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The relationship between student interest and discipline in compulsory school morning exercise programs: a cross-sectional correlational study in an Indonesian vocational school

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ABSTRACT

Regular participation in physical activity is essential for adolescents' physical and psychological well-being. However, students often demonstrate varying levels of participation in school-based physical education programs due to differences in motivation and personal interest. This study examined the relationship between student interest and discipline in participating in the Senam PAHAMI morning exercise program at SMKN 4 Padang, Indonesia. Drawing on Self-Determination Theory and Expectancy-Value Theory, the study hypothesized that higher levels of student interest would be associated with greater discipline. A quantitative correlational research design was employed involving 427 Grade X and XI students, representing the entire eligible population through a census approach. Data were collected using Likert-scale questionnaires measuring student interest and discipline. The instruments demonstrated good internal consistency, with Cronbach's alpha coefficients of 0.82 and 0.85, respectively. Data were analyzed using the Kolmogorov-Smirnov normality test, Pearson product-moment correlation, and the coefficient of determination. The findings indicated moderately high levels of both interest ($M = 57.70$, $SD = 4.62$) and discipline ($M = 69.33$, $SD = 5.49$). A statistically significant positive correlation was found between student interest and discipline ($r = 0.413$, $p < 0.001$). The coefficient of determination showed that student interest explained 17.02% of the variance in discipline, while the remaining variance may be attributed to factors such as teacher supervision, school culture, peer influence, and individual characteristics. These findings support Self-Determination Theory and Expectancy-Value Theory, emphasizing that fostering students' intrinsic interest can enhance discipline in school physical activity programs. The results provide practical implications for physical education teachers and school administrators in promoting student engagement and participation.



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Introduction

Adequate physical exercise during the teenage years helps in physical health as well as psychological and social development. International public health agencies continue to highlight it: World Health Organization (WHO) points out that children's and adolescents' activities are connected to their ability to improve physically, cardiometabolically and musculoskeletal development, and brain function and mental health besides having

lower body fat (World Health Organization, 2024). However, the world only aims at a 10 percent reduction in the number of physically inactive adolescents worldwide by 2025 and a 15 percent by 2030 (Guthold et al., 2020), suggesting that lack of physical activity is still a big issue not a resolved one. A cross-comparison of physical activity guidelines from Australia, Canada, China, UK, USA, and WHO reveals the persistent worldwide endeavors by different countries to formulate similar activity prescriptions for children and adolescents (Hu et al., 2024).

Schools are pivotal in this gap. A holistic school physical activity plan brings together a range of methods to get students moving both at recess, in lessons, and out of school hours, and schools are ideal settings for supporting healthy lifestyle choices via PE and planned physical activity (Bull et al., 2020). More recent evidence reinforces this role: reviews of self-determination-based physical education interventions published between 2019 and 2024 report consistently larger gains in student engagement and adaptive behaviour for autonomy-supportive programmes than for standard practice (Vasconcellos et al., 2020), and structural equation modelling in secondary schools shows that a task-oriented motivational climate predicts more disciplined behaviour than any single psychological variable considered in isolation (Claver et al., 2020). Systematic reviews of school-based physical activity programmes confirm that well-implemented interventions can raise students' activity levels, although effect sizes vary considerably with programme design and delivery fidelity (Dobbins et al., 2013). That earlier review, however, neither isolated compulsory, pre-instructional morning formats nor examined psychological outcomes such as discipline, which is the specific gap the present study addresses. Morning exercise programs short, structured group activity sessions that are held before class are one of the most frequently used ways Southeast Asian school systems, such as in Indonesia, employ movement in school days without interfering with academics.

There is cross-national evidence that the physical activity at school varies considerably based on how one designs and executes delivery of physical activity. Motivated by the example of Finland, a country which, in turn, used national funds to support the provision of physical activity counseling through one hundred and twenty-three cities of which seventy-four were able to make their counseling programs part of the school project plans (Kolunsarka, 2024), one can observe that it is an intervention of a type driven by the government and involving substantial resources that have been used. From the examples mentioned, one can see that the main or the school-based exercise activity program can work well regardless of the type of system. However, its success largely depends on student engagement on a psychological level rather than mere implementation as part of policy. Indeed, survey evidence from Indonesian secondary schools shows that students' interest in physical education itself fluctuates with both internal factors such as motivation and external factors such as teaching methods, peer dynamics, and facilities (Kurniawan et al., 2021), underscoring the need to examine interest specifically rather than assume it is stable across programmes.

Therefore the study focuses on a key issue raised here: mere attendance won't bring gains if students are present but disengaged. One form of attendance which is sustained entirely by the desire to please the staff is substantially different from the form of attendance which is motivated by the child's genuine interest and the distinction has a direct correlation with how regularly students complete required movements, follow instructions and preserve organization during the sessions that is, how disciplined their behavior with the program is.

The modern motivational theories provide us with a means of grasping this difference. Self-determination theory (SDT) is one such theory that conceptualizes motivation as a continuum beginning with amotivation, passing through different modes of external regulation to finally arriving at intrinsic motivation. An intrinsically motivated person is someone whose genuine interest, joy, and enjoyment are evident (Wang et al., 2024). Learning engagement in the context of the physical education environment is primarily driven by intrinsic motivation, and encouraging motivation, in turn, has led to greater energy, emotional engagement, and better concentration in physical education settings. Motivational strategies based on SDT have had quite real applications in physical education. In fact, the physical education teachers participated in co-creating some school-level programs that implemented SDT motivational strategies in order to motivate the students physically and also to promote the out-of-school physical activity levels (Standage et al., 2025). A large-scale meta-analysis further shows that autonomous, self-determined motivation in physical education is consistently linked with more adaptive engagement, whereas controlled forms of regulation and amotivation are linked with maladaptive outcomes (Vasconcellos et al., 2020), a pattern echoed in studies showing that satisfying students' needs for autonomy, competence, relatedness, and novelty strengthens their motivation and intention to remain physically active (Fernández-Espínola et al., 2020; Gómez-López et al., 2025).

Expectancy-value theory (EVT) can be looked upon as a different lens that gives one another point of view. The theory suggests that an individual's choices concerning achievements stem from the expectation that an individual can succeed and, in addition, subjective assessment of the value of a task in a given area; the former

is a result of one's belief that it will bring about success while the latter is one's value attached to the task, that is, why one might do it. Also, the students who are high on expectations, those with high values, and the ones who think that the cost of being emotionally attached is minimal will generally be more motivated, which then influences their effort, engagement, and perseverance (Eccles & Wigfield, 2023). In physical education context, such a form of achievement motivation as expectancy-value can support learning behaviors and development of situational interest, which can lead to fitness improvement and continued participation (Shang et al., 2023). "Cost" is an especially key concept with regards to exercise in the morning: since such sessions are before the regular lessons, students who think that the amount of effort or the time cost involved in taking part in such a session is high compared to its benefit will hardly demonstrate greater engagement even if the programme objectively is very good. Empirical work applying the expectancy-value model to at-risk and cross-national adolescent samples confirms that perceived cost, alongside expectancy beliefs and task value, meaningfully predicts physical activity participation and related outcomes (Liu & Xiang, 2023; Gallardo et al., 2020).

Although we can stand on the ground of this theory, many areas are still in need of more in-depth research. Firstly, previous studies on physical activities in schools have focused almost wholly on changes in health or fitness. They seldom touched on psychological factors that may determine students' compliance behavior with such interventions. Secondly, the SDT or EVT applied to physical education mainly looked at students' general PE classes involvement or out-of-school activities. Therefore, they didn't address physical education in its specific, timed, and mandatory form in a pre-instructional morning exercise session. Thirdly, bulk of the research has been done in middle-school or general secondary school context; little empirical work is to be made in vocational secondary schools (SMK) context. Fourthly, studies have very seldom identified and measured the specific relationship between interest and discipline separately from the more general concepts like engagement or loyalty. Lastly, researchers don't know whether, apart from the current study, there have been any studies examining this relationship at SMKN 4 Padang or similar Indonesian vocational schools where a morning exercise is being done as a part of the Merdeka P5 curriculum project implementation (Irsyad & Fitri, 2023).

The innovation of our research is the measurement of the relationship between interest and discipline in the case of compulsory, pre-instructional, school-based exercise at a micro-level by the use of a large sample ($N = 427$) representing the whole eligible population of vocational students rather than a smaller convenience sample. As such, the goal of the study is to explore how student's interest and discipline are related in implementing the morning exercise program for students of grade X and XI at SMKN 4 Padang.

Method

Research Design

This work was a quantitative correlation study aiming at identifying the relationship between the interest and the discipline of the students who took part in the morning exercise programs. No experimental treatment was administered to the participants throughout this study.

Participants and Setting

The study took place at SMKN 4 Padang, a vocational secondary school located at a public location in the Lubuk Begalung area, town of Padang, in West Sumatra, Indonesia, and was performed the four-day period, that is July 20-23, 2026.

Population and Sampling

The total number of students across grades X to XII was 657. Using a purposive sampling method, students who were in grade XII were not included since they were busy participating in off-site industrial field practices (Praktik Kerja Lapangan) which overlapped with our data collection period and thus were not able to participate in the school's morning exercise program. The resulting sample was the entire population of 427 students from grades X and XI (grade X had 212 and grade XI, 215 students), which is to be noted is almost two-fifths of the entire school population. This student body consisted of 188 boys and 239 girls. This exclusion is acknowledged as a potential source of selection bias, since grade XII students may be subject to different disciplinary norms during their internship period; however, because the resulting sample constitutes the entire eligible population of grades X and XI rather than a probability draw from it, a separate a priori power analysis was not required, as statistical power for the correlational analysis is maximized when the full eligible population is enumerated.

Instrument

A structured questionnaire was used to collect data and it was based on a five-point Likert scale (Strongly Agree = 5 to Strongly Disagree = 1). The tool examined two constructs: "Student Interest", which was measured by four factors (pleasure, attraction, attention, involvement/participation); and "Discipline", which was captured by five factors (compliance with rules, punctuality, responsibility, consistency of participation, and obedience to instructions).

Validity and Reliability

The validity of the items was judged by calculating the Pearson product-moment correlations item-by-item against total scores. Only those items for which $r(\text{calculated})$ was statistically greater ($r(\text{table})$) at the 5% level of significance were kept. The reliability of the measurement tool was determined through Cronbach's alpha, which was 0.82 for the Student Interest scale and 0.85 for the Discipline scale (both classified as highly strong), as per a standard interpretation of such measures (0.80-1.00 = highly strong; 0.60-0.79 = very strong; 0.40-0.59 = moderately strong; 0.20-0.39 = weak; 0.00-0.19 = very weak). Cronbach's alpha remains the most widely reported internal-consistency index in educational research (Dorsah, 2024), although it is increasingly recognised that ordinal, Likert-type items can bias alpha estimates, and that reporting alternative or ordinal reliability coefficients alongside alpha strengthens the credibility of an instrument's reliability claims (Zakariya, 2022; Park, 2024). Because this adapted instrument has not previously undergone confirmatory factor analysis in an Indonesian vocational-school population, the four-factor interest and five-factor discipline structures reported here are treated as provisional pending independent factor-analytic validation; this is noted explicitly as a limitation below.

Data Collection and Ethical Considerations

Questionnaires were administered face to face at different classes for data collection. Approval from the university (Universitas Negeri Padang), West Sumatra Provincial Education Office, and the school administration were granted prior to data collection.

Statistical Analysis

The data analysis was carried out via IBM SPSS Statistics, by the following ways: (1) checking the distribution of the data for a normality by the Kolmogorov-Smirnov test, (2) assessing linearity, (3) calculating a Pearson product-moment correlation, (4) interpreting coefficient of determination or in other words, what percent of outcome variance is predictable from predictor variable (r -squared times 100%). Because both variables were found not to be normally distributed (see Results), Spearman's rank-order correlation (ρ) was additionally calculated as a non-parametric robustness check alongside the Pearson coefficient.

Results

Participant Characteristics

Table 1. Participant Characteristics (N = 427)

Characteristic	Category	n	%
Grade	X	212	49.6
Grade	XI	215	50.4
Gender	Male	188	44.0
Gender	Female	239	56.0

Table 1 shows that the sample was nearly evenly split between grade X (49.6%) and grade XI (50.4%), while girls (56.0%) outnumbered boys (44.0%) among the 427 participants. This balanced grade distribution and the larger share of female respondents mirror the school's overall enrolment composition and support the representativeness of the sample for the correlational analysis reported below.

Descriptive Statistics

Table 2. Descriptive Statistics for Student Interest and Discipline

Variable	N	Min	Max	M	SD
Student Interest	427	44	69	57.70	4.62
Discipline	427	56	83	69.33	5.49

Average discipline scores came out quite a bit higher (69.33) than interest scores (57.70) when comparing them on a descriptive level. Because interest and discipline are measured on different item sets and scale ranges, this difference in raw means does not indicate that discipline exceeds what interest would predict; the two descriptive means are not directly comparable, and their association is more appropriately assessed through the correlational analyses reported below.

Normality Test

Table 3. Kolmogorov-Smirnov Normality Test

Variable	N	K-S Z	Sig.	Result
Student Interest	427	1.965	0.001	Not normally distributed
Discipline	427	1.732	0.009	Not normally distributed

Both variables greatly diverged from the normal distribution ($p < 0.05$ in each case). As a result of such discovery limitation of parametric methods has been raised.

Pearson Correlation

Table 4. Pearson Product-Moment Correlation Between Student Interest and Discipline

Variables	r	Sig. (2-tailed)	N	Interpretation
Interest x Discipline	0.413	< 0.001	427	Moderate, positive

Table 4 confirms that the association between student interest and discipline was positive, statistically significant, and moderate in magnitude across the full sample of 427 students, indicating that higher interest scores were systematically, though not perfectly, accompanied by higher discipline scores. Given the non-normal distribution of both variables reported in Table 3, a Spearman's rank-order correlation was also computed as a robustness check ($\rho = 0.398$, $p < 0.001$), which closely matched the Pearson coefficient ($r = 0.413$) in both direction and magnitude, supporting the substantive conclusion despite the normality violation.

Table 5. Interpretation Criteria for Correlation Coefficients

Interval	Category
0.00-0.199	Very weak
0.20-0.399	Weak
0.40-0.599	Moderate
0.60-0.799	Strong
0.80-1.000	Very strong

As shown in Table 5, the obtained coefficient ($r = 0.413$) falls within the 0.40-0.599 interval, classifying the interest-discipline relationship as moderate rather than weak or strong. This places the present finding roughly in the middle of the interpretive scale used to benchmark the strength of correlational associations in this field.

Coefficient of Determination and Hypothesis Testing

The r-squared value converted to percentage form was 17.02%, which means that student interest accounted for 17.02% of the variability in discipline scores while 82.98% of it was attributed to other reasons beyond the scope of this research. With the p-value being less than 0.001 ($p < 0.05$) the null hypothesis (H_0) was considered as no relationship while the alternative hypothesis (H_1) was supported: a statistically significant positive association was observed in student interest influencing discipline with the morning exercise programs at SMKN 4 Padang.

Discussions

Summary of Key Finding

The statistical significance of the positive correlation revealed a moderate relationship between student interest and discipline of morning exercise participation ($r=0.413$, $p<0.001$). Interest accounted for 17.02% of the changes in discipline scores. The result was also consistent with the study's alternative hypothesis. It can therefore reasonably be concluded that interest indeed contributes to discipline, albeit it is far from being the main factor.

Interpretation in Light of Motivational Theory

This positive direction of the relationship fits very well the theory of self-determination that explains the nature of autonomous engagement: students engaging in activities that are intrinsically delightful for them will be able to continue their participation without external coercion because when one is intrinsically motivated, one's interest, delight, and fulfillment are purely directed towards the activity itself and not one's compliance dictated purely by the reward or penalty (Wang et al., 2024). Besides that, the expectancy-value framework gives a complementary explanation for the correlation being significant only a little rather than very strong: students usually do not invest their time and effort in a task when the perceived cost (like, effort, opportunity, or emotion) is too large compared to what the reward (anticipated benefit) will be (Shang et al., 2023), a pre-instructional compulsory running session has a time and effort cost that is fixed and quite independent of whether a student finds it interesting. Rather than competing accounts, SDT and EVT are treated here as complementary: SDT explains why intrinsically motivated participation can persist without external control, while EVT's cost

construct explains why that motivation translates into only a moderate, rather than a strong, correlation with discipline once the fixed structural cost of a compulsory, pre-instructional format is taken into account (Liu & Xiang, 2023; Gallardo et al., 2020). This still leaves the majority of disciplinary variance (82.98%) unaccounted for; consistent with the evidence on teacher supervision and school-level enforcement discussed above (Adilla & Lestari, 2024; Fisher et al., 2023; Way, 2011), structural and institutional factors external to individual motivation are the most plausible candidates for this large residual, rather than any single additional psychological variable.

Comparison with Prior Research

This outcome fits neatly into the school disciplinary research trend that although motivating, inner factors are usually of great importance, they are rarely acting independently. A series of recent investigations into student disciplinary behavior has shown that the severity of a school's policies and the level of their enforcement play a major role in disciplining students, often to a greater extent than any single psychological variable (Way, 2011). From studies of school policy compliance, it has been revealed that with good communication of what's allowed or not and a follow-up on these rules, kids often show more mature and collaborative behaviors, which further confirms that school discipline results from student behavior and school policies working together, not one being the cause while the other having no effect. Structural equation modelling among secondary school students likewise shows that a task-oriented motivational climate and psychological needs satisfaction predict disciplined behaviour alongside academic performance, underlining that motivational and structural factors operate jointly rather than as substitutes (Claver et al., 2020). Consistent with this, evidence on teacher supervision indicates that closer monitoring is associated with improved student discipline (Adilla & Lestari, 2024), while systematic reviews of school-based enforcement strategies caution that heavier-handed disciplinary approaches do not automatically translate into safer or better-behaved schools and can carry unintended costs (Fisher et al., 2023). The present moderate correlation is also broadly consistent with the wider Indonesian and cross-national literature on interest and engagement in physical education: survey evidence shows that Indonesian secondary students' interest fluctuates with both internal motivation and external factors such as teaching methods and peer dynamics (Kurniawan et al., 2021); autonomy-supportive teaching and feedback have been shown to mediate the link between perceived support and school attachment (Sagin et al., 2025); and satisfaction of autonomy, competence, relatedness, and novelty needs has repeatedly predicted stronger motivation and continued participation among secondary students (Gómez-López et al., 2025; Fernández-Espínola et al., 2020; Standage et al., 2025). Taken together, this body of work reinforces the conclusion that interest is a consistent but partial predictor of engagement-related outcomes, discipline included, across varied school settings.

The same kind of pattern has been observed in two other studies in a relatively similar organisational setting of school physical education and games. Setiawan (2022) found that most students in a vocational school in Nganjuk expressed great or high interest in physical education lessons. Another study by Wati, Gustiawati and Gani (2021) of 102 students reported an association ($r=0.612$) that is a bit stronger in numbers between implementing a structured learning-contract activity and improving students' discipline in physical education which accounts for 37.45%. The correlation in the current research is somewhat less strong (0.413 compared to 0.612) which could mean that having only an interesting context might not be enough for discipline. On the one hand, interest is important, while on the other, structured activities may contribute to greater self-discipline. This view seems also to be in agreement with the idea of the previous explanation that discipline is something that one has in one's make-up to a certain extent but it also can be achieved through external structures.

Practical and Theoretical Implications

In other words, the findings indicate that PE teachers and school administrators might be mistaken if they believe that disciplining and fostering students' interest in PE or sports is a zero-sum game. Rather than choosing between rule enforcement and creating student interest as opposing strategies, they should consider them cooperating strategies. Since student interest accounts for only a very small part of the variance in the discipline dimension, the initiatives aimed at encouraging and inspiring students to take part in morning exercise (through different forms of exercise at a given time, providing students with enjoyable music, using positive reinforcement methods) are definitely worth doing, but they should accompany and should not replace the other disciplinary side, that consists of consistent, clearly stated expectations that can be understood by students.

Theoretically, the finding contributes a domain-specific data point to the SDT/EVT literature: it demonstrates that in a compulsory, time-fixed, pre-instructional exercise format, the interest-discipline relationship holds but is attenuated relative to contexts with lower structural cost.

Limitations

First of all, the Kolmogorov-Smirnov test told us that both of the variables significantly deviated from normality. As a result, the authors caution that the parametric Pearson correlation should be interpreted cautiously; a nonparametric Spearman's rho was therefore computed alongside it as a robustness check and converged closely

with the Pearson result, which mitigates but does not eliminate this concern. Second, the design of a simple questionnaire is of very little help in uncovering whether one's interest leads to discipline or the other way around; because both variables were collected from the same self-report instrument at a single time point, common method bias cannot be ruled out, and the four- and five-factor structures of the scales still await independent confirmatory factor analysis. Third, although it was an appropriate research method, excluding grade XII students limits the generalizability to all secondary-school students population. Fourth, several important variables like teacher enforcer style, peer influence, and family support, that are identified in the broader discipline literature as having influential power, are not accounted for. Hence, the majority (82.98%) of the discipline variance remains unexplained.

Future Research

Potential research in the future may involve a combination of longitudinal, experimental, or other appropriate designs to verify causality, along with teachers' disciplinary actions and school's climate in the mix as interest factor, while comparing results with analyses on other kinds of vocational schools will give clearer picture.

Conclusions

This study looked at how student interest and discipline are connected through the school's morning exercise program implemented among 427 grade X & XI students at SMKN 4 Padang. Students on the whole showed both high student interest and discipline (interest $M=57.70$; discipline $M=69.33$) while Pearson correlation showed a significant moderate positive relationship between both variables ($r = 0.413$, $p < 0.001$). Besides, interest was associated with 17.02% of the variation in discipline. These findings indicate students' motivations from both self-determination and an expectancy-value theory, while at the same time, interest seems to work together rather than replacing structural and institutional aspects like school culture and the rules implemented. Because the design was cross-sectional and correlational, these findings describe an association rather than a causal effect, and longitudinal or experimental studies are needed to establish whether interest precedes discipline or vice versa. In practical terms, schools and PE teachers who want to foster student discipline during morning exercise programs may benefit from jointly cultivating an authentic level of student interest and keeping institutional expectations consistent and clearly stated. The author declares no conflicts of interest. This research received no external funding and was conducted without financial support from any public, commercial, or not-for-profit funding agency. The data supporting the findings of this study are available from the corresponding author upon reasonable request.

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