

Classroom Management based on Ergonomic Aspects in Supporting Learning in Elementary Schools

Alifah Dian Titisari¹, Honest Umami Kaltsum^{2,*}

Faculty of Teacher Training and Education, Universitas Muhammadiyah Surakarta, Surakarta, Indonesia

Abstract

Purpose: Managing the classroom is one of the teacher's efforts in organising and designing the classroom to create a conducive learning environment. The objectives of this research are as follows: (1) To determine the implementation of classroom management by paying attention to ergonomic aspects in elementary schools; (2) Assessing teachers' understanding of classroom management based on ergonomic principles in learning; (3) Knowing the obstacles faced by teachers and students in managing classrooms to support learning.

Methodology: This research uses qualitative methods through a case study. The data collection techniques used were interviews, observation, and documentation. This research was carried out in Third-Grades of Muhammadiyah PK Baturan Elementary School. The data analysis used is thematic analysis, which involves reading through a set of data and looking for patterns of meaning in the data to find themes.

Results: The research results show that: (1) Classroom management is a supporting factor in creating conducive and effective learning. There needs to be special attention paid to ergonomic aspects consisting of lighting, thermal conditions, student seating arrangements, and noise. (2) Teachers need to increase their knowledge and understanding of the role of ergonomics in learning. This can be seen from the teacher's role in managing the class and students so as to create an ideal learning climate. (3) Obstacles in managing classes based on ergonomic principles in learning are felt by teachers and students to hinder their teaching and learning activities.

Applications/Originality/Value: This research reveals that educators need to understand ergonomic classroom management in supporting learning in order to achieve learning objectives.

Introduction

According to Law Number 20 of 2003 concerning the National Education System, it is stated that education is a conscious and planned effort to create an active learning atmosphere by developing students' personal potential. This is done to ensure that students feel comfortable with the teaching and learning process, so that they can master the lessons well (Habe, 2017).

One factor that can influence the learning atmosphere in elementary schools is the condition of the classroom. A class is defined as a part of the school system, functioning within a subsystem of the total school structure. Classes must be managed in such a way as to be dynamic, effective, and productive during the teaching and learning process. Classroom management involves various activities aimed at fostering desired student behavior, reducing undesirable behavior, improving relationships between individuals, creating a positive social and emotional climate, and maintaining a productive and effective class (Dwitama et al., 2023). So classrooms need to be designed as well as possible, with attention paid to various factors, such as classroom management, which has an impact on the quality of learning as part of the ergonomics approach. Therefore, the teacher's role is very important in managing and creating an effective and comfortable classroom environment.

Teachers should be able to manage the class so that they can encourage students to learn and support the learning process. According to previous research, it states that "the teacher's role in creating a comfortable classroom so that learning objectives are achieved well is to provide facilities and arrange all forms of spatial layout, including seating and classroom decorations. Apart from that, teachers also play a role as organisers and supervisors (Mutiarames et al., 2021). Various efforts that can be made to create a pleasant classroom environment for students include arranging students' desks and chairs in different ways, using school furniture to create an artistic impression, and using the classroom walls as a place to convey lesson messages.

Based on the Minister of National Education Regulation (Permendiknas) Number 40 of 2008, it is stipulated that buildings used for learning activities must meet several requirements: (1) have appropriate air circulation and lighting; (2) can reduce noise or vibrations that interfere with learning activities; (3) have the right room temperature; and (4) windows

* Corresponding author: huk172@ums.ac.id

must be equipped with lighting in accordance with the provisions for carrying out learning activities. It can be said that the room provided for teaching and learning activities takes into account various aspects, one of which is paying attention to the effectiveness of learning and student performance as part of an ergonomic approach, namely lighting, noise, room temperature, and spatial arrangement (Herwanto et al., 2018).

Ergonomic classroom management can help balance work needs with students' abilities, allowing them to learn comfortably, safely, healthily, and efficiently. Ergonomics is a field that investigates human safety and comfort and how they interact to adapt to their environment (Hasimjaya et al., 2017). In this way, the learning process can be balanced with classroom conditions. The existence of ergonomics in the learning environment is one way to optimise learning, as well as try to improve safety, comfort, and effectiveness of learning in the learning environment, including learning tools and equipment (Praherdhiono et al., 2016). According to (Azizah & Isnaini, 2023), ergonomic control is very important to increase students' concentration and their comfort while studying. So that learning ability and learning can be measured more accurately, tools are needed that make the learning environment more comfortable for students. These abilities can also be defined as qualities that enable students to carry out an activity.

The classrooms at Muhammadiyah PK Baturan Elementary School, specifically classroom III, are a place for teaching and learning activities (KBM). Third-Grades is on the second floor of the three floors of the school building. Muhammadiyah PK Baturan Elementary School itself is located in an urban area with low soil fertility, so it can be said that the environmental conditions tend to be high. Even though there is one air conditioning (AC) unit, the air circulation produced by the AC cannot be equal. Students who are far from the AC tend to feel hot, causing discomfort, while students who sit near the AC feel the air is very cold. This condition is made worse by the lack of circulation or windows for air to come in and out.

The problem that arises in Third-Grades is that the seating arrangement is less effective. The seating arrangement used is in a "U"-shaped sitting position where they face the teacher in the middle, so that all students have the same interaction distance from each other. Unfortunately, this sitting position causes noise and disruption to friends while studying. In addition, it is difficult for students to do small amounts of group work, and this can have a negative impact on student learning outcomes (Al-Kansa et al., 2023).

The next ergonomic aspect is regarding lighting. Lighting in the Muhammadiyah PK Baturan Elementary School classroom only relies on two lamps installed on the ceiling of the room. Unfortunately, in this classroom, there is minimal natural lighting coming from outside. This lighting is considered inadequate compared to the size of the classroom, which has 31 students.

Through this research, researchers conducted an analysis of classroom management based on an ergonomics approach to supporting learning in elementary schools, which is in accordance with the scope of educational research in elementary schools. The conditions that have occurred so far at Muhammadiyah PK Baturan Elementary School regarding measurements related to ergonomic aspects, which include thermal conditions (temperature), lighting, seating design, and noise in classrooms, have never been carried out, so efforts to analyse classrooms as a form of support in learning cannot yet be determined. Among the conditions above, teachers must be able to know and understand classroom management by paying attention to the ergonomics approach in elementary schools as an educator's effort to understand the quality of learning in the school environment.

Various relevant research reports report that through ergonomics, negative impacts on the use of science and technology can be avoided. In this case, (Mustika & Sutajaya, 2016) reported that through ergonomics, diseases caused by work, accidents, pollution, toxins, and human errors can be avoided. In contrast to what was observed (Herwanto et al., 2018), observing the learning environment in the computer room, which is one of the learning support facilities, does not meet the ergonomic aspect. So as a researcher, he suggested that schools review several actions to improve air temperature conditions, air ventilation, and indoor lighting. Actually, ergonomics make the study room a comfortable place to study. This means that human energy can be used for learning activities and is not wasted because it has to be in an ergonomic learning environment. The suitability of one aspect of ergonomics can be seen in the researcher's report (Septiana & Wijayanto, 2021), which reports that with seating management, which is one aspect of ergonomics, students' focus and activeness increase rapidly and benefit teachers by making it easier to reach students.

Therefore, this research aims to: (1) understand the implementation of classroom management by paying attention to ergonomic aspects in elementary schools; (2) assess teachers' understanding of classroom management based on ergonomic principles in learning; and (3) know the obstacles faced by teachers and students in managing classrooms to support learning.

Research Methods

The type of research used is qualitative, where in this approach the researcher emphasises an in-depth explanation of a problem rather than looking at general problems (Al-Kansa et al., 2023). Researchers will describe how classroom management is based on an ergonomics approach as a support for learning in elementary schools. The approach is carried out through case studies, where researchers carry out in-depth exploration of processes, activities, or one or more subjects. A case study is a series of scientific activities carried out in detail and intensely to obtain in-depth knowledge about the condition (Mudjia Rahardjo, 2017). Case studies are a powerful tool in qualitative research because they allow researchers

to explore phenomena in depth and understand their context. This is especially useful in uncovering the complex details of unique cases.

The research location is at Muhammadiyah PK Baturan Elementary School, which is in accordance with the research focus. The research object is the third-grade classroom at Muhammadiyah PK Baturan Elementary School. The research subjects involved included participating teachers, namely the homeroom teacher at Muhammadiyah PK Baturan Elementary School, as well as the person in charge of school infrastructure. The data that will be collected and obtained is about classroom conditions based on ergonomic aspects, including classroom lighting conditions, thermal conditions or temperature, student seating design, and noise. The other data is the teacher's understanding of classroom management based on ergonomic aspects. Meanwhile, the data source in a study comes from the data collection itself. So, the source of the researcher's data is obtained from the research subjects. Apart from that, the data source used comes from a literature review that is traced from various books, journals, and articles as a theoretical basis that can supporting the research topic.

Interviews, observation, and documentation are the data collection methods used in this research. Creswell describes qualitative research as an investigation or approach that aims to identify and understand a main phenomenon (Raco, 2010). Researchers ask general and broad questions to participants to understand these central symptoms. Data collection was carried out through interviews with teachers or homeroom teachers at Muhammadiyah PK Baturan Elementary School to find out the condition of the classrooms, how teachers deal with problems related to classroom management, and the extent to which teachers understand ergonomic aspects of learning. Then the classroom observation technique was carried out through careful observation and review at the research location, namely the classroom III of Muhammadiyah PK Baturan Elementary School. To obtain data or information from various written sources such as transcripts, books, letters, documentation, and so on, you can use research techniques in the form of documentation studies.

The data analysis used in this research is thematic analysis. This method is used to analyse qualitative data, which involves reading through a set of data and looking for patterns in the meaning of the data to find themes. In the initial stage, researchers transcribe the results of data collection into text that can be analyzed. The next step is to categorise the data into relevant themes or categories, such as lighting, seating arrangement, and temperature. Then the data that has been selected according to the research focus will be presented in the form of written descriptions related to classroom management based on an ergonomics approach in elementary schools. Researchers also identified teachers' views on ergonomic aspects of classroom management. The final stage carried out is drawing conclusions based on the findings from the data analysis. The conclusions that will be discussed are regarding how to manage classrooms from an ergonomics perspective. Apart from that, conclusions will also be drawn regarding teacher participation and the obstacles faced in classroom management based on ergonomic aspects in elementary schools. Researchers will also compare the findings with existing literature to strengthen their conclusions. Using quotes or case studies from data is also needed to support conclusions so that it can provide concrete data about how ergonomic aspects are in managing classrooms in elementary schools.

Results and Discussion

Implementation of Classroom Management at Muhammadiyah PK Baturan Elementary School

The initial step in collecting data was carried out through observation of Third-Grades at Muhammadiyah PK Baturan Elementary School. Observations were carried out in general in Third-Grades, both in terms of physical conditions including classroom cleanliness, air control, temperature and noise, and classroom decoration, as well as non-physical conditions such as the condition of students and teachers. Researchers see that overall, the classroom conditions are good, but they need to pay attention to certain things related to ergonomic aspects for a conducive learning atmosphere. Below, we will present the results of the data findings obtained through observations in Third-Grades classrooms.

Table 1. Third-Grades Inventory Data

Inventory Type	Quantity (Pieces)	Condition
Table	32	Good
Chair	32	Good
Whiteboard	1	Good
AC	1	Good
Lamp	2	Good
Projector	1	Good
Cleaning tool :		
Broom	2	Good
Rubbish bin	1	Good

Based on the data analysis in Table 1, it is found that classroom management based on school facilities has been well utilised by teachers and students. This can be seen in the proper management of tools so that they do not cause obstacles

to learning. Apart from that, observations made by researchers regarding the use of classrooms have been used optimally. The condition of the classroom, which is used as a place for learning, as a forum for teacher involvement with students and between students, as well as being a means of collaboration, discussion, interaction, and accommodating learning styles, is used as evidence that the teacher has maximised the classroom. In addition, the opinion of the Third-Grades teacher who conducted an interview said that "the classroom is used as a place for learning. With this classroom, we can apply learning according to the goals we want to achieve." According to him, classroom management is important because it will affect the quality of learning, so there is a need for teaching strategies in classroom management. The importance of classroom management agrees with (Mularsih & Hartini, 2019) who state that the classroom is the main learning environment that is created based on student awareness.

Efficient classroom management can be measured by the comfort level of students, one of which is through ergonomic analysis. Ergonomics comes from Greek, where the word *ergon* means "work" and *nomos* means "rule". Ergonomics is the art, science, and technology of harmonising tools, ways of working, and human abilities so that the work environment and workplace become safe, comfortable, and efficient (Mustika & Sutajaya, 2016). Apart from improving physical well-being, ergonomics generally aims to improve social well-being through improving the quality of social contacts, better management, and a rational balance between various economic, technical, anthropological, and cultural elements in every work system carried out, thereby improving the quality of work and life (Masruri & Patradhiani, 2019). Ghozali also believes that in carrying out work activities, there is a need for a comfortable and quiet place, so to help focus on this, it is necessary to create a comfortable workplace atmosphere and situation (Ghozali & Rizqiyana, 2022). One way is to know and understand it through ergonomics, which is the science of balancing tools, methods, and work environments so that they are safe, comfortable, and avoid accidents when doing work. So it can be concluded that ergonomics is a science that considers environmental design to suit human needs and comfort in this context, namely students.

Furthermore, the influence of the environment in this case, namely the classroom, includes temperature, air circulation, lighting, and noise. The following is an explanation of the principles of the physical work environment in the classroom for learning activities, namely lighting, air circulation, noise, seating layout, and its suitability to the existing conditions at Muhammadiyah PK Baturan Elementary School.

Lighting

The conditions that occur in Third-Grades show that there are two medium-sized lamps in the middle of the room, so they can spread throughout the room. But unfortunately, the lighting is only supported by lamps without any possible light ventilation. The classroom only relies on one door for entry and exit. If the door is opened during the learning process, it will cause a glare in the students' view. Glare can reduce the eye's ability to see and cause discomfort. Parts of the field of view that are too bright compared to the general lighting level at the location cause glare in the eyes.

When designing school facilities and infrastructure, classroom lighting must be considered. Lighting is the condition or level of lighting in a room or environment. According to the Decree of the Minister of Health of the Republic of Indonesia No. 1429/MENKES/SK/XII/2006, schools must meet lighting standards in classrooms, namely 200 to 300 lux. If the light used when studying in class is not up to standard, it is feared that it will cause fatigue in students' eyes (Sutarnitri et al., 2021). Therefore, it is important to pay attention to lighting so that learning activities can run safely and comfortably.

Through adequate lighting, a person can see objects clearly. Several principles of good lighting can be explained as follows: (1) the level of lighting is adjusted to the person's type of work, vision, and environment; (2) the display size is at 100% vision; (3) efficient vision, security, comfort, and safety need to be considered in designing lighting; (4) the minimum lighting standard is 200 lux; and (5) the lighting prioritises work, background, and environment (walls, roofs, floors, etc.) (Mustika & Sutajaya, 2016).

Based on the lighting aspect of the classroom, students experience learning difficulties indirectly. The Third-Grades teacher stated that the students experienced problems when carrying out writing activities. This happens because the light in the room is not evenly distributed, so students need to adjust their sitting position to suit their perspective. One of the reasons this condition can occur is because ergonomic rules have not been paid attention to, thus causing an adverse physiological response, namely the appearance of eye fatigue.

Thermal Conditions

Third-Grades room conditions related to thermal conditions or temperature show that there is an air conditioning (AC) unit placed on the west wall of the classroom. The classroom does not have open ventilation for incoming and outgoing air exchange. This condition worsens the thermal quality (temperature) of the classroom. The room only relies on one main door, without any windows or natural circulation. In addition, the current global warming conditions have resulted in prolonged droughts in a number of regions in Indonesia. " According to the Head of the Meteorology, Climatology, and Geophysics Agency (BMKG), the hot temperature in Indonesia is predicted to reach up to 40 degrees Celsius. "This is caused by two factors that make a number of areas in Indonesia hot, including the dry drought phenomenon aka El Nino and the apparent movement of the sun," quoted from CNN Indonesia 2023 online news. This has an impact on the high temperatures that occur at Muhammadiyah PK Baturan Elementary School, with temperatures reaching 30 degrees Celsius during the day.

Thermal conditions, or what is usually called air temperature, are related to the conditions of air circulation or ventilation in a room. The air condition in a room is influenced by various factors such as temperature, surface, air humidity, movement, and air quality. Meanwhile, factors that cause a feeling of comfort in the thermal conditions (temperature) of a room are changes in weather, humidity, type of clothing, building location, location of greenery, and use of air conditioning (Rohman et al., 2021). One factor that can increase productivity in education is the thermal comfort of the room. An object that is hot and the energy it wastes can cause discomfort for people in the room (Muhaimin et al., 2023).

Various factors related to increasing room temperature can cause various losses for students, including increased fatigue, increased heart rate, increased blood pressure, decreased digestive system function, increased body temperature, and an increased amount of sweat released. This condition describes the discomfort caused by the hot room temperature during the learning process. So there is a need for awareness and for schools to pay attention to classroom design that refers to ergonomic standards. Therefore, students spend all their energy on learning activities rather than improving uncomfortable room conditions. Teachers can use their knowledge to design comfortable learning spaces that do not cause unwanted physiological reactions.

Seating Layout

Based on observations made by researchers at Muhammadiyah PK Baturan Elementary School Third-Grades, researchers observed the students' seating positions, cleanliness and beauty, layout of learning tools, classroom decoration, and teacher mobilisation in the learning process. Students sit in a row towards the back, while the teacher's desk is located in front of the students. A blackboard is placed on the wall in the middle of the classroom. Teaching tools such as hero pictures, creation boards, class rules, picket schedules, class structures, and clean corners are posted on the classroom walls with such a concept. At the left end of the classroom, there is a place to collect cleaning tools, making it easier for students to carry out picket duties.

Meanwhile, the teacher's role in this case includes two main points, namely teaching and managerial processes (Septiana & Wijayanto, 2021). Classroom managerial activities aim to ensure that teaching and learning activities take place effectively and efficiently. Teachers are responsible for creating and maintaining a comfortable classroom environment and dealing with disturbances if they occur. So teachers play an important role in determining class conditions, especially in terms of seating arrangements. Based on the results of the interview, the researcher found that the teacher had given two treatments to the students' seating positions. The teacher's first step is to change the students' seats into a U shape. This treatment actually creates an improvement in the classroom atmosphere, which tends to be busy. The class atmosphere became easily noisy, and several students sitting on the side benches had difficulty looking at the blackboard. This U-shaped seating makes it easier for teachers to observe and supervise students during the learning process, but from the students' point of view, this seating shape will only trigger commotion because the children are close together.

Based on class conditions, the teacher provides the second treatment, namely changing the shape of the students' seats so that they are lined up backwards. Changes in classroom conditions become more focused, and teachers' reach can be evenly distributed. This makes it easier for students to ask the teacher about their lack of understanding. As students become more active in ongoing learning, class effectiveness also increases. Apart from that, this form of seating also reduces the noise generated by students. Teachers can also monitor students easily, and the class seems wider than before.

Regarding these differences, it can be concluded that in arranging student seating, various changes can be made in accordance with the teacher's teaching strategies and methods (Zuldafrial, 2012). Therefore, it is necessary to have a teacher's role in managing the class in an effort to create classroom situations and conditions that are effective and ergonomic in managing students' places.

Classroom Noise

Unwanted, even annoying sounds can cause ear damage on a regular basis, which is known as noise. Noise is considered a psychological concept that is manifested in unwanted sounds and is considered a cause of stress (Widiastuti, 2006). The noise data for this research was obtained from observations of sound disturbances heard in the classroom. These sounds can come from inside the room or from outside the room, such as the sound of students talking or the sound of electronic devices operating. Based on the results of observations and interviews, the noise range in classrooms tends to be low. This only comes from inside the classroom, namely the noise of the students themselves. Students tend to be busy when they feel bored or when the weather is hot, which causes discomfort.

The teacher's strategy for overcoming these obstacles is to modify the learning area outdoors. Students can study outside of class periodically to reduce boredom. Classroom noise should not exceed 35 dBA and 55 dBA in all parts of the classroom (Eko Poerwanto, 2014). Meanwhile, the observation data measured the noise level during the day, namely 32.4 dBA, which complies with the standards for noise in classroom management ergonomics.

Based on research carried out at Muhammadiyah PK Baturan Elementary School, it was found that teachers have managed the classroom well but have not paid maximum attention to the ergonomic aspects of the classroom. The existence of good management can be seen in the ergonomic aspect of the arrangement of work tools in the form of student tables and chairs. The teacher has carried out various treatments, namely changing the shape of the seating to create comfort for students. The same thing can also be seen in the aspect of classroom noise, where the teacher minimises noise interference

from outside and inside. However, it is necessary to review aspects of lighting and the thermal conditions (temperature) of the class because this is still the teacher's homework in overcoming the obstacles that arise. There are similarities in the results between researchers and previous research in that school management needs to take various actions to improve air temperature conditions and indoor lighting (Herwanto et al., 2018). There needs to be intervention from the school and the entire school community regarding the solution to this condition. Efforts to improve ergonomics that have been carried out by teachers at Muhammadiyah PK Baturan Elementary School regarding ergonomic management are felt to be able to increase financial profits and increase safety and comfort in the workplace. In other words, if ergonomics is implemented correctly and appropriately, it can produce greater economic benefits.

Teachers' Understanding of Classroom Management Based on Ergonomics Principles

According to data gathered by researchers through interviews with the homeroom teacher at Muhammadiyah PK Baturan Elementary School, teachers did not know about or comprehend the ergonomic aspects of learning. However, teachers already understand learning strategies and analyze the classroom environment, paying attention to lighting, thermal conditions, noise, and student seating arrangements. It's just that these aspects have their own obstacles and problems, so each aspect needs special treatment. This is proven by the management of classrooms that have been designed in such a way and adapted to the needs and conditions of students. However, the teacher's role in managing classroom ergonomics is a priority in learning.

A teacher is an individual who plays an important role in education and learning. If the teacher manages the class well and successfully applies the lessons, the learning objectives will be achieved. Yanti (2011) argues in a quote (Mutiarames et al., 2021) that one of the teacher's main responsibilities is to create a classroom atmosphere that allows teaching and learning interactions, which can then encourage students to learn well and seriously. It is stated that classroom management is an art in which teachers work to make the classroom atmosphere comfortable, effective, and enjoyable for students. Here are some of the teacher's roles in learning:

Create a positive learning environment

The learning environment is one where students feel safe, encouraged, and supported in their development. An optimal school environment is a school climate that is sensitive to the needs of each student so that it can increase their personal and academic growth (Widyaningrum & Mahmudah, 2019). In the opinion of the Third-Grades teacher at Muhammadiyah PK Baturan Elementary School, the way he creates a positive learning environment is by creating fun learning for students. "Well, if the child is happy, the learning can be managed flexibly, so we want to manage the class depending on the intelligence and creativity of the teacher." This means that when students feel comfortable with the teacher and the environment, it can be easier to manage the class and create a positive learning environment. This agrees with experts that in teaching and learning activities, teachers play a role in controlling the learning climate (Yestiani & Zahwa, 2020). It can be said that the teacher becomes the captain who takes the ship to a comfortable and safe destination. The same thing was also reported in Esmaeili (2015) research, which was quoted in (Minsih & D, 2018) that each student has unique characteristics, and creative teachers will use the right approach by looking at the differences in each student. Giving the right rewards and punishments at the right time can make learning fun and create a pleasant classroom atmosphere.

Manage classes

Based on observations made by researchers, the teacher has planned the physical layout of the classroom, including the arrangement of tables and chairs, blackboards, and use of storage space. An orderly and organised space can help maintain discipline and efficiency in learning. The teacher has also organised the creation of clear rules and norms of behaviour in the class. These rules include rules, ethics, and consequences for breaking the rules.

Facilitator (teaching and guiding students)

A teacher acts as a facilitator, namely helping students learn easily and understand what is being taught. Teachers act as mentors, facilitators, and helpers in the student learning process. In this role, teachers strive to facilitate student-centred, active, collaborative, and meaningful learning experiences. The condition that occurs at Muhammadiyah PK Baturan Elementary School is that teachers have encouraged students to take initiative in their own learning, such as taking responsibility for their learning, helping them plan goals, and solving problems. Teachers have also actively involved students in learning. These can take the form of group discussions, collaborative projects, experiments, and activities that require student participation.

The results of research on the understanding and role of teachers at Muhammadiyah PK Baturan Elementary School regarding classroom management based on several aspects of ergonomics that have been observed in learning have similarities in research (Mustika & Sutajaya, 2016) that: (1) teachers do not yet know, understand, and understand the principles of ergonomics that can be used as guidelines or standards in managing facilities and infrastructure as well as

learning processes; (2) teachers already know aspects of ergonomics but ignore the applicable standards because they prioritise the priority role in learning, which consists of creating a positive learning climate, class manager, and facilitator.

Obstacles for Teachers and Students in Managing an Ergonomic Class

Based on the results of observations and interviews at Muhammadiyah PK Baturan Elementary School regarding classroom management, teachers and students experienced several obstacles. One of these obstacles is the condition of students, which is difficult to manage. This becomes an obstacle for teachers in managing learning. One of the factors that causes difficulties in managing Third-Grades students is that Third-Grades is a transition from the lower class to the upper class, namely class IV in elementary school, so that this stage is the beginning of the child's adaptation to the next phase.

The next obstacle is the small size of the classroom. It can be seen from the researcher's observations that the room, which tends to be small, must be used for 31 students and one teacher. Usually, the classrooms at Muhammadiyah PK Baturan Elementary School are only used by around 20 students. This creates a learning climate that is not ergonomic, such as hot temperatures, noise, and a lack of lighting. Apart from that, ergonomic study room design is also neglected due to considerations of cost and time involved. This is due to the assumption that incorporating ergonomics rules will result in increased costs.

The teacher's ignorance of the effects brought about when learning does not adhere to ergonomic principles is another barrier that teachers face. As explained in the discussion of teacher understanding above, teachers prioritise their role in teaching and put aside their role in managing the class in accordance with existing comfort standards. This will clearly affect students' lack of concentration when learning.

Apart from teachers and students, the constraints regarding ergonomic classroom management are also felt by schools, where they often do not have innovative, proactive, and productive teachers to apply ergonomics in learning, so that the very relevant principles of ergonomics cannot be applied. Schools also do not carry out routine evaluations of the learning process related to ergonomic classroom management. This is one of the reasons why ergonomic principles in the classroom are not given maximum attention in supporting learning in elementary schools.

Based on several obstacles, classroom management requires special strategies for learning. This strategy can take the form of understanding the teacher's role in managing the classroom and its influence on how to teach and behave in the classroom and in society. Teachers who understand their position and function as professional educators are always encouraged to grow and develop their education (Khotimah & Sukartono, 2020). The need for teachers who are competent in the field of ergonomics is something that must be considered in order to be able to manage the classroom safely, comfortably, effectively, and efficiently. The school's role in reviewing learning implementation is also needed so that regular evaluations can avoid obstacles that arise in classroom management.

Conclusion

Based on the results of the analysis, it can be concluded that classroom management at Muhammadiyah PK Baturan Elementary School has been carried out well, namely the management of seating and room noise has been managed in such a way as to create a conducive and effective learning climate. However, special attention needs to be paid to ergonomic factors, particularly lighting and thermal conditions in the classroom, as they pose significant obstacles to learning. Teachers' knowledge and understanding of the role of ergonomic principles is not yet fully understood, so there are several ergonomic principles that are not in accordance with existing standards. Through teachers' understanding of learning and the effects of ergonomic aspects, it is hoped that they can improve their classroom management skills. Obstacles to implementing classroom management based on ergonomic principles in learning can be felt by teachers and students. The solution based on the researchers' analysis is that to avoid significant costs or unnecessary expenses, ergonomics must always be considered when designing or redesigning a learning space. As well as the need for teachers who are professional and competent in the field of ergonomics so they can manage the classroom safely, comfortably, effectively, and efficiently. The hope is that this can be a challenge as well as an opportunity for implementing ergonomic schools so that they can support learning optimally.

Acknowledgement

I praise and thank God Almighty, because with His blessing and grace, I was able to complete this research. This scientific paper was written to fulfill the requirements for obtaining a bachelor's degree in elementary school teacher education at the Faculty of Teacher Training and Education, Muhammadiyah University of Surakarta. I realised that without help and guidance from various parties, it would be quite difficult for me to complete it. Therefore, I would like to thank Mrs. Honest Umami Kaltsum, S.S., M.Hum. as supervisor; Mr. Hervian Prasetyo, M.Pd as principal of Muhammadiyah PK Baturan Elementary School; and Mrs. Lia Defi Hastuti, S.Pd as Third-Grades teacher at Muhammadiyah PK Baturan Elementary School. The author realises that in writing this scientific paper, there are still shortcomings. For this reason, constructive criticism and suggestions are expected to improve this scientific paper.

References

- Al-Kansa, B. B., Agustini, S., & Pertiwi, P. I. (2023). Pengaruh Penataan Tempat Duduk Terhadap Keefektifan Belajar Siswa Sekolah Dasar. *Jurnal Pendidikan Dan Konseling*, 5(1), 683–687. <https://doi.org/https://doi.org/10.31004/jpdk.v5i1.10860>
- Azizah, C. P. N., & Isnaini, R. L. (2023). Membangun Kerangka Konseptual Ergonomi dalam Manajemen Sarana dan Prasarana Pendidikan. *Jurnal Akuntabilitas Manajemen Pendidikan*, 11(1). <https://doi.org/https://doi.org/10.21831/jamp.v11i1.58162>
- Dwitama, D. B. D. P., Hasibuan, E. G. E., Zahara, F., Munthe, M. S. E., Juniza, P., Arianda, F. T., & Damayanti, N. (2023). Analisis Hubungan Pengelolaan Kelas Dengan Motivasi Belajar Siswa Di Sekolah Dasar. *Jurnal Pendidikan Dan Konseling*, 5(1), 1215–1218. <https://doi.org/https://doi.org/10.31004/jpdk.v5i1.11134>
- Eko Poerwanto. (2014). Evaluasi Faktor Kebisingan Ruang Kuliah Di STTA pada Gedung Halim Perdana Kusuma Dan Abdurahman Saleh. *Angkasa*. <http://eprints.sta.ac.id/id/eprint/49>
- Ghozali, M., & Rizqiyana. (2022). Ergonomic of School Facilities and Infrastructure to Support Effective Schools. *Jl. Marsda Adisucipto No. 1 Yogyakarta*, 1, 62–274. <https://sunankalijaga.org/prosiding/index.php/icrse/article/view/776>
- Habe, H. (2017). Undang-Undang Republik Indonesia Nomor 20 Tahun 2003 tentang Sistem Pendidikan Nasional. *JDIH Kementerian Pariwisata Dan Ekonomi Kreatif*, 2(1), 39–45. <https://doi.org/10.24967/ekombis.v2i1.48>
- Hasimjaya, J., Wibowo, M., & Wondo, D. (2017). Kajian Antropometri dan Ergonomi Desain Mebel Pendidikan Anak Usia Dini 3-4 Tahun di Siwalankerto. *INTRA*, 5(2), 449–459. <https://publication.petra.ac.id/index.php/desain-interior/article/view/5858>
- Herwanto, D., Nugraha, A. E., & Kusnadi. (2018). Kajian Aspek Ergonomi pada Laboratorium Komputer untuk Meningkatkan Kenyamanan Belajar Siswa. *Jurnal Teknologi Rekayasa*, 3(1), 1. <https://doi.org/10.31544/jtera.v3.i1.2018.1-10>
- Khotimah, A. K., & Sukartono. (2020). Strategi Guru dalam Pengelolaan Kelas pada Pembelajaran Tematik di Sekolah Dasar. *Jurnal Basicedu*, 6(3), 3(2), 524–532. <https://doi.org/https://doi.org/10.31004/basicedu.v6i3.2940> ISSN
- Masruri, A. A., & Patradhiani, R. (2019). Faktor Ergonomi Terkait Kenyamanan Ruang Kelas Fakultas Teknik Universitas Muhammadiyah Palembang. *Integrasi : Jurnal Ilmiah Teknik Industri*, 4(1), 40. <https://doi.org/10.32502/js.v4i1.2097>
- Minsih, & D, A. G. (2018). Peranan Guru Dalam Pengelolaan Kelas. *Profesi Pendidikan Dasar*, 5. <https://doi.org/10.24252/lp.2010v13n2a6>
- Mudjia Rahardjo. (2017). Studi Kasus dalam Penelitian Kualitatif : Konsep dan Prosedurnya. *Reseaech Repository Universitas Islam Negeri Maulana Malik Ibrahim*, 1–14. <http://repository.uin-malang.ac.id/1104/>
- Muhaimin, M., Jumriani, Alviawati, E., & Angriani, P. (2023). Urgensi Kenyamanan Termal dalam Perspektif Pembelajaran. *Geodika: Jurnal Kajian Ilmu Dan Pendidikan Geografi*, 7(1), 23–32. <https://doi.org/10.29408/geodika.v7i1.6451>
- Mularsih, H., & Hartini. (2019). Pengelolaan Ruang Kelas dalam Rangka Meningkatkan Keefektifan Pembelajaran di Pkbn Insan Cendikia. *Jurnal Bakti Masyarakat Indonesia*, 2(1), 15–21. <https://doi.org/10.24912/jbmi.v2i1.4312>
- Mustika, P. W., & Sutajaya, I. M. (2016). Ergonomi Dalam Pembelajaran Menunjang Profesionalisme Guru Di Era Global. *JPI (Jurnal Pendidikan Indonesia)*, 5(1), 82. <https://doi.org/10.23887/jpi-undiksha.v5i1.8933>
- Mutiaramses, M., S, N., & Murni, I. (2021). Peran Guru Dalam Pengelolaan Kelas Terhadap Hasil Belajar Siswa Sekolah Dasar. *Pendas : Jurnal Ilmiah Pendidikan Dasar*, 6(1), 43–48. <https://doi.org/https://doi.org/10.23969/jp.v6i1.4050>
- Praherdhiono, H., Degeng, I. N. S., Setyosari, P., & Sulton. (2016). Instrumen Kenyamanan Lingkungan Belajar Berbasis Ergonomi. *Jurnal Pendidikan Dan Pembelajaran*, 23(1), 38–45. <http://journal.um.ac.id/index.php/pendidikan-dan-pembelajaran/article/view/10150>
- Raco. (2010). Metode Penelitian Kualitatif Jenis, Karakteristik dan Keunggulannya. In Arita (Ed.), *PT Grasindo*. <https://osf.io/mfzuj/>
- Rohman, A. S., Nurbaiti, U., & Fianti. (2021). Analisis Kenyamanan Suhu Ruang. *Jurnal Enviro Scientea*, 17(2), 21–29. <https://ppjp.ulm.ac.id/journal/index.php/es/article/view/11346/7290>
- Septiana, V., & Wijayanto, S. (2021). *The Role of Student Seating Layout in Managing Class Atmosphere in Bunda*

Wacana Elementary School Peran Tata Letak Tempat Duduk Siswa Dalam Mengelola Suasana Kelas di Lingkungan Sekolah Dasar Bunda Wacana. 16–20.
<http://repository.urecol.org/index.php/proceeding/article/download/1724/1690/>

- Sutarnitri, N. P. D., Citrawathi, D. M., & ... (2021). Perbaikan Pencahayaan Ruang Kelas Menurunkan Kelelahan Mata dan Kebosanan Belajar Peserta Didik pada Pembelajaran Biologi di SMA. *Jurnal Pendidikan ...*, 7, 164–172.
<https://ejournal.undiksha.ac.id/index.php/JJPB/article/view/31716>
- Widiastuti, I. (2006). Tinjauan Prinsip-Prinsip Ergonomi dalam Perbaikan Sarana Pembelajaran di Prodi Pendidikan Teknik Mesin UNS. *Performa*, 5(1), 87–92. <https://jurnal.uns.ac.id/performa/article/download/11614/10292>
- Widyaningrum, K. N., & Mahmudah, F. N. (2019). Kreasi Iklim Sekolah Melalui Gerakan Sekolah Menyenangkan Di SD Muhammadiyah Mantaran. *Profesi Pendidikan Dasar*, 6(2), 115–128.
<https://doi.org/10.23917/ppd.v1i2.9259>
- Yestiani, D. K., & Zahwa, N. (2020). Peran Guru dalam Pembelajaran pada Siswa Sekolah Dasar. *Fondatia*, 4(1), 41–47.
<https://doi.org/10.36088/fondatia.v4i1.515>
- Zuldafrial. (2012). *Strategi dan Pendekatan Pengelolaan Kelas*. Yuma Pustaka.