

Factors Affecting Senior High Students Engagement in Physical Activities: Towards Designing a More Engaging Physical Education Program

John Paul Daracan

University of La Salette, Inc., Santiago City, Isabela, Philippines

johnpauldaracan3@gmail.com ; johnpaul.daracan@deped.gov.ph

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ABSTRACT

This study examined the factors affecting Senior High School students' engagement in physical activities and used the findings as the basis for designing a more engaging Physical Education program at San Mateo Vocational and Industrial High School in San Mateo, Isabela. A descriptive-correlational census design was employed among 430 Grade 11 and Grade 12 students. Data were gathered through selected interviews and an adopted, expert-validated, and pilot-tested questionnaire covering interest, personal motivation, enjoyment, agentic, cognitive, behavioral, and emotional engagement, equipment and resources, institutional support and facilities, psychosocial factors, physical health, and instructional quality. Frequency, percentage, weighted mean, mean, standard deviation, Mann-Whitney U, Kruskal-Wallis H, and post hoc comparisons were used. The respondents

reported that the examined factors affected engagement to a great extent ($M = 3.21$). Instructional quality obtained the highest rating ($M = 3.36$), followed by motivation and enjoyment ($M = 3.25$ each), whereas physical health had the lowest mean ($M = 3.09$). No significant differences were found according to sex ($p > .05$). Differences across academic strands were significant for enjoyment and most engagement, resource, psychosocial, health, and instructional dimensions ($p < .05$), with HUMSS students generally obtaining the highest means; interest and motivation did not differ significantly by strand. Students participating in co-curricular sports scored significantly higher than nonparticipants across all dimensions ($p < .001$). These findings supported the development of Project S.C.A.F.O.L.D., a flexible, interest-based, strand-responsive framework emphasizing student choice, functional movement, resource optimization, healthy lifestyles, and diversity. The study concludes that supportive instruction is a major facilitator of engagement, but participation gaps related to health, resources, academic context, and prior sports involvement require a more inclusive and differentiated Physical Education program.

Keywords: *physical activity engagement, senior high school students, instructional quality, co-curricular sports, inclusive physical education, Project S.C.A.F.O.L.D.*

INTRODUCTION

Physical activity is central to adolescent health, psychological well-being, and readiness to learn, yet participation is not distributed evenly across school populations. Engagement in Physical Education is more than attendance: it includes students' willingness to act, emotional connection to activities, cognitive investment, and capacity to influence the learning process. Contemporary engagement research therefore treats participation as a multidimensional construct rather than a single observable behavior (Reeve et al., 2025; Stringfellow et al., 2024).

Within Senior High School, engagement is influenced by the interaction of personal motivation, enjoyment, perceived competence, social support, teaching practices, available facilities, and physical condition. Self-determination research explains that learners engage more meaningfully when activities support autonomy,

competence, and relatedness (Deci & Ryan, 2012). Similarly, the Theory of Planned Behavior proposes that attitudes, perceived social expectations, and perceived control shape students' intentions and participation (Ajzen, 1991). These perspectives suggest that even motivated students may disengage when resources are limited, activities appear irrelevant, or physical and psychosocial barriers reduce their perceived capacity to participate.

The issue is particularly important in rural and vocational-school contexts, where students may balance demanding strand requirements, household responsibilities, and limited access to equipment or organized sports. Evidence indicates that physical activity is influenced by factors operating at individual, interpersonal, school, and community levels (Hu et al., 2021). School programs that rely heavily on conventional competitive sports may therefore favor students with previous athletic experience while offering fewer meaningful entry points for non-athletes, students with health limitations, and learners whose academic workloads differ.

San Mateo Vocational and Industrial High School serves students from the ABM, HUMSS, and TVL strands, each of which may have distinct schedules, interests, and physical demands. Although Physical Education seeks to promote lifelong activity, the local pattern of engagement had not been comprehensively examined across interest, motivation, enjoyment, multidimensional engagement, resources, institutional support, psychosocial influences, physical health, and instructional quality. The absence of such contextual evidence limited the school's ability to design a differentiated and inclusive program.

Accordingly, this study examined the profile of Senior High School students, assessed the factors affecting their engagement in physical activities, determined whether engagement differed according to sex, academic strand, and co-curricular sports participation, and developed a responsive Physical Education program. The study's practical contribution is Project S.C.A.F.O.L.D., which translates the findings into flexible and interest-based modules intended to widen participation and support sustained healthy behavior.

Literature Review

Interest, Motivation, and Enjoyment

Interest and motivation influence whether students approach physical activity as an imposed requirement or as a personally valuable experience. Lobo and Dimalanta (2024) found that individual interest was positively associated with school engagement in Physical Education, indicating that relevance and personal preference help sustain involvement. Research on adolescent motivation likewise shows that participation is strengthened when activities connect with students' goals, competence, and social experiences (Antunes et al., 2024).

Self-Determination Theory explains this pattern through autonomy, competence, and relatedness. When students can make meaningful choices, experience progress, and feel supported, their motivation is more likely to become autonomous and durable (Deci & Ryan, 2012; Leo et al., 2022). Enjoyment is also important because it transforms activity from a performance demand into a positive learning experience. Berki and Tarjányi (2022) reported that enjoyment was associated with learning motivation and school performance, while Cachón-Zagalaz et al. (2023) emphasized the importance of creating a motivational climate that supports long-term participation and healthy habits.

Multidimensional Engagement and Psychosocial Influences

Student engagement includes agentic, cognitive, behavioral, and emotional participation. Agentic engagement is reflected when learners express preferences and contribute to the direction of activities; cognitive engagement involves attention, strategy, and effort; behavioral engagement includes participation and persistence; and emotional engagement concerns enjoyment, belonging, and affective response. A meta-analysis by Reeve et al. (2025) showed that the dimensions have related but specialized functions, while Stringfellow et al. (2024) demonstrated the value of measuring engagement comprehensively in Physical Education.

Engagement is also shaped by teacher and peer relationships. Supportive teaching can meet students' psychological needs and strengthen self-efficacy, whereas controlling or emotionally depleted teaching may reduce participation. Coterón et al. (2024) showed that structuring and controlling teaching styles affected motivation and engagement, and Franco et al. (2025) found that teacher burnout was negatively associated with

students' behavioral engagement. Reviews further indicate that teacher support operates together with personal characteristics and the wider learning environment (Prananto et al., 2025).

Social support can also connect physical activity with broader academic outcomes. Xiang et al. (2025) reported that social support and learning engagement mediated the relationship between physical activity and academic achievement. These findings support a program approach that does not treat engagement as an individual trait alone but creates opportunities for peer support, student voice, and psychologically safe participation.

Resources, Facilities, and Physical Health

The ability to participate depends partly on students perceived behavioral control, including access to equipment, safe spaces, time, and appropriate activities. Hu et al. (2021) identified facility access and environmental support as important influences on adolescent physical activity. Ma et al. (2024) similarly emphasized coordinated school and community efforts, appropriate curricula, and investment in quality equipment and facilities.

Resource limitations may reduce activity variety, lengthen waiting time, and prevent students from developing skills through repeated practice. For students with disabilities or physical limitations, the quality, accessibility, and adaptability of space and equipment are especially important. Deng et al. (2025) identified the physical environment, social environment, opportunities for activity, and modifiable activity features as central school-based influences on participation.

Physical discomfort, fatigue, injury, and health concerns may also discourage participation when programs are rigid or excessively competitive. Programs should therefore provide graded intensity, alternative activities, recovery opportunities, and choices that respect students' current capacity. Qin et al. (2025) showed that exercise self-efficacy helped explain the relationship between perceived quality Physical Education and subsequent activity, suggesting that appropriate progression can help students participate more confidently.

Instructional Quality and Inclusive Program Design

Instructional quality influences whether students understand tasks, feel supported, and perceive Physical Education as fair and achievable. Need-supportive teaching has been associated with stronger motivation, engagement, and intention to remain active (Leo et al., 2022). Xu et al. (2025) similarly found that teacher support strengthened engagement through psychological-need satisfaction and academic self-efficacy. Clear instruction, demonstration, encouragement, feedback, and student choice are therefore central program features.

Inclusive program design requires moving beyond a uniform sports model toward varied activities that accommodate interests, academic contexts, gender, experience, and physical capability. Silva et al. (2024) found that a fitness-education model enhanced engagement, autonomy, teamwork, and health knowledge, particularly when students participated in planning their own fitness activities. Mercier et al. (2023) also emphasized designing learning experiences that improve attitudes and intentions toward physical activity.

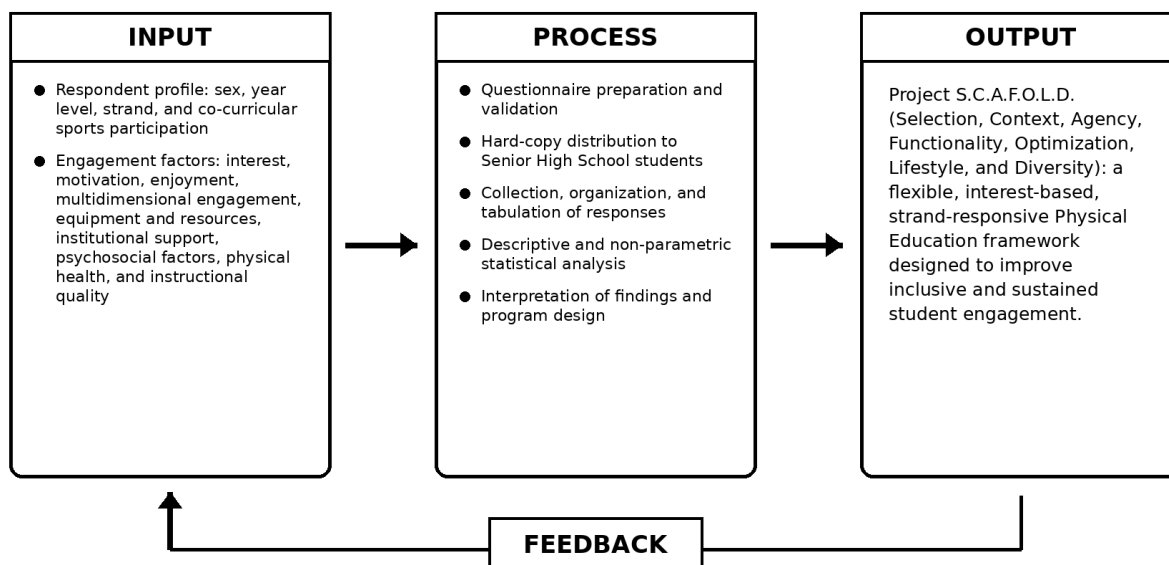
The literature supports a flexible, student-centered framework in which curriculum content, teaching approach, and available resources are coordinated. Tagare et al. (2025) argued that engagement dimensions are interconnected and should be addressed comprehensively rather than through isolated interventions. This provides a basis for designing Project S.C.A.F.O.L.D. as a program that links student selection and agency with context, functionality, resource optimization, lifestyle development, and diversity.

Conceptual Framework

The study used an Input-Process-Output model. The input consisted of the students' profiles and the personal, engagement, environmental, psychosocial, health, and instructional factors assessed in the study. The process included instrument preparation and validation, hard-copy administration, data organization, statistical analysis, and interpretation.

The output was Project S.C.A.F.O.L.D. (Selection, Context, Agency, Functionality, Optimization, Lifestyle, and Diversity), a student-centered Physical Education framework intended to replace rigid competition with flexible, interest-based, and strand-responsive modules. A feedback mechanism was included so that participation, enjoyment, autonomy, and implementation conditions could be reviewed and used to improve the program.

Figure 1. *Conceptual framework of the study*



METHODS

Research Design

The study used a descriptive-correlational design. Descriptive procedures summarized the respondents' characteristics and the extent to which personal, engagement, environmental, psychosocial, health, and instructional factors affected participation. Comparative non-parametric analyses were used to determine whether engagement factors differed across respondent profiles. The design was implemented as a census of the Senior High School population covered by the study.

Research Locale

The study was conducted at San Mateo Vocational and Industrial High School in San Andres, San Mateo, Isabela. The school offers Senior High School programs in Accountancy, Business and Management (ABM), Humanities and Social Sciences (HUMSS), and Technical-Vocational-Livelihood (TVL), providing an appropriate context for examining differences associated with academic strand and co-curricular sports participation.

Participants and Sampling Technique

All 430 Grade 11 and Grade 12 students were included through total enumeration or census sampling. The sample consisted of 226 Grade 11 and 204 Grade 12 students; 244 were female and 186 were male. By strand, 54 were enrolled in ABM, 159 in HUMSS, and 217 in TVL. A total of 187 students participated in co-curricular sports, whereas 243 did not.

Research Instrument

Data were obtained through selected student interviews and an adopted survey questionnaire based on the instruments of Padua et al. (2024) and Stringfellow et al. (2024). The questionnaire covered interest, personal motivation, enjoyment, agentic, cognitive, behavioral, and emotional engagement, equipment and resources, institutional support and facilities, psychosocial factors, physical health, and instructional quality. Responses were rated using a four-point scale.

Specialists in education and Physical Education reviewed the instrument for clarity, relevance, and alignment with the study objectives. Revisions were made based on their recommendations. The instrument was pilot-tested among students who were not included in the final sample, and Cronbach's alpha was computed to

examine internal consistency. The source manuscript reported that the validation and reliability procedures supported the instrument's use, although the exact coefficient was not stated.

Data Gathering Procedure

Permission was secured from the school administration before data collection. The school principal, Physical Education teachers, and class advisers assisted in coordinating the distribution and retrieval of hard-copy questionnaires during regular school hours. The purpose of the study and instructions for responding were explained, and the completed questionnaires were checked for completeness, encoded, tallied, and prepared for analysis.

Data Analysis

Frequency and percentage described the respondents' profile. Weighted mean, category mean, mean, and standard deviation summarized the factors affecting engagement. Means from 3.50 to 4.00 were interpreted as strongly agree or very great extent; 2.50 to 3.49 as agree or great extent; 1.50 to 2.49 as disagree or lesser extent; and 1.00 to 1.49 as strongly disagree or very little extent. The Mann-Whitney U test examined differences according to sex and co-curricular sports participation, while the Kruskal-Wallis H test assessed differences across ABM, HUMSS, and TVL. Post hoc comparisons identified strand pairs responsible for significant omnibus differences. Hypotheses were tested at the .05 level.

Ethical Considerations

Participation was voluntary, and students were informed that they could decline or withdraw without penalty. Parental or guardian consent was secured for respondents below 18 years of age, while respondents aged 18 years or older provided their own informed consent. Anonymity, confidentiality, and data privacy were maintained, and the information was used only for research. Administrative authorization was obtained, and data collection was scheduled to avoid disrupting classes.

RESULTS AND DISCUSSION

Profile of the Respondents

Table 1 shows that females represented 56.7% of the respondents, while males represented 43.3%. The grade-level distribution was relatively balanced. TVL constituted the largest strand at 50.5%, followed by HUMSS at 37.0% and ABM at 12.6%. More than half of the students (56.5%) did not participate in co-curricular sports, indicating that formal Physical Education classes were the principal organized activity setting for a majority of the sample.

Table 1. *Respondent profile (N = 430)*

Profile variable	Category	Frequency	Percentage
Sex	Male	186	43.3
	Female	244	56.7
Year level	Grade 11	226	52.6
	Grade 12	204	47.4
Academic strand	ABM	54	12.6
	HUMSS	159	37.0
	TVL	217	50.5
Co-curricular sports	Participated	187	43.5
	Did not participate	243	56.5

The large proportion of nonparticipants supports the need for a program that does not assume previous athletic experience. A conventional competitive-sport model may offer familiar opportunities to students already involved in sports while creating fewer entry points for those who are inactive, uncertain, physically constrained, or occupied by strand-specific workloads.

Factors Affecting Engagement in Physical Activities

The overall category mean was 3.21, interpreted as a great extent. Instructional quality obtained the highest mean (3.36) and was the only dimension interpreted as a very great extent. Motivation and enjoyment followed at 3.25 each, while interest was rated 3.22 and multidimensional engagement 3.21. Institutional support registered 3.19; equipment and resources and psychosocial support each obtained 3.18. Physical health had the lowest mean at 3.09, although it was still interpreted as affecting engagement to a great extent.

Table 2. *Summary of factors affecting engagement in physical activities*

Factor	Mean	Qualitative description	Interpretation
Interest in physical activities	3.22	Agree	Great extent
Personal motivation	3.25	Agree	Great extent
Enjoyment	3.25	Agree	Great extent
Multidimensional engagement	3.21	Agree	Great extent
Equipment and resources	3.18	Agree	Great extent
Institutional support and facilities	3.19	Agree	Great extent
Psychosocial factors	3.18	Agree	Great extent
Physical health factors	3.09	Agree	Great extent
Instructional quality	3.36	Strongly agree	Very great extent
Overall	3.21	Agree	Great extent

The strong rating for instructional quality indicates that clear directions, sufficient demonstrations, encouragement, fairness, approachability, and time for clarification were important facilitators. The highest item under this dimension was clarity of instructions ($M = 3.43$), followed by teacher encouragement and support ($M = 3.37$). These results are consistent with need-supportive teaching research showing that structure and interpersonal support promote motivation and engagement (Coterón et al., 2024; Leo et al., 2022; Xu et al., 2025).

Motivation and enjoyment were also prominent, reflecting the value of health improvement, stress release, personal goals, learning new skills, and positive peer interaction. This pattern supports Self-Determination Theory and evidence that enjoyment and interest help students internalize participation (Berki & Tarjányi, 2022; Lobo & Dimalanta, 2024). At the same time, students agreed that limited resources, inadequate facilities, funding constraints, psychosocial pressures, fatigue, health concerns, and physical discomfort affected participation. The lowest factor mean should not be interpreted as unimportant; rather, it identifies the dimension that may require more individualized adaptation and graded activity.

Differences According to Respondent Profile

The Mann-Whitney U results showed no significant differences between male and female students across the assessed factors (all $p > .05$). Thus, the null hypothesis was retained for sex. This suggests that the school's core engagement issues were broadly shared, even though particular activity preferences may still vary within each sex.

Strand comparisons produced a more differentiated pattern. Interest ($H = 5.01$, $p = .082$) and motivation ($H = 5.69$, $p = .058$) did not differ significantly. However, significant differences were found for enjoyment ($p = .024$), agentic engagement ($p < .001$), cognitive engagement ($p = .001$), behavioral engagement ($p = .001$), emotional engagement ($p = .005$), equipment and resources ($p = .003$), institutional support ($p < .001$), psychosocial support ($p = .012$), physical health ($p = .017$), and instructional quality ($p = .038$). HUMSS students generally had the highest means, whereas ABM students frequently had the lowest means. These differences support context-sensitive program design rather than a uniform activity package.

Co-curricular sports participation was the clearest source of difference. Students who participated in sports scored significantly higher than nonparticipants on all nine dimensions (all $p < .001$). The largest observed contrast was in multidimensional engagement (3.33 versus 2.80), followed by motivation (3.40 versus 3.06). The pattern indicates that previous participation provides skills, confidence, familiarity, and supportive routines that reinforce further engagement. Conversely, nonparticipants may be excluded from these reinforcing experiences, making an inclusive entry pathway necessary.

Table 3. *Summary of differences in engagement factors according to profile*

Profile grouping	Statistical result	Key pattern	Decision
Sex	All p-values > .05	No significant male-female differences across factors	Retain null hypothesis
Academic strand	Interest p = .082; motivation p = .058; other factors p < .05	HUMSS generally highest; ABM generally lowest	Partial rejection
Co-curricular sports participation	All factors p < .001	Participants scored higher than nonparticipants on every dimension	Reject null hypothesis

The strand results are compatible with research showing that activity engagement depends on the fit between student characteristics and the learning environment (Hu et al., 2021; Ma et al., 2024). The participation results also support structured, choice-oriented models that enable non-athletes to experience competence and autonomy rather than requiring them to enter activities at the same level as experienced sports participants (Silva et al., 2024).

Proposed Project S.C.A.F.O.L.D.

Project S.C.A.F.O.L.D. was designed from the combined descriptive and comparative findings. The acronym represents Selection, Context, Agency, Functionality, Optimization, Lifestyle, and Diversity. Selection gives students meaningful activity choices; Context aligns modules with strand demands and school conditions; Agency includes student voice and leadership; Functionality emphasizes practical movement and health; Optimization makes purposeful use of available resources; Lifestyle promotes sustainable habits; and Diversity accommodates differences in experience, gender, interest, and physical capacity.

The proposed intervention includes planning, implementation, and evaluation. Interest mapping and strand consultation are used to develop elective modules such as dance, yoga, high-intensity interval training with appropriate pacing, stress-relief activities, and ergonomic exercises for TVL students. Student-led sessions and flexible rotations are implemented over the school year. Monitoring focuses particularly on the 56.5% of respondents who were not previously involved in co-curricular sports, using attendance, engagement rubrics, feedback forms, and focus-group discussions.

Table 4. *Implementation framework for Project S.C.A.F.O.L.D.*

Phase	Objectives and major activities	Persons involved	Time frame	Resources
Planning	Conduct interest mapping; align schedules with ABM, HUMSS, and TVL; develop elective modules such as dance, yoga, HIIT, and functional fitness.	MAPEH Department, strand heads, school head, curriculum experts	Months 1-2	Survey forms, enrollment data, curriculum guides, digital templates
Implementation	Launch student-led sessions, flexible stress-relief rotations, and context-responsive tasks such as ergonomic exercise for TVL.	PE teachers, student leaders, learners	Months 3-8	Available sports facilities, audio equipment, mats, ergonomic guides
Evaluation	Monitor participation of previously inactive students; conduct satisfaction surveys and focus groups; refine modules through feedback.	LAC leader, research committee, teachers, students	Months 9-10	Attendance logs, engagement rubrics, evaluation tools, feedback forms

The framework responds directly to the study's finding that high-quality teaching alone does not remove structural and experiential barriers. It combines supportive pedagogy with differentiated activity design, resource planning, and systematic feedback. Such a comprehensive approach is consistent with evidence that engagement improves when program content, environment, teacher support, and student agency are addressed together (Tagare et al., 2025).

CONCLUSION

Senior High School students' engagement in physical activities was shaped by a combination of personal, instructional, environmental, psychosocial, and health-related factors. Instructional quality emerged as the strongest facilitator, while motivation and enjoyment also supported participation. However, limited resources and facilities, psychosocial constraints, physical discomfort, fatigue, and unequal prior exposure to sports continued to affect students' ability to engage consistently.

Engagement did not significantly differ according to sex, but it varied across academic strands for most dimensions and differed strongly according to co-curricular sports participation. HUMSS students generally obtained higher ratings, while students already involved in sports consistently reported stronger engagement than nonparticipants. The findings demonstrate that a single competitive-sport model is unlikely to serve the entire Senior High School population. Project S.C.A.F.O.L.D. contributes an evidence-based framework that combines student choice, strand responsiveness, functional activity, resource optimization, healthy lifestyle development, and diversity to make Physical Education more inclusive and sustainable.

Recommendation

The study findings should be formally presented to the school principal and relevant committees to support data-informed decisions on budget allocation, facility improvement, equipment acquisition, and differentiated PE offerings. The MAPEH Department should pilot Project S.C.A.F.O.L.D. through interest mapping, strand consultation, and elective activity modules that include competitive, recreational, wellness, stress-management, dance, and functional-fitness options.

Physical Education teachers should preserve the strengths identified in instructional quality by continuing clear explanations, demonstrations, encouragement, fairness, and opportunities for clarification. Activities should be progressively scaled for students experiencing pain, fatigue, injury, or low confidence. Additional entry-level and student-led opportunities should be created for non-athletes, who represented the majority of respondents.

The study process and findings should be shared through Learning Action Cell and MAPEH meetings to encourage collaboration and possible replication in other schools. Quarterly monitoring should track attendance, enjoyment, autonomy, participation across engagement dimensions, and student feedback. Future studies may examine the implementation and effectiveness of Project S.C.A.F.O.L.D. through quasi-experimental, longitudinal, or mixed-method designs and include objective physical-activity measures, additional schools, and socioeconomic variables.

References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Antunes, H., Rodrigues, A., Sabino, B., Alves, R., Correia, A. L., & Lopes, H. (2024). The effect of motivation on physical activity among middle and high school students. *Sports*, 12(6), 154.
- Berki, T., & Tarjányi, Z. (2022). The role of physical activity, enjoyment of physical activity, and school performance in learning motivation among high school students in Hungary. *Children*, 9(3), 320.
- Cachón-Zagalaz, J., Carrasco-Venturelli, H., Sánchez-Zafra, M., & Zagalaz-Sánchez, M. L. (2023). Motivation toward physical activity and healthy habits of adolescents: A systematic review. *Children*, 10(4), 659.
- Coterón, J., Fernández-Caballero, J., Martín-Hoz, L., & Franco, E. (2024). The interplay of structuring and controlling teaching styles in physical education and its impact on students' motivation and engagement. *Behavioral Sciences*, 14(9), 836.
- Deci, E. L., & Ryan, R. M. (2012). Self-determination theory. In P. A. M. Van Lange, A. W. Kruglanski, & E. T. Higgins (Eds.), *Handbook of theories of social psychology* (Vol. 1, pp. 416–436). SAGE.
- Deng, Y., Li, X., Huang, J., Haegele, J. A., Smith, B., Williams, T. L., & Li, C. (2025). School-based factors influencing physical activity participation in children and adolescents with disabilities: A qualitative systematic review and meta-synthesis. *Disability and Health Journal*, 18(1), 101707.
- Franco, E., Pérez-Calzado, E., & Coterón, J. (2025). How teachers' burnout shapes students' behavioural engagement in physical education: A multilevel perspective. *Acta Psychologica*, 260, 105627.

- Hu, D., Zhou, S., Crowley-McHattan, Z. J., & Liu, Z. (2021). Factors that influence participation in physical activity in school-aged children and adolescents: A systematic review from the social ecological model perspective. *International Journal of Environmental Research and Public Health*, 18(6), 3147.
- Kurniawan, R., Heynoek, F. P., Bakti, F. R. F. K., & Sigit, C. N. (2022). Motivation in physical education for junior high school students: A gender perspective. *Journal of Physical Education and Sport*, 22(12), 3072–3079.
- Leo, F. M., Mouratidis, A., Pulido, J. J., López-Gajardo, M. A., & Sánchez-Oliva, D. (2022). Perceived teachers' behavior and students' engagement in physical education: The mediating role of basic psychological needs and self-determined motivation. *Physical Education and Sport Pedagogy*, 27(1), 59–76.
- Lobo, J., & Dimalanta, G. (2024). Individual interest of students in physical education and school engagement in fostering physical culture inside the campus: The case of two prominent local colleges in Pampanga, Philippines. *Journal on Efficiency and Responsibility in Education and Science*, 17(1), 79–91.
- Ma, H., Li, X., Ma, C., & Teng, D. (2024). What are the important factors influencing the physical activity level of junior high school students: A cross-sectional survey. *Frontiers in Public Health*, 12, 1380290.
- Mercier, K., Simonton, K., Centeio, E., Barcelona, J., & Garn, A. (2023). Middle school students' attitudes toward physical activity and physical education, intentions, and physical activity behavior. *European Physical Education Review*, 29(1), 40–54.
- Padua, M. N., Quesada, A. L., & Galgo, A. C., Jr. (2024). Engagement and interest through physical activities among senior high school students at Muntinlupa National High School. *International Journal of Research and Innovation in Social Science*, 8(3S), 1352–1358. <https://doi.org/10.47772/IJRIS.2024.803098S>
- Prananto, K., Cahyadi, S., Lubis, F. Y., & Hinduan, Z. R. (2025). Perceived teacher support and student engagement among higher education students: A systematic literature review. *BMC Psychology*, 13(1), 112.
- Qin, L., Ho, W. K. Y., & Khoo, S. (2025). The relationship between perceived quality physical education and 7-day physical activity among secondary school students in China: The mediating role of exercise self-efficacy. *Archives of Public Health*, 83(1), 242.
- Reeve, J., Basarkod, G., Jang, H. R., Gargurevich, R., Jang, H., & Cheon, S. H. (2025). Specialized purpose of each type of student engagement: A meta-analysis. *Educational Psychology Review*, 37(1), 13.
- Silva, A. M., Estriga, M. L., Graça, A., MacPhail, A., & Batista, P. (2024). Enhancing high school students' engagement in physical activity through a fitness education model in physical education. *Journal of Physical Education and Sport*, 24(12), 2048–2059.
- Stringfellow, A., Wang, C. H., Farias, C. F., & Hastie, P. A. (2024). The development of an “Engagement in Physical Education” scale. *Frontiers in Sports and Active Living*, 6, 1460267.
- Tagare, R. L., Vergara, L. A., Porto, J. A., Hernani, M. R. A., & Gazali, N. (2025). Students' engagement in Philippine tertiary PE program: A path for enhancing experience and curriculum development. *International Journal of Evaluation and Research in Education*, 14(4), 3249–3259.
- Xiang, J., Guo, K., Gao, J., Gao, Y., & Liu, S. (2025). Exploring the mediating role of social support and learning engagement in the relationship between physical activity and academic achievement in secondary school students. *Frontiers in Psychology*, 16, 1387475.
- Xu, X., Abdullah, B. B., Samsudin, S. B., & Tan, Y. (2025). Pathway to learning engagement: Exploring teacher support, basic needs satisfaction, and academic self-efficacy in physical education among Chinese PE students. *Cogent Education*, 12(1), 2557604.