
Final Exams and Their Effects on the Development of Primary School Students

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Abstract

This research aimed to analyze the effect of final exams on the development of sixth graders in primary school. The ex post facto method was employed in this research to identify and analyze the causal relationship between final exams and various aspects of student development. The researchers purposively sampled, considering student characteristics pertinent to the research objectives. The researchers analyzed the collected data descriptively to paint a clear and detailed picture of students' conditions before, during, and after final exams. The results showed diverse student conditions relevant to their overall development, including cognitive, emotional, social, and physical aspects. These findings highlight the importance of paying attention to the holistic condition of students during the exam period, not just focusing on academic results alone. Proper and comprehensive support during this period is essential to ensure optimal and sustainable student development.

Keywords

Final exams, primary school, sixth graders, student development.

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Introduction

Primary education is an essential stage in a child's development, where they acquire academic basics and build physical and motor foundations that will affect their health and quality of life. Physical fitness and motor skills play a crucial role in a child's physical development, directly impacting on their ability to participate in daily activities, sports, and academic performance (Strong et al., 2005). Therefore, physical education should be considered a complement to the curriculum and an integral part of supporting children's holistic development.

Recently, there has been increasing attention to primary school-age children's physical fitness and motor skills. This shift is due to the increasing prevalence of sedentary lifestyles and lack of physical activity in children, which can harm their long-term health (Tremblay et al., 2011). The World Health Organization (WHO) recommends that children engage in moderate to high-intensity physical activity for at least 60 minutes daily to support healthy growth (WHO, 2020). However, the reality on the ground shows that many children do not reach this standard, especially in school environments that place more emphasis on academic achievement than physical activity.

In Indonesia, primary education is often focused on core academic subjects, especially for 6th graders who face final school exams. A packed curriculum and the pressure to achieve high academic results often lead to less time for physical activity, both in and out of school. As a result, students lack opportunities to develop their physical fitness and motor skills optimally. Research has shown that excellent physical fitness improves cognitive function, concentration, and student learning outcomes (Donnelly et al., 2016). Thus, the balance between academic education and physical activity must be a significant concern in the education system.

Research also shows that children with excellent motor skills tend to be more physically active throughout their lives, positively impacting their overall health (Barnett et al., 2008). Conversely, lacking motor skills can lead to low exercise confidence and an increased risk of obesity and other health problems (Robinson et al., 2015). At the primary education level, final-year primary school students, especially grade 6 students, face challenges in fitness and skills. This issue has become increasingly important as students prepare for busy final exams (Habiby, 2013). The effectiveness of educational learning in schools has been reduced. A more profound understanding of final-year primary school students' fitness levels and skill abilities becomes critical. Implementing final school exams in Indonesia is a high priority in the primary education curriculum (Ministry of Education and Culture, 2019). Sixth graders must focus on exam preparation, which often leads to an emphasis on core academic subjects (Harahap et al., 2022), which are often ignored or neglected altogether. As a result, final-year primary school students experience a significant decline in fitness levels and skill abilities. Primary school is an important stage in a child's development, where they acquire the educational

foundations and skills to shape their future (Komaini et al., 2022).

One of the important aspects of child development is physical fitness and motor skills. However, current phenomena show that final-level primary school students, especially 6th graders, face low fitness and skills challenges. We need to understand how the busy schedule of final school exams affects students' fitness and skills. Physical education and physical activity are important components in the holistic development of students at the primary school level (Ospankulov et al., 2022). Through physical activity, students can improve physical fitness, motor coordination, and social and cognitive skills (Chan et al., 2022). In this context, $VO_2\text{max}$ (the body's maximum oxygen capacity) and motor educability are relevant factors to explore. Fitriani et al. (2023) and Yuniana et al. (2023) stated that $VO_2\text{max}$ can show how fit someone is by measuring how well their heart and lungs can make and use oxygen while working out.

Meanwhile, motor education ability refers to a person's ability to learn and master complex motor skills through physical education (Syahril et al., 2020). So far, research on motor education skills in primary school students has shown some intriguing findings (Aliriad et al., 2020). However, there is a lack of literature that focuses only on athletes or students who are engaged in extracurricular activities, and there are no studies related to late-stage primary school students, especially those who are rarely involved in learning activities. Although this research provides valuable initial insights, further research is needed to deepen the understanding of $VO_2\text{max}$ levels and educational skills in primary school students, especially in late primary school students rarely involved in physical education learning activities. By expanding this research, we can develop a more effective and holistic physical education approach that considers aspects of physical fitness and students' motor skills to improve the quality of their education and holistic development. This research aims to investigate $VO_2\text{max}$ levels and motor education abilities in primary school students taking final school exams. With a comprehensive understanding of physical fitness levels and motor skills during a busy exam period, we can identify existing problems and develop practical solutions. This research's main objective is to significantly contribute to the development of physical education in primary school students and to improve the quality of students' lives holistically. The results will provide a strong foundation for designing appropriate programs to improve students' physical fitness and motor skills and optimize physical education learning in primary schools.

Thus, the research is urgently needed to provide an overview of final-year primary school students' physical fitness and motor skills during a busy final exam. The results of this research will provide a strong foundation for education policymakers, teachers, and parents to design practical approaches to improve students' physical fitness and motor skills while considering existing academic obligations.

Methodology

This research used an ex post facto research design, allowing data collection from existing participants and observing occurring variables (Giuffre, 1997). This approach aligns with the research objectives. It comprised 24 students from Kartika I-12 Primary School in Padang City, selected using purposive sampling. The researchers conducted the $VO_2\text{max}$ measurement using the multistage fitness test, the BIP test instrument.

The BIP test results for 13-year-old final-year primary school students were categorized into six groups for male and female students, as shown in Table 1.

Table 1. *Classification of cardiorespiratory fitness*

| Category | Age (Year) |
|-----------|-------------|
| | 13-19 |
| Male | |
| Superior | > 55.9 |
| Excellent | 51.0 - 55.9 |
| Good | 45.2 - 50.9 |
| Fair | 38.4 - 45.1 |
| Poor | 35.0 - 38.3 |
| Very Poor | <35.0 |
| Female | |
| Superior | > 41.9 |
| Excellent | 39.0 - 41.9 |
| Good | 35.0 - 38.9 |
| Fair | 31.0 - 34.9 |
| Poor | 25.0 - 30.9 |
| Very Poor | < 25.0 |

This research used two main instruments to measure students' physical fitness and motor skills:

- Multistage Fitness Test (Bleep Test)

Students' aerobic capacity is measured using the multistage fitness test or Bleep Test, the standard method for estimating $VO_2\text{max}$ (cardiorespiratory capacity). This test is carried out on a 20-meter track, where students are asked to run back and forth according to the rhythm of a beeping sound that gets faster. Students' $VO_2\text{max}$ is then categorized based on age and gender standards as defined in the fitness classification table (Leger & Lambert, 1982).

- IOWA Brace Test

Students' motor educability is measured using the IOWA Brace Test, which consists of

10 test items for male and female students (Johnson & Nelson, 1969). Each student is given **two chances in each test. They receive 2 points for a first try, 1 point for a second, and no points for failing both times.** The total maximum score for each student is 20 points. Some of the items tested in the IOWA Brace Test include:

- Hop Backward
- One Knee Balance
- Half Turn Jump (Left Foot)
- Forward Hand Kick
- Full Turn (Left & Right)
- Side Learning Rest
- Grapevine Step
- Cross Leg Squat
- Knee Jump to Feet
- Russian Dance

The VO₂max measurement and motoric educability data were analyzed descriptively using SPSS version 25 software. We carried out a statistical analysis to see the data distribution, the relationship between variables, and differences based on gender and physical fitness categories. The data was presented in tables, graphs, and diagrams to facilitate the interpretation of the research results. With this more detailed approach, the research can provide more profound insights into the relationship between the fitness and motor skills of 6th graders and its implications for primary school education.

Results

The researchers looked at the VO₂max test and motor educability data by gender and showed the results as a percentage for each item to see how the male and female students compare. The researchers described the VO₂max levels of 24 final-year primary school students in the research as follows:

Table 2. *Cardiorespiratory fitness results of male and female students*

| VO₂max | Fa | Fr(%) | Category |
|--------------------------|-----------|--------------|-----------------|
| Male | | | |
| > 55.9 | 0 | 0 | Superior |
| 51.0 - 55.9 | 1 | 7 | Excellent |
| 45.2 - 50.9 | 3 | 21 | Good |
| 38.4 - 45.1 | 3 | 21 | Fair |

| | | | |
|---------------|---|----|-----------|
| 35.0 - 38.3 | 3 | 22 | Poor |
| <35.0 | 4 | 29 | Very Poor |
| Female | | | |
| > 41.9 | 0 | 0 | Superior |
| 39.0 - 41.9 | 0 | 0 | Excellent |
| 35.0 - 38.9 | 0 | 0 | Good |
| 31.0 - 34.9 | 0 | 0 | Fair |
| 25.0 - 30.9 | 5 | 50 | Poor |
| < 25.0 | 5 | 50 | Very Poor |

Male students

- Very Poor: Most male students (29%) have a VO₂max level below 35.0, which puts them in the “Very Poor” category. This result shows that almost a third of male students have a very low level of cardiorespiratory fitness.
- Poor: Almost a quarter of male students (22%) are in the “Poor” category, with a VO₂max value between 35.0 and 38.3. This data shows that most male students have a low level of cardiorespiratory fitness.
- Fair: Several male students (21%) have VO₂max levels between 38.4 and 45.1, which puts them in the “Fair” category. This rating indicates a moderate level of cardiorespiratory fitness.
- Good: Several male students (21%) have a VO₂max level between 45.2 and 50.9, which puts them in the “Good” category. This value indicates a good level of cardiorespiratory fitness.
- Excellent: Only a tiny percentage of male students (7%) reached the “excellent” category, with VO₂max values between 51.0 and 55.9.
- Superior: No male students reached the “Superior” category (VO₂max > 55.9).

Female students

- Poor: Half of the female students (50%) were in the "Poor" category, with VO₂max values between 25.0 and 30.9.
- Very Poor: The other half of female students (50%) are in the "Very Poor" category, with VO₂max values below 25.0.
- Other Categories: There are no female students in the "Superior," "Very Good," "Good," or "Fair" categories.

Overall, the data show that the cardiorespiratory fitness levels of male students are more varied, with the majority falling into the “Very Poor” to “Good” categories. Meanwhile, the cardiorespiratory fitness levels of female students tend to be lower, with all students falling into the “Poor” or “Very Poor” categories. This finding indicates a significant difference in

cardiorespiratory fitness levels between male and female students in this group. The histogram diagram mentioned could be included to complete this analysis. The diagram will provide a more precise visualisation of the distribution of VO_2max values for both groups of students. The histogram diagram presents the data from the table in the following manner:

Figure 1. *Diagram of VO_2max ability of male and female final grade primary school students*

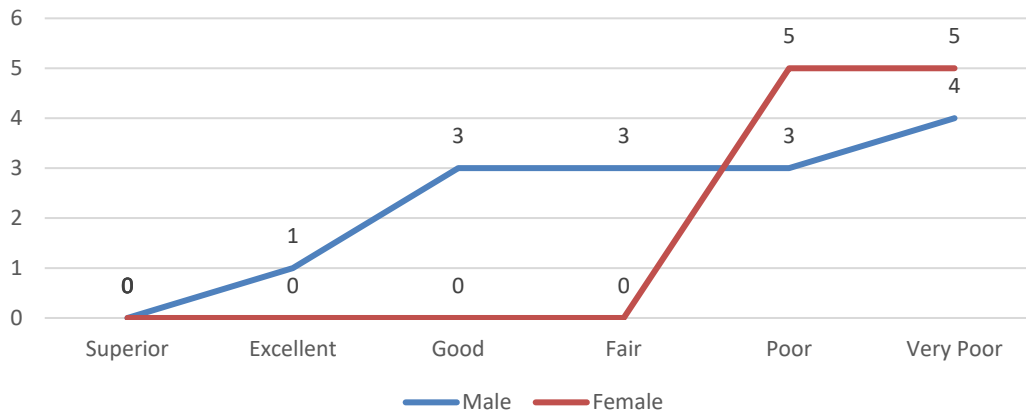


Figure 1 above presents the results of descriptive statistics for the motor education ability of primary school students in the final grades, which includes 10 different test items for boys and girls. The following is an analysis of the results shown in the table:

Male students

- **Motor Performance:** Male students show more significant motor ability variation than female students. The difference can be seen in several items' higher average scores and distribution of test results.
- **Excellence in Several Tests:** Male students show better results in several test items, indicating they have an advantage in certain physical activities.

Female students

- **Motor Performance:** Female students show more consistent results but tend to be lower than male students. This may reflect differences in interest or participation in physical activity.

- **Specific Skills:** Although the overall results are lower, some female students may demonstrate exceptional abilities in certain items, indicating potential that can be developed.

These data indicate significant differences in motor education abilities between male and female students. Male students have more varied and often higher performance, while female students show more homogeneity but tend to have lower results. Further research is needed to understand the factors that influence this difference and to design programs that can improve motor skills for both groups of students. Presenting the data as a diagram will also provide a clear visualization of the comparison of motor abilities between male and female students, which can be the basis for decision-making in physical education programs. The descriptive statistical results for the motor skills of 24 male and female students can be seen in Table 3.

Table 3. *Motor education descriptive statistics*

| Motor Educability | Standard Score | Motor Educability |
|----------------------------|-----------------------|--------------------------|
| | Mean | SD |
| Male | | |
| Hop Backward | 1.5 | 0.5 |
| One Knee Balance | 1.1 | 0.7 |
| Half Turn Jump Left Foot | 0.6 | 0.6 |
| Forward Hand Kick | 0.4 | 0.5 |
| Full Left Turn | 1.3 | 0.5 |
| Side Learning Rest | 1.4 | 0.5 |
| Gravepine | 1.1 | 0.7 |
| Cross Leg Squat | 1.1 | 0.4 |
| Knee Jump to Feet | 1.1 | 0.7 |
| Russian Dance | 0.1 | 0.3 |
| Female | | |
| Hop Backward | 0.5 | 0.5 |
| Full Right Turn | 0.7 | 0.0 |
| Full Left Turn | 0.6 | 0.0 |
| The Top | 0.5 | 0.3 |
| Forward Hand Kick | 0.5 | 0.7 |
| One Foot Touch Head | 0.5 | 0.6 |
| Gravepine | 0.7 | 0.3 |
| Knee Jump to Feet | 0.4 | 0.3 |
| Side Kick | 0.7 | 0.3 |
| One Knee Head to The Floor | 0.3 | 0.3 |

Table 3 presents descriptive statistics for the motor education abilities of primary school students in the final grades, focusing on two groups: male and female. The following is an analysis of the results shown in the table.

Male students

- **Average Score:** The average score for male students varies across test items. For example, the highest ability is in the Hop Backward test, with an average score of 1.5 and a standard deviation of 0.5, indicating that many students can perform this test well.
- **Variation in Ability:** Male students show higher and more varied scores on various items, such as Full Left Turn (1.3) and Side Learning Rest (1.4), indicating better motor skills in some activities.
- **Skills That Need Attention:** Conversely, the Russian Dance test shows a very low average score (0.1), indicating that male students may struggle with this skill.

Female students

- **Average Score:** The average score for female students is lower than for male students. For example, on the Hop Backward test, the average score is only 0.5, indicating that female students have more significant challenges in this skill.
- **Standout Skills:** Although the overall average is lower, female students perform well on items such as Full Right Turn (0.7) and Grapevine (0.7), which shows that there are some areas where they can compete with male students.
- **Skills Need Improvement:** Tests such as One Knee Head to The Floor have a low average score (0.3), reflecting the need for further development in these motor skills.

The analysis results in Table 3 show that female students have better motor skills than male students, with higher average scores in most test items. However, female students demonstrate pretty good abilities in several skills. Designing a physical education program that can help female students strengthen their motor skills and provide opportunities for male students to continue developing their abilities in various activities is essential. This data will be invaluable in formulating appropriate interventions to improve motor educability among students in the final years of primary school.

Table 4. *Data categories: Student motor educability*

| Value | Classification | Fa | Fr (%) |
|---------|----------------|----|--------|
| Male | | | |
| 60 - 66 | Very Good | 4 | 29 |
| 54-59 | Good | 1 | 7 |
| 48-53 | Fair | 1 | 7 |
| 42-47 | Poor | 6 | 43 |
| 36-41 | Very Poor | 2 | 14 |
| Female | | | |
| 76 – 83 | Very Good | 1 | 10 |
| 68 – 75 | Good | 0 | 0 |
| 60 – 67 | Fair | 0 | 0 |
| 52 – 59 | Poor | 1 | 10 |
| 44 - 51 | Very Poor | 8 | 80 |

The results of the motor educability data for primary school students and the average scores for boys and girls are categorized and can be seen in Table 4. The results for boys show that 4 (29%) are in the very good category, 1 (7%) is in the good category, 1 (7%) is in the fair category (7%), 6 (43%) are in the bad category and 2 (14%) children are in the very bad category. Meanwhile, among female students, only 1 (10%) child was in the very good category, 1 (10%) child was in the poor category, and 8 (80%) children were in the very bad category. Therefore, most of the motor educability data for primary school children in the category of final year students was in the very bad category, namely 10 (42%) students. The data from the table is then presented in the histogram diagram as follows.

Figure 2. *Ability diagram of motor educability of male and female students in the final grade of primary school*

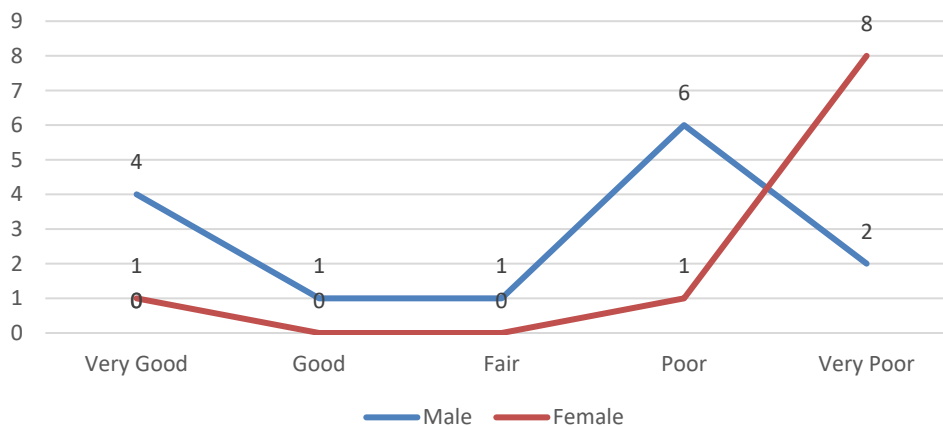


Figure 2 presents a diagram illustrating the motor educability of male and female students in the final grades of primary school. The following is an analysis of the diagram:

Male students

- **Total Performance:** The diagram shows that male students generally have better motor skills than female students, with higher scores on most test items.
- **Skill Highlights:** Items such as Hop Backward and Full Left Turn show high scores, reflecting the superiority of male students in physical activities that require agility and balance.

Female students

- **Consistent Performance:** Although female students show lower results overall, the diagram indicates that they have some fairly good skills, such as in the Grapevine and Full Right Turn items.
- **Challenges:** Some test items, such as One Knee Head to The Floor, show lower scores, indicating the need for more attention in developing motor skills.
- This diagram provides a clear visualization of the comparison of motor educability abilities between male and female students. These results show the importance of a focused physical education program to improve motor skills, especially for female students, and facilitate further development for male students. This visualization can help educators design appropriate interventions to improve the quality of physical education in schools.

Discussion

Their school-age determines the quality of individuals in adulthood because this is the stage of their physical and motor growth and development (Ganapathy & Monisha, 2020). At primary school-age, children often perform loose movements such as running, jumping, throwing, and catching; these activities are helpful for training movement skills and increasing their growth and immunity (Ilham & Sepdanius, 2020; Komaini et al., 2022). Final-year primary school students' physical fitness and motor skills significantly affect their cardiorespiratory and motor abilities. In this research, it was shown that the majority of final-year primary school students have a low level of physical fitness. The level of physical fitness can be measured from the volume of oxygen when performing physical activity at maximum volume and capacity. Regarding VO₂max, nine children were found to be in the very poor category, eight children in the poor category, three in the moderate category, three in the good category, and only one in the very good category. VO₂max is an increase in the body's ability

expressed in ml/minute/kg. Someone with a high VO_2 max has excellent endurance and physical fitness (Bahtra et al., 2020; Fitriani et al., 2023).

Furthermore, this research reveals that most students have very poor motor skills. Regarding motor education skills, out of 24 children tested with 20 different items between men and women (Iqbal et al., 2019), or 42%, were in the very poor category. This indicates that students have difficulty in mastering motor skills. Motor skills are a person's ability to do something new. Motor skills are a person's capacity for various movements and new skills (Shakty et al., 2022). Motor educability can affect learning ability because it relates to thinking and performing new skills or movements. This finding implies the need to evaluate the implementation of physical education in primary schools and increase student participation in physical activities outside the school environment. A comprehensive and systematic approach is needed to ensure students receive practical and adequate physical education.

Cooperation between schools, teachers, and parents is essential in improving students' physical fitness and motor skills. Collaborative efforts are needed to create a supportive environment and involve parents in supporting and facilitating physical activity outside school, which can also significantly benefit students' physical and motor development. Good physical fitness and motor skills impact students' health and are related to their academic performance and social development. Therefore, physical education should be integral to basic education, providing opportunities for all students to grow and develop optimally. This research supports previous findings that children's physical fitness and motor skills can decline due to a lack of participation in adequate physical activity during school hours (Strong et al., 2005; Robinson et al., 2015). In addition, several studies indicate that children with a higher level of physical fitness tend to have better academic achievement due to increased blood flow to the brain, which can improve cognitive function and concentration (Donnelly et al., 2016). Therefore, educational policies that balance academic learning and physical activity are essential to support the holistic development of children.

Physical education teachers are important in creating a learning environment that supports students' physical and motor development. Some strategies that can be applied include:

- Develop a learning program that integrates physical activity into the school schedule, even during exam periods.
- Using fun and game-based learning methods increases students' motivation to exercise.
- Conduct periodic assessments of students' physical fitness and motor skills to monitor their progress.
- Parents are responsible for ensuring their children get enough physical activity outside school. Some recommendations that can be applied include:
 - Encourage children to be physically active through recreational activities such as cycling, swimming, or outdoor play.
 - Reduce screen time and replace it with beneficial physical activities.
 - Participate in physical activities with children to promote healthy lifestyle habits.

- The results of this research emphasize the importance of education policies that support physical activity in schools. Some policy recommendations that can be implemented include:
- Make physical education a compulsory part of the school curriculum for a sufficient duration.
- Developing a fitness program that can be implemented in schools to increase student participation in physical activity.
- Providing adequate sports facilities and equipment in schools to encourage more physical activity.

Conclusion

The results indicate that the level of physical fitness and motor skills of sixth graders facing exams on a tight schedule is low. Of the 24 students tested, the majority had very poor VO₂max levels, indicating their low cardiovascular endurance. In addition, many students have difficulty developing basic motor skills, with 42% falling into the very poor category. These findings emphasize the importance of paying attention to physical fitness during the exam period. The lack of physical activity integrated into the physical education curriculum is one of the factors that contributes to the low physical fitness and motor skills of students. A greater focus on academic achievement often comes at the expense of time for physical activity. This research emphasizes the need for a balance between academic and physical education to support the holistic development of children.

As a recommendation, physical education teachers, parents, and education stakeholders need to increase student involvement in physical activity, even during exam periods. Program development that integrates physical activity into the school schedule can help students maintain their physical fitness. In addition, collaboration between schools and parents is also needed to create an environment that supports physical activity outside school. This research provides important insights into sixth graders' physical fitness and motor skills. These results can form the basis for developing better education policies, including making physical education compulsory and providing adequate facilities and resources to support students' physical activity.

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