Creating Conducive Environment on Learning Math in Tetriary Education

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Abstract. This study aims to create Basics Mathematics teaching materials for students who are assisted by online learning media called photomath android. Thus, it also aims to observe class environment created using this media. This research uses mixed method in which classes are given optimal treatment from aspects of personalization, involvement, intimacy, satisfaction, assignments, competition, innovation, individualization, source adequacy, and physical comfort. There is a significant difference between actual and preferred climate in the class. The treatments are carried out to improve the class environment in accordance with their respective indicators. The lecturer earnestly intervenes in improving the actual class environment like what students want (preferred). It shows that there are significant changes from the pre-test of actual class environment to its post-test which is better to bring the preferred class environment is much closer. The intervancy of the class environment resulted in the post-test was incerased to be 83%.

1. Introduction

Education is highly demanded to be better with the demands of the era [1]. That is why improving the learning process in the classroom can lead to quality education [2]. Thus, good human resources are created from qualified education, [3]. To achieve the creation of a conducive lecturing process, lecturers are recommended to create a good classroom atmosphere or classroom climate by using various strategies and methods in the lecturing process [4].

Classroom climate is a class condition in the lecturing process or classroom atmosphere [5]. All processes that occur in the classroom during the course of the study can be meant as a classroom climate that created within the processes [6].]. The classroom climate is characterized by interactions between students and lecturers or students with students in class [7]. Good classroom climates can lead to the ability to develop optimal competencies and skills for the students [8].

There are some factors that can create unconducive classroom climate such as lecturing process that focuses on students-to-students oriented only and learning process that makes students a passive learner [9]. There are also several factors that need to be considered in creating a conducive learning

process, for instance, the learning approach should be oriented to how students learn; there should be a lecturer award for active participation of students in each context; lecturers should be democratic in holding learning activities; every problem that arises in the learning process should be discussed dialogically; the classroom environment should be set up in such a way as to motivate the student in learning and encourage the learning process; provide various types of information resources that are related to various learning resources which can be learned or studied by the students [[10].

Moreover, mathematics is still considered as a difficult subject to be followed by the students [11]. Due to this reason, class conditions that evoke passion for enthusiasm to learn are needed among students [12]. In contrary, the atmosphere of the class at the university is very different from the one in the school where the students are required to expose the material or explain the material in learning [13]. Thus, what happened in the common class is the student receive material directly from the teacher during the learning process [14].

In short, a class climate that takes place in primary teacher education, faculty of education, Universitas Negeri Padang is very different. The class climate meant here is the atmosphere of the lecturing process. A good classroom climate is defined as a time when the students are active in the lecturing process [15]. This condition can be stimulated by emerging questions in the lecturing process, as well as requesting feedback from students-to-lecturers or students-to-students. They are required to master material and things related to lectures.

2. Method

This study was using a mixed method to obtain comprehensive research results [16]. According to experts, this research method was a method that was carried out by combining quantitative and qualitative research. Mixed methods were carried out to build synergies and strengths that exist between other quantitative and qualitative research methods to understand more complex phenomena [17]. It is also emphasized that in order to produce a better understanding of the problem of research, a combination of quantitative and qualitative methods was needed rather than using them separately.

The purpose of this method is to overcome the problems that exist in qualitative and quantitative methods. In addition, mixing several methods in one study has advantages, such as (a) increasing the reliability of study; (b) increasing the credibility of the findings and recommendations of the study; and (c) involving data from various sources such as questionnaires, interviews, observation, and documentation. To carry out mixed research methods, researchers must identify the design of mixed research methods like collecting, analyzing, and reporting data[18]. Based on the objectives and problems of this study, the researchers used a sequential exploratory design. It combines qualitative and quantitative research methods by combining the two methods in a row. In addition, the first stage to be done using qualitative methods and preceded the second level using quantitative methods for a wider sample [19].

Therefore, an interview was given to see the ability to solve math problems. This ability must be mastered by the students in Basics Mathematics subject. Interpretation of All Results of Quantitative Analysis. Quantitative Data Analysis. Data Collection Making Qualitative Questionnaires. Qualitative Data Analysis. Data Collection Method. In addition to the interview, questionnaires were also administered. The interview form was used to get answers from respondents in a qualitative manner. On the other hand, the questionnaire was used to obtain respondents' answers quantitatively. The first stage was identifying aspects of the ability to answer mathematical questions through interviews. In conducting interviews, the researchers needed to listen carefully and recorded what was stated by the respondents. This technique allowed the researchers to investigate more deeply, explore new information, open up more space to see problems from different dimensions, get inclusive, precise and clear information. Data Collection Method The research tool that will be used is interview questions

and questionnaires. The interview form is used to get answers from respondents in a qualitative manner, while the questionnaire is used to obtain respondents' answers quantitatively.
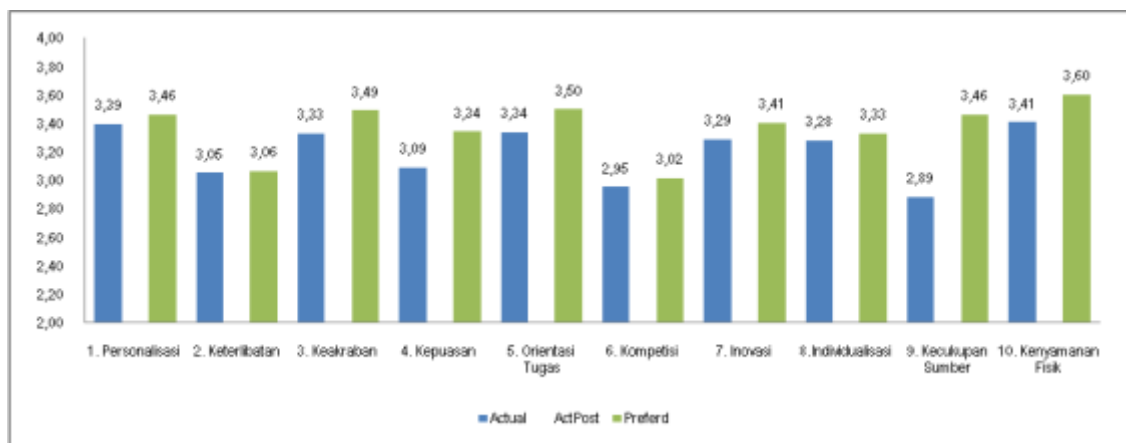
3. Results and Discussion

3.1 Results

The results of data measurement analysis of classroom climate in college that compared actual and preferred climate can be seen in the following sections.

3.1.1 Experimental class

The result of the data analysis to compare the actual climate and preferred climate can be seen in the following graph.

Graph 3.16 Actual and preferred classroom climate on Basic Mathematics subject

The graph showed that there was a difference between the actual and preferred classroom climate on the scale of familiarity, satisfaction, task orientation, source adequacy, and physical comfort. However, these differences were not noticeable.

Then, by referring to the differences, the lecturers conducted a remedial treatment to improve the classroom climate, more specifically on the scale of familiarity, satisfaction, and task orientation. After that, the results of the class climate improvement after a remedial treatment was drawn in the following graph.
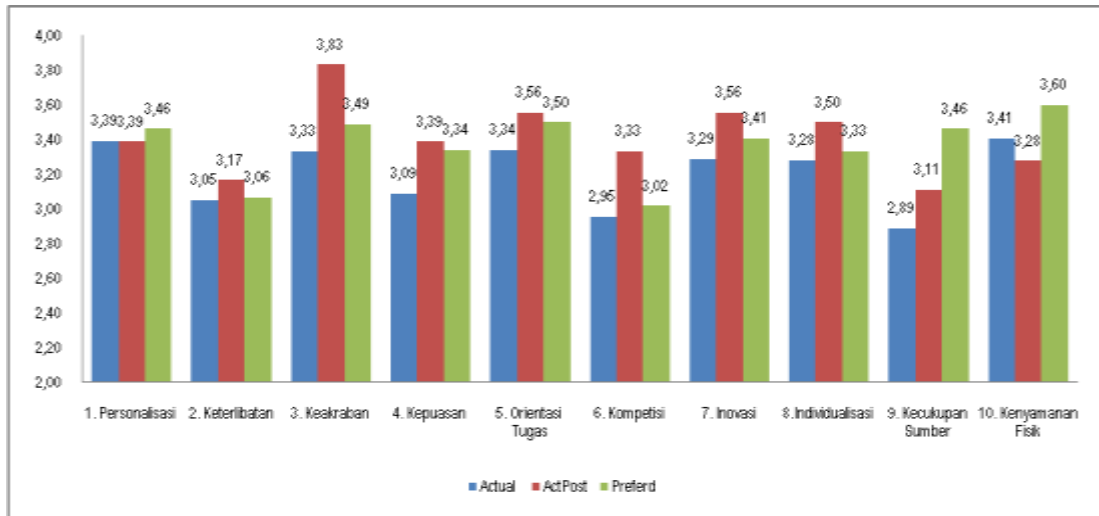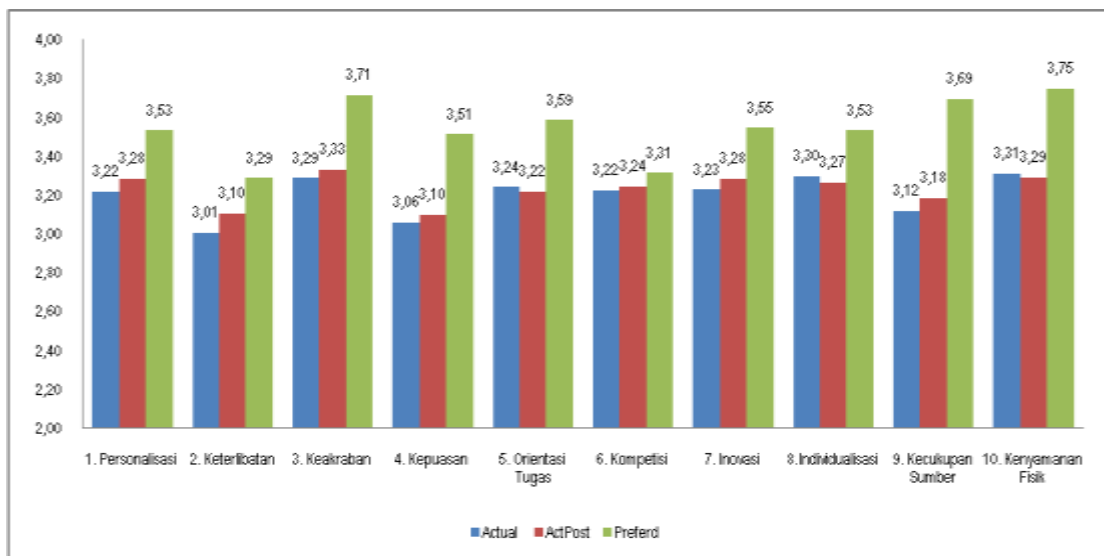
Graph 3.17 *Actual* (Pre-test dan Post-test) and *Preferred classroom climate* on Basic Mathematics subject

Concerning the graphs above, it can be stated that an intervention could improve classroom climate score in the post-test. This improvement appeared almost on all scales of the classroom climate. Hence, the score was above students' expectations the preferred climate score. Thus it can be said that the treatments carried out by the lecturers were able to change the classroom climate better than students' expectation.

3.1.2 *Control class*
The control class was a class without treatment. The comparison scales of the Actual Pre-test, Post-test and Preferred climate for the control class was drawn in the following graph.

Grafik 3.18 *Actual* (Pre-test and Post-test) and *Preferred classroom climate* on Basic Mathematics subject

The graphic showed that there were quite significant differences on almost all scales in the actual and preferred classroom climate. There was almost no significant difference between the actual classroom

climate on the pre-test and the post-test. This fact indicated that even though there was a desire from the students to have more conducive classroom climate if the lecturer did not conduct treatment to make the classroom climate better, there would be no change in improvement.

4. Discussion

The results of this study indicated that the actual classroom climate was generally lower than the preferred classroom climate from the students. These differences can be seen in ten classroom climate scales. The scale of familiarity, satisfaction, innovation, adequacy of sources, and physical comfort, for example, were scales that can be ascertained to have quite high differences between actual and preferred classroom climate. This condition was a concern of the teaching for lecturers and researchers to improve the classroom climate to make students become more familiar and satisfied with the implementation of classroom learning. The efforts to improve the scale of familiarity and satisfaction can be done by the lecturers by their own approach, methods, and tips respectively. For other scales, such as the adequacy of resources and physical comfort, the lecturers or researchers were unable to do this because the two scales were the domain of superiors and policymakers.

5. Conclusions

In conclusion, there are several scales that consistently occur in each class in which the preferred classroom climate is higher than the actual classroom climate. The scales that consistently get higher score are the scale of involvement, familiarity, satisfaction, innovation, source adequacy, and physical comfort. The difference between actual and preferred classroom climate on these scales is said to be significant.

The last, the scale of the source adequacy and physical comfort are two scales which are generally highly preferred compared to actual climate. The policymakers have a very important role to make and reduce these gaps by carrying out concrete activities to increase the number of sources and physical comfort for the students in the learning process.

6. References

[1]   Z. Wu, A. Ahlström, B. Smith, J. Ardö, and L. Eklundh, "Climate data induced uncertainty in model-based estimations of terrestrial primary productivity Climate data induced uncertainty in model-based estimations of terrestrial primary productivity," 2017.

[2]   A. U. Khan, J. Jiang, P. Wang, and Y. Zheng, "Influence of watershed topographic and socio-economic attributes on the climate sensitivity of global river water quality Influence of watershed topographic and socio-economic attributes on the climate sensitivity of global river water quality," 2017.

[3]   J. Kalin, C. Peklaj, S. Pečjak, M. P. Levpušček, and M. V. Zuljan, "Elementary and Secondary School Students ' Perceptions of Teachers ' Classroom Management Competencies Pogledi učencev osnovnih in srednjih šol na učiteljeve kompetence vodenja razreda," vol. 7, pp. 37–62, 2017.

[4]   A. Grundstein, J. Durkee, J. Frye, T. Andersen, and J. Lieberman, "A Severe Weather Laboratory Exercise for an Introductory Weather and Climate Class Using Active Learning Techniques," vol. 30, pp. 22–30, 2011.

[5]   K. S. Mcneal, J. M. Spry, R. Mitra, and J. L. Tipton, "Measuring Student Engagement , Knowledge , and Perceptions of Climate Change in an Introductory Environmental Geology Course," vol. 667, pp. 655–667, 2014.

[6]   V. Damme, D. Fraine, V. Landeghem, and D. Fraine, "Factors affecting Mathematics achievement of first-year secondary school students in Central Uganda," vol. 35, no. 3, pp. 1–16, 2015.

[7]   H. Terry, "Teacher Creativity and School Climate," vol. 226, no. Icss, pp. 708–710, 2018.

[8]   "Advances in Social Science, Education and Humanities Research (ASSEHR), volume 158 International Conference on Teacher Training and Education 2017 (ICTTE 2017)," vol.

158, no. Ictte, pp. 583–588, 2017.

[9]   R. Utari and M. Sutapa, "The Differences of Emphasis Among Teachers , Students and Parents Concerning School Climate," vol. 14, pp. 406–411, 2016.

[10]   J. X. Li and Y. Qi, "An Evaluation of Classroom Climate in the Computer-assisted Language Teaching," no. Itms, 2015.

[11]   R. Kramer, H. Schellen, and J. Van Schijndel, "Energy impact of ASHRAE ' s museum climate classes : a simulation study on four museums with different quality of envelopes," *Energy Procedia*, vol. 78, pp. 1317–1322, 2015.

[12]   R. P. Kramer, H. L. Schellen, and A. W. M. Van Schijndel, "Impact of ASHRAE ' s museum climate classes on energy consumption and indoor climate fluctuations : Full-scale measurements in museum Hermitage Amsterdam," *Energy Build.*, vol. 130, pp. 286–294, 2016.

[13]   S. Alm and S. B. Låftman, "Children and Youth Services Review Future orientation climate in the school class : Relations to adolescent delinquency , heavy alcohol use , and internalizing problems," *Child. Youth Serv. Rev.*, vol. 70, pp. 324–331, 2016.

[14]   S. Tram and O. Madsen, "ScienceDirect ScienceDirect ScienceDirect ScienceDirect Commissioning Learning Platform Manufacturing A models for capacity optimization Trade-off," *Procedia Manuf.*, vol. 23, no. 2017, pp. 93–98, 2018.

[15]   S. Syahril and H. Hadiyanto, "Improving School Climate for Better Quality Educational Management," *J. Educ. Learn. Stud.*, vol. 1, no. 1, pp. 16–22, 2019.

[16]   S. H. I. Dequan, "Study on Effect of Mixing Process on Green Sand Properties Based on Orthogonal Experimental Method," no. Mems, pp. 693–696, 2012.

[17]   A. Hasan, Rochmadi, H. Sulistyo, and S. Honggokusumo, "Rubber mixing process and its relationship with bound rubber and crosslink density," *IOP Conf. Ser. Mater. Sci. Eng.*, vol. 213, no. 1, 2017.

[18]   C. Series, "The Significant Effects of Communication Activities in the Co-Curricular Towards Reducing Shyness Amongst Elementary School Children The Significant Effects of Communication Activities in the Co- Curricular Towards Reducing Shyness Amongst Elementary Scho," 2018.

[19]   W. Wahyu and R. S. Syaadah, "The Effectiveness of Problem-Based Learning Approach Based on Multiple Intelligences in Terms of Student ' s Achievement , Mathematical Connection Ability , and Self-Esteem The Effectiveness of Problem-Based Learning Approach Based on Multiple Intelligenc."

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