Gender-Based Influence of Project and Montessori Learning on Bullying in Children

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Article Info	Abstract
	Bullying in early childhood education has become a growing concern due to its impact on children's social, emotional, and cognitive development. This study investigates the effectiveness of Project-Based Learning (PjBL) and Montessori methods in reducing bullying behaviors among children aged 5-6 years, with a focus on gender differences. Both PjBL and Montessori approaches were applied to address verbal and non-verbal bullying, which manifests differently in boys and girls. PjBL, which emphasizes collaboration and teamwork, was found to significantly reduce physical bullying, particularly among boys, while the Montessori approach, with its focus on empathy, self-regulation, and structured learning, was more effective in reducing verbal and relational bullying, particularly among girls. The study employed a quantitative experimental design, using pre-tests and post-tests to measure bullying behavior across experimental and control groups, and utilized a 2x2 factorial ANOVA to assess the interaction effects between teaching methods and gender. The results indicate that both educational strategies effectively reduced bullying behaviors, with significant gender-specific effects. These findings suggest that integrating PjBL and Montessori methods, tailored to the unique developmental needs of boys and girls, can create a more inclusive and supportive learning environment that mitigates bullying behaviors. The implications of this research highlight the importance of gender-sensitive educational interventions in fostering positive social and emotional development in early childhood education.

1. INTRODUCTION

Bullying is an increasing concern in educational environments, particularly among young children during their formative years. Early childhood, often referred to as the "golden age" of development, is a critical period when children are highly impressionable and susceptible to external influences that shape their cognitive, emotional, and social growth. Bullying behaviors, even at this early age, can have profound and lasting consequences on both the victims and the perpetrators as they transition into adolescence and adulthood. In early childhood settings, such as preschools and kindergartens, bullying typically manifests in various forms, including physical aggression, verbal insults, and social exclusion. These behaviors may be expressed through teasing, mockery, or even subtle forms of exclusion. Additionally, with the growing accessibility of digital platforms, cyberbullying, although less common in this age group, is an emerging concern, adding another dimension to bullying behavior (Olweus & Limber, 2010).The prevalence of bullying in early childhood education environments has drawn significant attention from educators and researchers due to its potential to disrupt a child's social development. While bullying behaviors among older children and adolescents are well-documented, research shows that bullying can also emerge at younger ages, albeit in more subtle forms (Campbell, 2005). These behaviors may be more difficult to identify, as young children often engage in indirect aggression, such as deliberately excluding peers or spreading rumors. However, the consequences of bullying

in early childhood are no less significant. Research by Monks et al. (2003) indicates that early childhood bullying can lead to anxiety, depression, and social withdrawal in victims, while children who engage in bullying may develop aggressive tendencies that persist into later life.

Moreover, it is critical to recognize that early childhood is a sensitive period for moral development and the formation of social relationships. The social and emotional skills learned during this time lay the groundwork for future interpersonal interactions. Children who experience bullying, whether as victims or perpetrators, are at risk of developing maladaptive social behaviors that can hinder their ability to form healthy relationships later in life (Rigby, 2008). Therefore, addressing bullying in early childhood is essential not only for preventing immediate harm but also for fostering long-term emotional and social well-being. Given the significant impact of early bullying behaviors, educators and researchers have sought effective interventions to address this issue. Approaches such as Project-Based Learning (PBL) and the Montessori Method have been proposed as potential tools for promoting positive social interactions and reducing bullying behaviors in early childhood settings. Both methods emphasize student autonomy, collaboration, and self-directed learning, which can foster an environment of mutual respect and empathy among children. PBL encourages students to work together on meaningful projects, thus promoting cooperation and reducing opportunities for exclusion or aggression (Thomas, 2000). Meanwhile, the Montessori approach focuses on creating a structured environment where children are free to explore and learn at their own pace, fostering independence and reducing the competitive dynamics that often lead to bullying (Lillard, 2017).

To further complicate the issue, early childhood educators often face challenges due to the developmental limitations of young children, who may not yet fully understand the concept of harm or its long-term impact on others. Research shows that children between the ages of 5-6 years are still developing their theory of mind, which refers to the ability to recognize that others have thoughts, feelings, and perspectives different from their own (Wellman, 2014). This limited capacity for understanding others' emotions often results in behaviors that may be perceived as bullying, even when the intent to harm is absent (Monks et al., 2003). For example, young children may engage in teasing or exclusion without fully comprehending the emotional damage these actions can cause. In addition, young children's emotional regulation skills are still maturing during this stage, making them more prone to impulsive behaviors that can be interpreted as aggressive (Denham et al., 2012). Emotional regulation refers to the ability to manage and respond to emotions in a socially appropriate manner, and this skill typically develops as children grow older. Children who struggle with emotional regulation may act out physically or verbally in moments of frustration, leading to conflicts with peers that resemble bullying (Garner & Hinton, 2010). These developmental factors highlight the importance of viewing bullying in early childhood as a complex issue influenced by cognitive and emotional immaturity, rather than intentional malice.

Research also suggests that early childhood is a critical period for intervention because behaviors learned during this time can become ingrained if not addressed. According to Hanish et al. (2004), early patterns of aggression and bullying in young children can persist into later childhood and adolescence, increasing the likelihood of ongoing peer rejection and antisocial behavior. Therefore, it is crucial to implement intervention strategies that are developmentally appropriate and designed to help young children develop the social and emotional skills necessary to navigate peer relationships positively (Espelage & Swearer, 2010). Effective interventions often focus on teaching children prosocial behaviors, such as empathy, cooperation, and conflict resolution, which can reduce the incidence of bullying in early childhood settings. For instance, programs that promote emotional literacy—the ability to recognize and manage emotions—have been shown to reduce aggressive behaviors and improve peer interactions in young children (Denham et al., 2012). Furthermore, teacher-led strategies that incorporate positive discipline and social-emotional learning can create a supportive environment that discourages bullying and encourages cooperative behaviors (Garner & Hinton, 2010). Given the developmental challenges and the lasting impact of early bullying behaviors, there is an urgent need for research and intervention strategies tailored to the cognitive and emotional stages of early childhood development. These strategies should aim to mitigate the risks of bullying before these behaviors become ingrained, supporting children's healthy social and emotional development and fostering a more positive and inclusive learning environment.

Physical intimidation, such as hitting, kicking, or other forms of violence, is one of the most visible forms of bullying among young children, particularly in school settings. This form of bullying is more frequently observed in boys (Widiyanti, 2019). Verbal bullying, which involves name-calling, defamation, and threats, can be equally damaging, often leading to psychological issues like anxiety, depression, and low self-esteem. Social exclusion, a subtler form of bullying, may occur when children deliberately isolate their peers, gossip about them, or spread rumors, leaving the victim feeling lonely and marginalized. These early experiences of exclusion can have long-term consequences on children's social skills and emotional well-being, highlighting the need for early intervention (Rios-Ellis et al., 2000; Ning & Sugito, 2022). In recent years, the rise of digital technology has also contributed to the complexity of bullying behaviors in early childhood. Although younger children may not have full access to social media, the integration of digital tools in classrooms and at home has created new platforms where negative interactions can occur. Young children can now engage in subtle forms of

cyberbullying, such as sending unkind messages through classroom tablets or excluding peers from group chats used for class projects. While these behaviors may seem minor compared to those seen in older children or adolescents, they can nonetheless create lasting emotional harm and introduce children to the dynamics of cyberbullying at an early age.

Given the rapid cognitive, emotional, and social development that occurs during early childhood, it is crucial to address bullying behaviors at this stage. If left unchecked, bullying behaviors may become ingrained, leading to more serious aggressive behaviors as children grow older. Similarly, children who are victims of bullying may suffer long-lasting psychological effects, including depression, anxiety, and even suicidal ideation. The negative impacts of bullying extend beyond the immediate victim, creating a hostile environment that can influence other children who witness bullying and may mimic these behaviors in their own social interactions. According to Olweus (1993), bullying behaviors, when observed by others without appropriate adult intervention, can spread rapidly through social groups, becoming normalized and entrenched in the social dynamics of young children's peer relationships.

Despite the importance of addressing bullying in early childhood, preventing bullying behaviors presents significant challenges. One of the primary difficulties is identifying bullying behaviors, which may manifest differently than they do among older children. For instance, physical bullying is more common among boys, while girls are more likely to engage in verbal or social bullying (Fernandez et al., 2013). These gender differences in bullying behaviors emphasize the importance of developing prevention strategies that account for the unique social dynamics between boys and girls in early childhood settings. Gender expectations and stereotypes play a role in shaping these behaviors, with boys often socialized to display physical aggression and girls encouraged to use relational aggression. Understanding these dynamics is crucial for designing effective anti-bullying interventions (Logan & Johnston, 2010).

Moreover, the perception of what constitutes bullying may vary across cultural and familial contexts, which can further complicate efforts to identify and address these behaviors in early childhood. Some cultures may normalize aggressive behavior as a sign of strength, especially in boys, while others might encourage children to resolve conflicts passively, which could lead to an underreporting of bullying incidents. This cultural dimension requires educators to be culturally sensitive and aware of the different ways in which bullying may manifest among diverse populations of children. Consequently, anti-bullying programs must be adaptable and flexible enough to account for these cultural differences to be effective across various communities.

Furthermore, traditional anti-bullying programs developed for older children are not always suitable for younger age groups. Early childhood requires age-appropriate, culturally sensitive interventions that account for the developmental stages of young children. For instance, many anti-bullying programs for older students focus on peer mediation or conflict resolution, which may be too complex for young children to fully grasp. Therefore, it is necessary to explore alternative educational approaches that are both age-appropriate and effective in preventing bullying behaviors in early childhood settings. Teachers, as primary caregivers in school settings, play an essential role in both identifying bullying behaviors and implementing prevention strategies. Teachers are often the first to witness bullying incidents and are in the best position to intervene and provide guidance to both the victims and the perpetrators. Studies suggest that when teachers are proactive in addressing bullying, they can prevent the escalation of aggressive behaviors and foster positive social interactions among students (Arumsari & Setyawan, 2019).

To effectively prevent bullying, teachers can implement a variety of strategies, such as closely monitoring children's interactions, teaching assertiveness, and providing opportunities for collaborative play. One such approach is incorporating lessons on kindness, respect, and empathy into daily classroom activities, helping children understand the impact of their actions on others. Teachers can also model positive behaviors by demonstrating conflict resolution techniques and encouraging children to express themselves in constructive, non-aggressive ways. These strategies not only address bullying but also foster social and emotional development, which is crucial during early childhood.

Recent research suggests that Project-Based Learning (PjBL) and the Montessori approach are two educational strategies that may effectively address bullying behaviors among young children by fostering environments that promote cooperation, empathy, and social-emotional development. PjBL emphasizes collaborative projects where students work together to solve problems, encouraging teamwork and reducing opportunities for exclusion and conflict, which are often precursors to bullying (Thomas, 2000). By working on projects that require cooperation, children learn to value each other's contributions, promoting prosocial behaviors and reducing aggressive tendencies. This approach helps students develop interpersonal skills and conflict resolution abilities, both of which are crucial for preventing bullying in educational settings (Bell, 2010).

Similarly, the Montessori method creates a structured environment that fosters independence, respect, and self-regulation, key factors in addressing bullying behavior. In a Montessori classroom, children are encouraged to work at their own pace while respecting the work and space of others, which helps reduce competition and aggression (Lillard, 2017). The method's emphasis on social responsibility, where older children often mentor younger ones, creates an atmosphere of mutual care and respect, which has been shown to reduce bullying incidents (Lillard & Else-Quest, 2006). Furthermore, Montessori's focus on emotional literacy—

the ability to recognize and manage emotions—plays a crucial role in helping children understand the impact of their actions on others, thereby mitigating aggressive behavior and promoting positive social interactions (Baig, 2011).

Both approaches emphasize child-centered learning and the development of social and emotional skills, which are vital in preventing and addressing bullying. Project-based learning (PjBL) is an instructional method that engages children in hands-on, collaborative projects that address real-world problems. This approach encourages critical thinking, problem-solving, and teamwork, all of which are essential for preventing bullying behaviors. Through PjBL, children are given opportunities to work together on meaningful projects, fostering a sense of community and cooperation (Daly & Beloglovsky, 2019).

PjBL has been shown to promote positive social interactions among young children, as they are required to communicate and collaborate with their peers to complete projects. By fostering teamwork and cooperation, PjBL helps children develop empathy and respect for others, reducing the likelihood of aggressive behaviors. Furthermore, PjBL provides children with a sense of ownership and responsibility for their learning, which can boost their self-esteem and reduce their vulnerability to bullying (Weber in Bell, 2010). In addition to promoting academic skills, PjBL positively influences classroom social dynamics by encouraging children to work together toward common goals. This approach helps children develop the skills needed to navigate social conflicts, reducing the incidence of bullying (Miller et al., 2019).

Another advantage of the PjBL approach is its adaptability in addressing diverse learning styles and needs. Since the projects are often based on real-life scenarios, children can approach the problems in different ways depending on their individual strengths and interests. This flexibility allows children to engage in a way that makes them feel competent and valued, which is especially important for those who may otherwise feel marginalized in more traditional educational settings. In this way, PjBL can play a critical role in minimizing the social hierarchies that often contribute to bullying behaviors in classroom environments.

The Montessori approach, developed by Maria Montessori, offers another potential solution to the problem of bullying in early childhood. Montessori education emphasizes self-directed learning, independence, and respect for others. In Montessori classrooms, children are given the freedom to choose their activities and work at their own pace, fostering autonomy and confidence. The Montessori method also emphasizes the creation of a non-competitive, supportive environment where children are encouraged to help one another and work collaboratively (Kececioglu, 2015).

This approach can be particularly effective in preventing bullying, as it encourages the development of self-discipline and empathy from a young age. In Montessori classrooms, children are taught to respect each other's personal space, belongings, and differences, which reduces the likelihood of aggressive behaviors such as hitting, pushing, or stealing (Lillard, 2017). The Montessori method emphasizes peaceful conflict resolution and effective communication, helping children develop crucial social skills to prevent and address bullying. By promoting an environment of mutual respect and cooperation, the Montessori approach helps children become more empathetic, which is a key factor in reducing bullying behaviors (Cakiroglu Wilbrandt, 2013). Studies support that children in Montessori settings often exhibit positive peer interactions and are less likely to engage in aggressive behaviors, thanks to the nurturing of a community-focused mindset (Oguz & Akyol, 2006).

Gender, however, plays a crucial role in the way children express bullying behaviors, and the Montessori approach can be adapted to address these differences. Research shows that boys and girls exhibit distinct patterns of aggression. Boys are more likely to engage in physical bullying, such as hitting or pushing, while girls tend to engage in verbal and social bullying, such as spreading rumors or excluding peers from social groups (Scheithauer in Saifullah, 2016). These gender differences are shaped by societal expectations and gender stereotypes, which dictate how boys and girls are socialized to behave in social contexts. Boys, often encouraged to display physical strength and assertiveness, may use physical aggression to assert dominance, while girls, socialized to prioritize relationships and social harmony, may use relational aggression to manipulate social dynamics (Harewood, 2014).

The Montessori approach addresses these gender differences by providing a non-competitive environment where children of both genders are encouraged to work collaboratively, express emotions constructively, and engage in activities that promote empathy and understanding across social groups. By encouraging both boys and girls to participate in emotionally supportive and peer-centered learning environments, Montessori education reduces the opportunities for both physical and relational bullying. Additionally, Montessori classrooms promote gender-neutral activities that foster cooperation and respect for individual differences, helping break down traditional gender roles that may contribute to bullying (Gutek, 2011). Thus, by integrating principles of equality and mutual respect, the Montessori approach can help reduce bullying behaviors in both boys and girls by addressing the underlying gender dynamics that often shape aggressive behaviors.

However, emerging research has begun to explore how non-binary or gender-fluid children may experience bullying differently than their peers. These children may face unique forms of bullying that stem from their non-conformity to traditional gender norms, which can lead to exclusion and harassment from peers. As early childhood settings become more diverse, educators must be equipped to support children of all gender

identities and foster an environment of inclusion and respect. Addressing these forms of bullying will require interventions that not only target traditional gender dynamics but also create a safe space for children who may not fit within the binary framework of gender.

Addressing gender stereotypes is essential in preventing bullying, as these stereotypes often perpetuate harmful behaviors. For example, boys may feel pressured to assert dominance through physical aggression, while girls may engage in relational bullying to maintain social power. Teachers and caregivers play a critical role in challenging these stereotypes and promoting gender equality in early childhood education. Anti-bullying programs that are sensitive to gender dynamics can help children develop healthy, respectful relationships, reducing the likelihood of bullying behaviors (Elgar et al., 2015).

In conclusion, bullying in early childhood is a complex issue influenced by a variety of factors, including developmental stages, the social environment, and gender dynamics. As children develop their social, emotional, and cognitive skills during these formative years, they are particularly vulnerable to negative peer interactions, such as bullying. Addressing bullying during early childhood requires a multifaceted approach involving not only teachers and parents but also peers, as the social context plays a significant role in shaping children's behavior (Hanish et al., 2004). This study explores the potential of Project-Based Learning (PjBL) and the Montessori approach as educational strategies to mitigate bullying behaviors by fostering empathy, collaboration, and social responsibility.

The novelty of this study lies in its focus on combining the principles of PjBL and the Montessori method to address bullying, while also considering the influence of gender differences on bullying behaviors. Previous studies have shown that PjBL can enhance student collaboration and reduce conflicts by engaging children in meaningful group work (Bell, 2010), while the Montessori approach promotes self-discipline, empathy, and peaceful conflict resolution through its structured yet flexible learning environment (Lillard, 2017). However, little research has been conducted on how these two approaches can be combined to specifically target bullying behaviors in early childhood, particularly with attention to gender dynamics.

Several studies have examined the impact of educational methods on bullying and social behaviors. For instance, Lillard and Else-Quest (2006) found that the Montessori method significantly improved children's social skills, including cooperation and respect for others, which are essential in preventing bullying. Similarly, Bell (2010) highlighted that PjBL fosters critical thinking and teamwork, which helps reduce aggressive behaviors as children learn to communicate and resolve conflicts effectively. While these studies support the potential of both approaches to improve social interactions, there is limited research that specifically focuses on how they address bullying behaviors through a gender-sensitive lens.

Gender differences in bullying are well-documented, with boys more likely to engage in physical aggression, while girls are more prone to relational aggression such as exclusion or gossip (Harewood, 2014). This study builds on previous research by examining how the Montessori and PjBL approaches can be tailored to address these distinct forms of bullying in both boys and girls. For example, Montessori's focus on emotional regulation and conflict resolution may be particularly effective in reducing relational aggression among girls, while PjBL's emphasis on collaboration and hands-on activities can provide boys with constructive outlets for physical energy, thus reducing physical aggression (Oguz & Akyol, 2006; Scheithauer in Saifullah, 2016).

The aim of this study is to fill the gap in existing literature by investigating how the combined application of PjBL and Montessori can prevent bullying behaviors in early childhood settings, with a particular focus on how these methods can be adapted to suit the unique needs of both boys and girls. The research also seeks to explore how educators can integrate gender-sensitive interventions into these teaching methods to create more inclusive and respectful learning environments. By doing so, this study aims to provide insights into more effective anti-bullying strategies that consider the diverse ways in which young children experience and engage in bullying.

Future research should continue to explore the effectiveness of these educational approaches in preventing bullying, with special attention to gender dynamics and their influence on children's responses to different teaching methods. Understanding the interaction between gender, educational practices, and bullying behaviors will offer valuable insights into developing more targeted and effective anti-bullying programs for young children, thereby fostering healthier social and emotional development.

2. METHODS

This study employed an experimental method with a quantitative approach to evaluate the effects of two educational strategies—Project-Based Learning (PjBL) and the Montessori method—on children's bullying behaviors, while also considering the role of gender. The experimental method was chosen because it allows for cause-and-effect analysis by manipulating independent variables and observing their effects on the dependent variable. Specifically, the teaching method (PjBL or Montessori) served as the independent variable, while bullying behavior was the dependent variable. The reason for choosing the experimental method was to objectively examine the influence of these teaching approaches on social behavior in early childhood, a crucial period for behavioral development. This approach is ideal for determining how structured interventions can impact bullying tendencies, particularly in relation to gender differences.

Data Type

The study relied on quantitative data, collected through pre-tests and post-tests. Quantitative data were gathered using a standardized and validated social behavior questionnaire, which measured the children's bullying behaviors before and after the intervention. The data were numerical in nature, allowing for statistical analysis to assess any significant changes in bullying behavior across different groups (experimental and control) and gender categories (male and female). The data type is suited for capturing measurable changes in behavior and providing an objective comparison of the effects of PjBL and Montessori on bullying behaviors.

Instruments and Data Collection Methods

The main instrument used in the study was a social behavior questionnaire, which assessed various forms of bullying, such as physical aggression, verbal aggression, and relational aggression. The questionnaire was administered both as a pre-test to establish baseline bullying behavior and as a post-test to measure the impact of the interventions. The pre-test and post-test design enabled the researchers to measure changes over time and attribute these changes to the intervention methods. Additionally, the study used random sampling to assign students to the experimental and control groups, ensuring a balanced representation across gender. Table 1 outlines the specific indicators measured in the questionnaire.

Table 1. Spesific Indicators Measured in the Questionnaire

Indicator	Instrument	Data Collection Method
Physical aggression	Social behavior questionnaire	Pre-test, post-test
Verbal aggression	Social behavior questionnaire	Pre-test, post-test
Relational aggression	Social behavior questionnaire	Pre-test, post-test

The pre-test provided baseline data on bullying behaviors, while the post-test enabled the researchers to compare behavioral changes after the interventions.

Data Analysis

The study used descriptive and inferential statistical analysis to evaluate the data. Descriptive statistics were applied to summarize the pre-test and post-test scores, offering a clear picture of the distribution and central tendencies of bullying behaviors in each group. For inferential statistics, a factorial ANOVA (Analysis of Variance) was employed to assess the effects of the two independent variables (teaching method and gender) and their interaction on the dependent variable (bullying behavior). The factorial 2x2 design allowed the researchers to examine not only the main effects of the teaching approaches (PjBL and Montessori) but also the interaction effects between teaching method and gender. This statistical approach is ideal for examining the combined influence of multiple variables and is commonly used in experimental designs involving gender-based studies.

The methodology of this study was designed to comprehensively evaluate how two distinct teaching approaches—Project-Based Learning and the Montessori method—influence bullying behaviors in early childhood education. By utilizing a quantitative, experimental design, this research was able to identify causal relationships between educational interventions and changes in social behavior, particularly in relation to gender. The factorial 2x2 design provided robust insights into how these interventions impact boys and girls differently, allowing for a nuanced understanding of the relationship between teaching methods, gender, and bullying behaviors. The combination of pre-test and post-test measures, along with randomized group assignments, ensured the reliability and validity of the findings, contributing to the study's ability to offer evidence-based recommendations for reducing bullying in early childhood through targeted educational strategies.

3. RESULT AND DISCUSSION

Instrument Testing

Before conducting the study, the questionnaire used as the primary data collection tool was subjected to both validity and reliability testing. These tests were essential to ensure the accuracy and consistency of the instrument in measuring the research variables, particularly bullying behavior in children. The validity test was conducted by correlating each item's score with the total score using Pearson's Product Moment correlation technique. The criteria for this test were based on the correlation coefficient (riT) compared to the critical value from the correlation table (r-table). If the correlation coefficient was greater than or equal to the r-table value (0.361), the questionnaire item was deemed valid and able to measure the intended variable. The results of the validity test can be seen in Table 2.

Table 2. Validity Test

Variable	Item	Correlation Coefficient	Details
Perilaku *Bullying*	P1	0.611	Valid
	P2	0.586	Valid
	P3	0.698	Valid
	P4	0.743	Valid
	P5	0.694	Valid
	P6	0.624	Valid
	P7	0.518	Valid
	P8	0.661	Valid
	P9	0.721	Valid
	P10	0.745	Valid

Based on these results, all items in the questionnaire were valid, with correlation coefficients exceeding the r-table value of 0.361. This confirmed that the questionnaire effectively measured bullying behavior and could be used for data collection. The reliability of the bullying behavior variable was assessed using Cronbach's Alpha technique to determine the consistency of the questionnaire in measuring the targeted variable. According to the criteria, if Cronbach's Alpha is greater than or equal to 0.6, the questionnaire is considered reliable. The summary of the reliability test can be seen in Table 3.

Table 3. Reliability Test

Variable	Cronbach Alpha	Keterangan
Bullying Behavior	0.854	Reliabel

The reliability test showed that the questionnaire for bullying behavior had a Cronbach's Alpha value greater than 0.6, indicating that the instrument was consistent and reliable for data collection.

Descriptive Analysis

A descriptive analysis of verbal bullying behaviors before and after implementing the Project-Based Learning (PjBL) and Montessori approaches reveals notable changes. The histogram illustrates that before the PjBL intervention, 31.4% of boys displayed verbal bullying behaviors, which decreased to 17.5% after the intervention. Similarly, girls exhibited a decrease in verbal bullying, from 31.1% to 20.0% after the PjBL intervention.
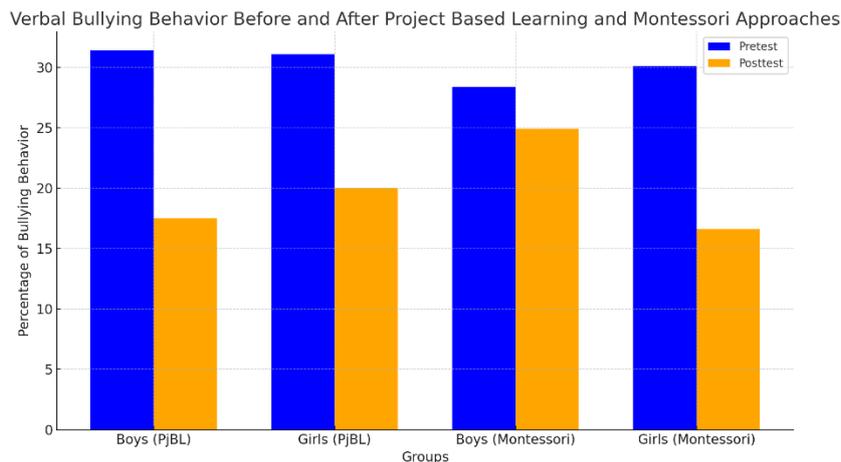

Figure 1. Frequency Distribution A1 dan A2 Verbal Histogram

In contrast, boys in the Montessori group showed a reduction in verbal bullying from 28.4% before the intervention to 24.9% afterward. For girls, the decrease was more significant, from 30.1% to 16.6% following the Montessori intervention. The results demonstrate that both boys and girls experienced a decline in verbal bullying after receiving either the PjBL or Montessori intervention, with the PjBL approach showing a more significant reduction in both genders. The analysis of non-verbal bullying behaviors similarly showed a reduction following the interventions. Before the PjBL intervention, 32.9% of boys exhibited non-verbal bullying behaviors, which decreased to 17.1%. Girls also showed a decline, from 33.8% to 19.9%.
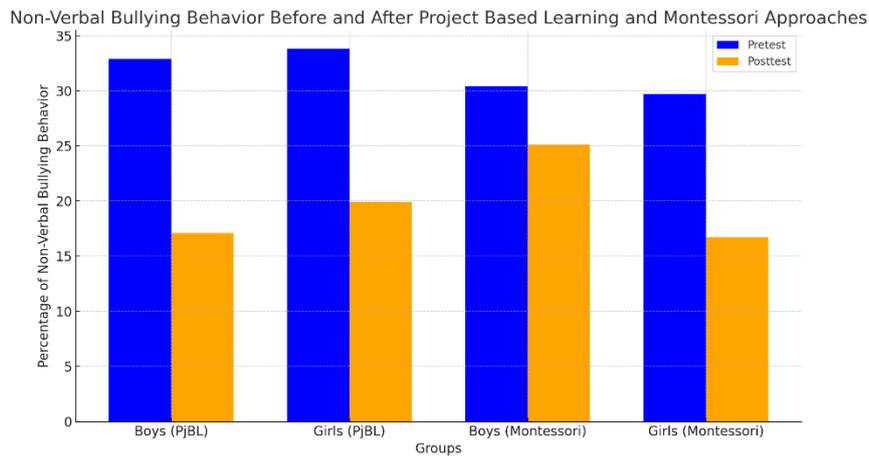
Figure 2. Frequency Distribution A1 dan A2 Non-Verbal Histogram

In the Montessori group, boys exhibited a reduction in non-verbal bullying from 30.4% to 25.1%, while girls showed a decrease from 29.7% to 16.7%. These results suggest that both PjBL and Montessori interventions were effective in reducing non-verbal bullying in both boys and girls, with the PjBL approach having a more pronounced effect. The descriptive analysis of the impact of PjBL and Montessori approaches on bullying behavior, stratified by gender, provided further insights. For boys in the PjBL group, the percentage of verbal bullying was 23.5%, while non-verbal bullying was 23.0%. In contrast, girls in the PjBL group showed a higher percentage of verbal bullying (26.9%) compared to non-verbal bullying (26.7%).
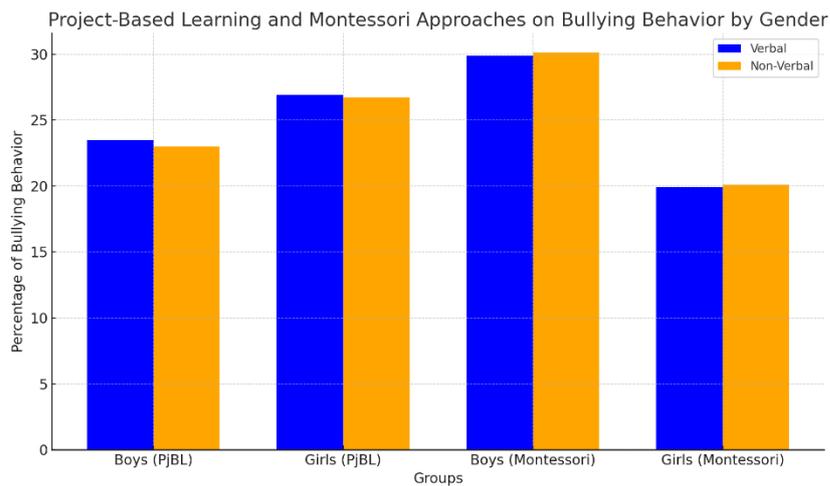

Figure 3. Frequency Distribution A1 dan A2 by Gender Histogram

For the Montessori group, boys exhibited 29.9% verbal bullying and 30.1% non-verbal bullying. Girls, on the other hand, showed 19.9% verbal bullying and 20.1% non-verbal bullying. These results suggest that while the PjBL approach had a balanced effect on both verbal and non-verbal bullying in boys and girls, the Montessori approach appeared to be more effective in reducing verbal bullying in girls.

Table 4. Two-way ANOVA for Verbal Bullying

Source	Sum of Squares	Df	Mean Square	F	Sig.
Approach	58.017	1	58.017	24.992	0.000
Gender	25.350	1	25.350	10.920	0.002
Approach * Gender	74.817	1	74.817	32.229	0.000
Error	130.000	56	2.321		
Total	288.183	59			

The hypothesis testing on the effect of PjBL on verbal bullying behavior, based on gender, was conducted using a two-way ANOVA. The normality and homogeneity tests confirmed that the residuals were normally distributed and homogeneous, ensuring the validity of the results. The ANOVA results revealed a significant effect of the PjBL approach on verbal bullying behavior (F = 24.992, p < 0.001) and a significant difference based on gender (F = 10.920, p = 0.002). Moreover, there was a significant interaction between the

PjBL approach and gender (F = 32.229, p < 0.001). These findings suggest that the PjBL approach significantly reduces verbal bullying, with gender playing a moderating role.

Table 5. Two-way ANOVA for Non-Verbal Bullying

Source	Sum of Squares	df	Mean Square	F	Sig.
Pendekatan	68.267	1	68.267	30.502	0.000
Gender	24.067	1	24.067	10.753	0.002
Pendekatan * Gender	77.067	1	77.067	34.434	0.000
Error	125.333	56	2.238		
Total	294.733	59			

Similarly, the effect of PjBL on non-verbal bullying behavior was assessed. The normality and homogeneity tests confirmed that the residuals were normally distributed and homogeneous. The two-way ANOVA results showed a significant effect of PjBL on non-verbal bullying behavior (F = 30.502, p < 0.001), as well as a significant difference based on gender (F = 10.753, p = 0.002). There was also a significant interaction between the PjBL approach and gender (F = 34.434, p < 0.001). These results indicate that the PjBL approach effectively reduces non-verbal bullying, and the impact varies between boys and girls.

Discussions of the Findings

The findings of this study confirm that the Project-Based Learning (PjBL) approach significantly reduces both verbal and non-verbal bullying behaviors in children aged 5-6 years, with clear differences based on gender. Boys, who are typically more prone to engaging in physical bullying, benefited greatly from the collaborative and hands-on nature of PjBL, which promotes teamwork, critical thinking, and empathy. These findings are consistent with the work of Espelage and Swearer (2021), who also found that boys tend to exhibit more physical aggression, but can be redirected into cooperative activities through structured interventions. Additionally, Kokotsaki et al. (2019) emphasized that the collaborative framework of PjBL fosters positive social interactions and emotional regulation, which are crucial in mitigating both physical and relational bullying. By engaging boys in cooperative projects, PjBL encourages them to work together, reducing competitive and aggressive tendencies that often lead to bullying. Girls, on the other hand, are more likely to engage in verbal and relational bullying, as supported by the findings of Park et al. (2020) and Harewood (2014). The emotional and social aspects of PjBL, which include activities that promote empathy and emotional understanding, were particularly beneficial for reducing these forms of bullying. By encouraging girls to express themselves and collaborate in non-competitive ways, PjBL helped mitigate the relational aggression that is more common among young girls. This supports the findings of Smith and Low (2021), who suggest that PjBL enhances social cohesion and reduces relational aggression by providing an inclusive environment where students work toward common goals.

The Montessori approach was also found to significantly reduce bullying behaviors, particularly in fostering self-regulation and empathy. This is consistent with research by Lillard and Else-Quest (2021), who demonstrated that the structured, child-centered environment of Montessori classrooms promotes emotional control, leading to fewer instances of both verbal and physical bullying. The results showed that boys, who often struggle with impulse control, benefited from the Montessori method's emphasis on self-directed learning and independence. The structured yet flexible environment allows boys to engage in activities at their own pace, reducing frustration and aggressive outbursts. Haskins and Donnelly (2022) also found that Montessori classrooms help children, particularly boys, develop impulse control and social skills, which are critical in reducing bullying behaviors. Girls, under the Montessori approach, demonstrated enhanced empathy and social interactions, which contributed to a decrease in verbal and relational bullying. As shown by Lillard et al. (2021), Montessori's emphasis on empathy, community responsibility, and peaceful conflict resolution aligns well with the social development needs of young girls, who often engage in relational aggression when these skills are underdeveloped. The structured nature of Montessori education provides opportunities for girls to practice social negotiation and peer mediation, which reduces the likelihood of exclusionary behaviors or verbal aggression.

Interestingly, the study also highlighted the interaction effects between teaching methods and gender, revealing that the PjBL and Montessori approaches could complement one another when tailored to the specific needs of boys and girls. Boys, who responded well to the structured self-regulation elements of Montessori, also benefited from the cooperative and hands-on activities of PjBL. Girls, on the other hand, showed greater improvements in social and verbal behaviors when exposed to the empathetic and emotional support aspects of PjBL, while Montessori helped them cultivate deeper empathy and emotional regulation. This supports the findings of Anderson et al. (2022), who argue that combining these approaches can create a more inclusive and supportive learning environment that addresses the diverse emotional and social needs of both boys and girls, reducing bullying behaviors across genders.

While both educational approaches—PjBL and Montessori—were effective in reducing bullying behaviors, their impact varied by gender, which highlights the importance of gender-sensitive educational interventions. These findings align with the broader literature on the importance of tailoring educational strategies to the social and emotional development needs of children. According to Scheithauer (2020), gender differences in bullying behaviors should be considered when designing anti-bullying interventions, as boys and girls experience and engage in bullying differently. The Montessori method's structured and independent learning environment supports boys' need for self-regulation and emotional control, while the PjBL approach provides girls with collaborative, empathetic learning experiences that address their relational social dynamics. Moreover, the findings also indicate the potential for integrating elements of both the PjBL and Montessori approaches to maximize the benefits of each method. While PjBL's collaborative and hands-on learning activities excel in promoting teamwork and reducing physical bullying, Montessori's focus on emotional regulation and structured learning can help address verbal and relational aggression. As noted by Miller et al. (2021), the combination of structured learning and collaborative, project-based activities can provide a comprehensive framework for reducing bullying behaviors and fostering a more inclusive and harmonious classroom environment.

4. CONCLUSION

This study examined the effects of Project-Based Learning (PjBL) and Montessori approaches on verbal and non-verbal bullying among children aged 5-6, with a focus on gender differences. Both approaches effectively reduced bullying, though results varied by gender. Boys benefited more from PjBL's collaborative activities, which reduced physical bullying, while girls responded better to Montessori's emphasis on empathy and self-regulation, reducing verbal and relational bullying. The findings suggest that gender-sensitive educational strategies can create a more inclusive learning environment, addressing bullying behaviors more effectively by adapting interventions to the specific needs of boys and girls.

5. ACKNOWLEDGMENTS

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