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"Making Gymnastics Enjoyable and Sustainable:" Positioning Gymnastics in Physical Education through Individual Interest Bolstering Study Engagement for a Lifelong and Healthy Lifestyle

Authors' contribution:

A) conception and design of the study
B) acquisition of data
C) analysis and interpretation of data
D) manuscript preparation
E) obtaining funding

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Abstract

While individual interest has been widely associated with student engagement across academic domains, its role in specialized physical education courses like gymnastics remains underexplored in Philippine higher education. This study examined the association between students' individual interest in gymnastics and their study engagement in the subject. A total of 293 undergraduate students enrolled in a specialized physical education course that includes gymnastics at a state university in the Philippines participated in the study. Individual interest was conceptualized to three factors: positive affect and willingness to reengage (PAWR), stored utility value (SUV), and stored attainment value and knowledge-seeking intentions (SAVKSI). Multiple regression analysis revealed that overall individual interest in gymnastics is significantly associated with study engagement. However, when examined individually, only SUV showed a significant positive association, while PAWR and SAVKSI did not. These findings suggest that when students perceive the practical usefulness of gymnastics, particularly its contribution to fitness and long-term health, they are more likely to be academically engaged. Physical education instructors are thus encouraged to design lessons that highlight the real-life applicability of gymnastics to sustain student interest and engagement. Future research should explore how individual interest can be nurtured through innovative teaching approaches, integration of gymnastics with other movement disciplines, or across diverse student populations. This study supports the positioning of gymnastics as a sustainable component of university curricula to foster lifelong health promotion and active lifestyles.

Keywords: individual interest, gymnastics, physical education, study engagement

Introduction

In recent years, interest has been widely recognized as a critical motivational mechanism influencing students' school engagement, retention, and academic achievement (Urhahne & Wijnia, 2023). In Physical Education, students who demonstrate strong interest often show a high level of commitment to skill development, enthusiasm in sports performance, and consistent participation in challenging physical activities. Interest is a dynamic and multifaceted construct, typically conceptualized as either situational or individual. Situational interest is a temporary, externally triggered response characterized by heightened attention and enjoyment, while *individual interest* represents a more enduring, personally meaningful inclination toward a subject or activity over time (Rieger et al., 2022; Roure et al., 2021; Tatiana et al., 2023). Although both types of interest are significant, much of the existing research in PE focuses

on situational interest, which can be influenced by instructional design, novelty, and teaching strategies (Nuutila et al., 2020; Roure & Pasco, 2018b, 2018a). Instructors often structure their teaching to promote situational interest, and studies have shown its strong immediate impact on student engagement in PE (Pasco & Roure, 2022). However, individual interest, which is more deeply rooted in students' self-concept and long-term motivations, remains less explored in the context of specialized PE courses, particularly gymnastics. To understand the development of individual interest more deeply, this study draws on Hidi and Renninger (2006) Four-Phase Model of Interest. According to Rotgans and Schmidt (2017), this model explains how situational interest can evolve into a stable individual interest through sustained engagement and personal meaning. This theoretical framework is especially relevant to gymnastics education, where students face complex physical and cognitive challenges that require both emotional involvement and continued commitment (Wang et al., 2022). Applying this model within the context of gymnastics helps clarify how individual interest may foster long-term engagement despite the activity's demanding nature.

To frame this study conceptually, this research adopts Roure et al. (2021) tripartite model of individual interest, which encompasses three interrelated factors: *positive affect and willingness to reengage* (PAWR), *stored-utility value* (SUV), and *stored attainment value and knowledge-seeking intentions* (SAVKSI). This model provides a comprehensive foundation for understanding how individual interest manifests in specialized physical education settings such as gymnastics, which involve both cognitive and physical demands. Even though prior research has established the significance of these dimensions in general physical education, their application within gymnastics, is still limited. This study therefore aims to address this gap by investigating how these components of individual interest predict students' academic engagement in gymnastics-based coursework, providing context-specific insights for theory and practice.

This lack of empirical attention to individual interest in specific PE disciplines represents a notable gap in the literature. Particularly within Philippine higher education, where physical education is frequently regarded as a general curricular requirement rather than a subject of nuanced academic investigation. To address this gap, the present study examined how the distinct factors of individual interest serve as predictors of students' study engagement in gymnastics. By focusing on this specialized yet underexplored area of the PE curriculum, the study contributes context-specific evidence that enhances both theoretical understanding and pedagogical approaches for fostering sustained engagement in physical education.

Challenges in Sustaining Gymnastics Instruction in Higher Education

Despite its foundational role in physical education, gymnastics has experienced a notable decline in instructional presence across various higher education systems. In England, Robinson et al. (2020) conducted a qualitative study revealing that many PE teachers lacked both the confidence and competence to teach gymnastics, often due to insufficient training during their university programs. This has contributed to its marginalization in PE curricula, despite its value in developing physical literacy (Robinson et al., 2020). Similarly, in Brazil, Carbinatto and Nunomura (2016) highlighted assessment-related challenges and limited curricular time as significant barriers in delivering quality gymnastics education at the university level, particularly among pre-service PE teachers. In the Philippine context, Capangpangan et al. (2024) found that even Bachelor of Physical Education (BPEd) students, who are expected to become future PE teachers, reported minimal exposure to gymnastics as part of their training. The study revealed a disparity between curricular expectations and actual instructional delivery, reinforcing concerns about the preparedness of future educators to teach gymnastics confidently (Capangpangan et al., 2024). This underrepresentation across multiple countries underscores the need for more research and curriculum redesign efforts aimed at revitalizing gymnastics instruction, particularly within higher education environments.

Individual Interest and Study Engagement

Roure et al. (2021a) proposed a tripartite framework of individual interest comprising *positive affect and willingness to reengage* (PAWR), stored-utility value (SUV), and *stored attainment value and knowledge-seeking intentions* (SAVKSI). PAWR reflects the student's enjoyment and emotional satisfaction with the content, making them more likely to return to the activity (Renninger & Hidi, 2022). SUV pertains to the perceived usefulness of the activity in achieving personal goals such as health and fitness (Rochnia & Gräsel, 2022), while SAVKSI refers to how the subject aligns with students' identities and future aspirations (Scott et al., 2022). These dimensions are especially relevant in gymnastics, where personal commitment, physical skill development, and identity formation converge. Gymnastics was selected as the focal content area due to its physical and cognitive complexity, its inclusion in the PATH-Fit 2 curriculum in the Philippines, and its distinct role in developing foundational movement skills. Despite its importance, students

often perceive gymnastics as demanding or intimidating, making it an ideal context to study the predictive role of individual interest in fostering academic engagement in PE. On the one hand, study engagement encompasses the vigor, dedication, and absorption students exhibit in academic tasks (Fredricks et al., 2004; Jaya & Ariyanto, 2021). Vigor refers to high energy and persistence; dedication reflects meaningful involvement and enthusiasm; and absorption describes a deep focus and immersion in learning (Mérida-López et al., 2021; Teuber et al., 2021). These dimensions are essential indicators of academic investment and have been shown to be significantly influenced by students' intrinsic motivations, including interest.

Although situational interest is often linked to engagement, evidence increasingly shows that individual interest also plays a significant role in fostering deep and sustained student involvement. Research in the Philippine context by Lobo et al. (2023a, 2023b) and Bautista et al. (2023) revealed that individual interest, specifically its affective and cognitive components, is strongly associated with academic engagement across diverse PE settings. Their findings suggest that PAWR, SUV, and SAVKSI are meaningful predictors of student engagement. However, these studies investigated PE as a general subject and did not isolate gymnastics as a distinct content area. This gap is noteworthy, as gymnastics is a specialized PE activity that requires focus, persistence, and physical coordination, making it a compelling domain for exploring individual interest. By clarifying the predictive relationships between interest dimensions and engagement in this unique context, the study provides context-specific insights that can inform the design of PE programs tailored to enhance student motivation and long-term participation.

Research Objectives and Hypotheses Formulation

This study assessed the association between students' individual interest in gymnastics and their perceived study engagement during gymnastics instruction within the PE curriculum. By focusing on a specialized physical education (PE) component, this research extends existing literature on interest-based motivation and engagement. Furthermore, this study also aims to offer implications for curriculum development, instructional design, and the promotion of lifelong participation in physical activity. Anchored in the tripartite model of individual interest by Roure et al. (2021), the study investigates how three factors of individual interest predict students' engagement during their participation in gymnastics-based coursework.

Additionally, although the measure of engagement used in this study reflects general academic involvement, it was administered within the context of students' gymnastics instruction. Participants were instructed to respond based on their experiences in this course, allowing engagement to be interpreted in relation to gymnastics content. This contextual framing enables the study to align its hypotheses with the learning environment under investigation. In line with the study's conceptual model, the following hypotheses were formulated (see Figure 1):

- **H_1:** Students' individual interest in gymnastics predicts their study engagement in gymnastics-based PE instruction.
  - **H_{1a}:** Positive affect and willingness to reengage predicts study engagement in gymnastics.
  - **H_{1b}:** Stored utility value predicts study engagement in gymnastics
  - **H_{1c}:** Stored-attainment value and knowledge seeking intentions predicts study engagement in gymnastics

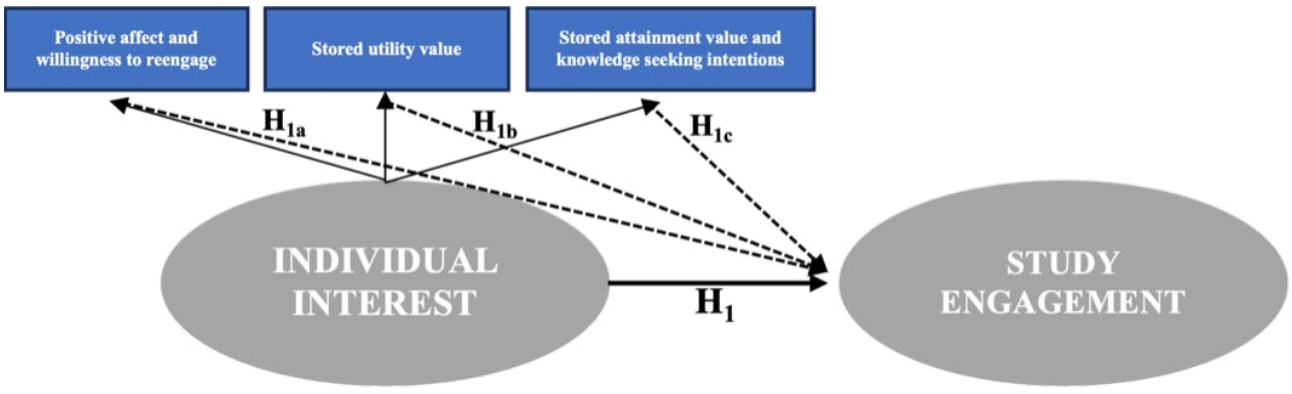

Figure 1. Conceptual framework depicting the relationship between individual interest on gymnastics and study engagement

Methods

Research Design

This study utilized a quantitative, predictive-correlational research design to examine how individual interest and its three components (PAWR, SUV, and SAVKSI) is correlated to students' study engagement in gymnastics. Predictive designs are useful when forecasting outcomes based on the relationships among variables (van Witteloostuijn et al., 2022). In this context, the study aims to determine the extent to which students' interest (based on the factors of individual interest) in gymnastics can predict their engagement in the subject.

Participants and Sampling Technique

The participants were undergraduate students enrolled in Physical Education 2, also known as Physical Activity Towards Health and Fitness 2 (PATH-Fit 2), from a selected public higher education institution in the Philippines. This course, which typically serves as a general education requirement, is offered to first-year college students across various degree programs. Classes are usually held once a week for two (2) hours over a 16-week semester. Furthermore, *purposive sampling technique* was employed to intentionally select participants who met the relevant criteria for this study (Thomas, 2022). Data collection took place from January to February 2024. The inclusion criteria were as follows: (1) currently enrolled as a student at the selected institution, (2) actively enrolled in PATH-Fit 2 with gymnastics as the focal content, and (3) aged 19 years or older. No restrictions were applied regarding participants' sex or gender identity to promote diverse and equitable participation in the study. A total of 343 responses were received, with 293 retained after data cleaning, yielding an 85.42% valid response rate. The majority of participants identified as heterosexual women, followed by heterosexual men, LGBTQIAP+ individuals (8.9%), and some who preferred not to disclose their gender identity.

Table 1. Distribution of responses based on respondents' sex/gender identity (N = 293)

Variable	Item	N(%)
Sex/gender identity	Heterosexual men	*120*(41.0%)
	Heterosexual women	*143*(48.8%)
	LGBTQIAP+	*26*(8.9%)
	Prefer not to say	*4*(1.4%)

Instrument

The research instrument was divided into three parts. The first part captured the respondents' sex/gender identity. The second part utilized the Students' Individual Interest in Physical Education Questionnaire developed by Roure et al. (2021). This 14-item instrument measures three dimensions of individual interest: PAWR (e.g., "If gymnastics lessons could be longer, I would be happy."), SUV (e.g., "What I learn in gymnastics is useful for what I do outside of school."), and SAVKSI (e.g., "I like to challenge myself and learn new things in gymnastics."). Responses were recorded on a 5-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"). The third part employed the Utrecht Work Engagement Scale for Students (UWES-9S) developed by Carmona-Halty et al. (2019). This 9-item scale measures study engagement through three subdimensions: vigor (e.g., "I feel energetic and capable when I'm studying or going to class."), dedication (e.g., "When I get up in the morning, I feel like going to class."), and absorption (e.g., "I am immersed in my studies."). Responses were recorded using a 7-point Likert scale ranging from 0 ("never") to 6 ("always"). For this particular construct, a composite score was used. The UWES-9S is a general academic engagement measure not originally designed for subject-specific contexts such as gymnastics. In this study, the UWES-9S items were interpreted in relation to students' experiences within their gymnastics coursework to capture relevant engagement dimensions. However, no additional content validation procedures (e.g., expert review, pilot testing) were conducted to specifically confirm its suitability for gymnastics instruction. Consequently, the content validity of the UWES-9S in this context may be limited, and findings should be interpreted with caution regarding this methodological constraint.

In this regard, to empirically assess the measurement instruments' applicability and psychometric soundness within the gymnastics context in Philippine higher education, confirmatory factor analysis (CFA) was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4. This step was essential to ensure that the constructs of individual interest and study engagement, originally developed in broader academic settings, remained psychometrically sound in the specific domain of physical education. First, convergent validity was evaluated using standardized factor loadings, Cronbach's alpha (CA), composite reliability (CR), average variance extracted (AVE), and variance inflation factors (VIF), following the recommendations of Hair et al. (2021) (see Table 2). All item loadings were ≥ 0.70, ranging from 0.738 to 0.926, indicating strong indicator reliability. Internal consistency was also confirmed, with CA values ranging from 0.845 to 0.913 and CR values between 0.915 and 0.993, all ≥ 0.70, satisfying the thresholds for construct reliability (Hair et al., 2021). AVE values were all ≥ 0.50, demonstrating that each construct explained more than half of the variance in its indicators, thus supporting

convergent validity (Fornell & Larcker, 1981). Moreover, all VIF values were ≤ 5.0, indicating no multicollinearity issues among the items (Hair et al., 2021). Thus, convergent validity has been established.

Table 2. Convergent Validity Results of the Measurement Model (PLS-SEM)

Construct	Item	Item loadings	CA	CR	AVE	VIF
PAWR	PAWR2	0.757	0.845	0.993	0.751	1.840
	PAWR3	0.926				2.148
	PAWR4	0.907				2.797
SUV	SUV1	0.776	0.856	0.915	0.687	2.243
	SUV2	0.840				1.763
	SUV3	0.807				2.338
	SUV4	0.887				2.159
SAVKSI	SAVKSI1	0.785	0.913	0.916	0.743	2.356
	SAVKSI2	0.866				3.369
	SAVKSI3	0.888				3.362
	SAVKSI4	0.875				3.892
	SAVKSI5	0.890				3.162
SE	SE1	0.738	0.909	0.931	0.645	1.633
	SE2	0.783				2.565
	SE3	0.883				3.783
	SE4	0.801				2.489
	SE7	0.778				2.247
	SE8	0.874				2.897
	SE9	0.752				1.930

Note: Item loadings > 0.70, Cronbach's Alpha (CA) and Composite Reliability (CR) > 0.70, AVE (Average Variance Extracted) > 0.50, VIF (Variance Inflation Factor) < 5.0; PAWR- Positive affect and willingness to reengage, SUV- Stored-utility value, SAVKSI- Stored-attainment value and knowledge-seeking intentions, SE- Study Engagement.

Furthermore, discriminant validity was evaluated using both the Fornell–Larcker criterion and the Heterotrait–Monotrait (HTMT) ratio (see Table 3). The square roots of the AVE values (diagonal entries) were all greater than the corresponding inter-construct correlations, thereby satisfying the Fornell–Larcker criterion (Fornell & Larcker, 1981). HTMT values ranged from 0.202 to 0.899, all ≤ 0.90, which meets the liberal threshold recommended by (Henseler et al., 2015). Although the HTMT value between PAWR and SUV (0.899) approached the conservative threshold of ≤ 0.85 (Roemer et al., 2021), it remained below the liberal cutoff of ≤ 0.90 (Roemer et al., 2021), and is acceptable given the constructs' conceptual relatedness as dimensions of individual interest. Therefore, discriminant validity has been established.

Table 3. Discriminant Validity Assessment of the Measurement Model

	SE	PAWR	SAVKSI	SUV
	Fornell-Larcker Criterion			
SE	0.803			
PAWR	0.203	0.867		
SAVKSI	0.240	0.509	0.862	
SUV	0.306	0.747	0.540	0.829

	SE	PAWR	SAVKSI	SUV
	Heterotrait-Monotrait Ratio (HTMT)			
SE				
PAWR	0.202			
SAVKSI	0.234	0.577		
SUV	0.304	0.899	0.638	

Note: HTMT ratio value < 0.85 (conservative) < 0.90 (liberal) approach; SE – Study engagement; PAWR- Positive affect and willingness to reengage, SAVKSI- Stored-attainment value and knowledge-seeking intentions, SUV- Stored-utility value.

Statistical Analysis

To describe the distribution of data of responses based on sex/gender identity, descriptive statistics such as frequency and percentage were used. Finally, to determine the relationship between individual interest, along with its three factors, to study engagement, multiple regression analysis has been performed.

Results

The results of the multiple regression analysis are summarized in Table 4 and illustrated in Figure 2. The analysis revealed that overall individual interest in gymnastics significantly predicts students' study engagement, indicating that students with higher levels of interest tend to be more engaged in their gymnastics classes [$F(3, 289) = 8.211$, $p < .001$]. The coefficient of determination ($R^2 = 0.079$) suggests that 7.9% of the variance in study engagement can be explained by individual interest and its three factors. While this percentage is modest, it still reflects a meaningful relationship between interest and engagement, particularly in the context of physical education, where multiple external factors may influence students' motivation. Hence, H_1 has been supported.

Furthermore, to determine the contribution of each factor of individual interest, the standardized regression coefficients (β) were examined. Positive affect and willingness to reengage (PAWR) did not significantly predict study engagement ($\beta = –0.096$, $t_{value} = –0.980$, $p = .328$), indicating that enjoyment or positive emotions alone do not necessarily lead to higher academic involvement in gymnastics. Similarly, stored attainment value and knowledge-seeking intentions (SAVKSI) were not significantly related to study engagement ($\beta = 0.107$, $t_{value} = 1.435$, $p = .152$), suggesting that students' intrinsic goals or self-schema alignment with gymnastics may not be sufficient to drive consistent engagement. Hence, hypotheses H_{1a} and H_{1c} were not supported.

In contrast, stored utility value (SUV) emerged as a significant predictor of study engagement ($\beta = 0.307$, $t_{value} = 2.956$, $p = .003$), supporting H1b. This finding indicates that students are more likely to engage in gymnastics when they perceive its practical value and real-world applicability. Among the three factors of individual interest, SUV demonstrated the strongest positive predictive power on study engagement, reinforcing the notion that students' beliefs about the usefulness of learning content are key drivers of sustained motivation and participation. From a pedagogical standpoint, this underscores the importance of emphasizing the transferable benefits of gymnastics, such as improved physical literacy, injury prevention, enhanced mobility, and foundational strength that can support lifelong activity.

Table 4. Direct influence of individual interest to study engagement: Multiple regression analysis and hypotheses testing

Hypothesis	Paths	β	R^2	F	*t*-value	*p*-value	Decision
H_1	INDINT → SE	-	.079	8.211	-	<.001	Supported
H_{1a}	PAWR → SE	-.096	-	-	-.980	.328	Rejected
H_{1b}	SUV → SE	.307	-	-	2.956	.003	Supported
H_{1c}	SAVKSI → SE	.107	-	-	1.435	.152	Rejected

Note: Significance is p < .05; INDINT- Individual interest, PAWR- Positive affect and willingness to reengage, SUV- Stored-utility value, SAVKSI- Stored-attainment value and knowledge-seeking intentions, SE- Study Engagement

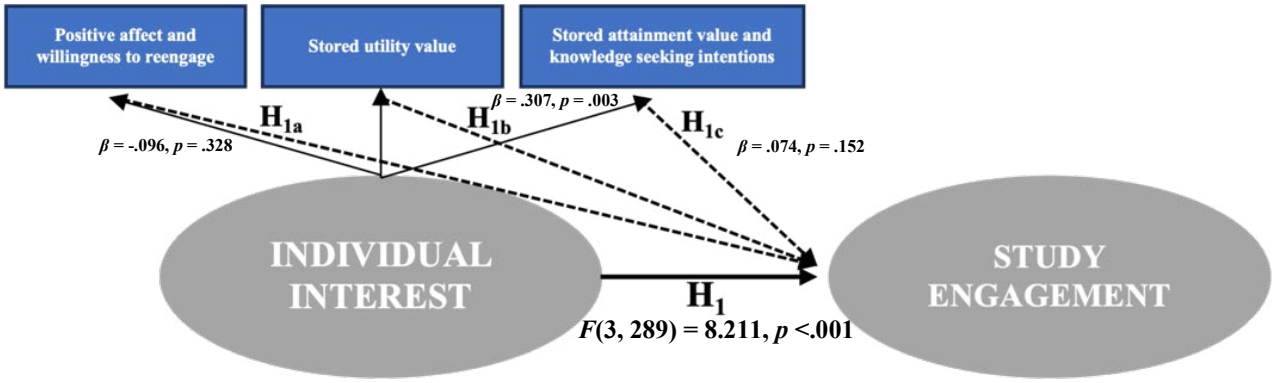

Figure 1. Regression model results

Discussion

The present study investigated the relationship between students' individual interest in gymnastics and their level of study engagement, focusing on three core factors. The overall model was statistically significant, indicating that individual interest predicts student engagement in specialized physical education settings. However, only SUV emerged as a significant individual predictor. This suggests that while students may experience enjoyment (PAWR) or have internal goals (SAVKSI) related to gymnastics, these alone may not lead to consistent study engagement unless the activity is perceived as useful or meaningful in broader life contexts. The significant role of SUV reflects the motivational strength of instrumental value. It is the belief that gymnastics skills have practical relevance beyond the classroom. The model accounted for 7.9% of the variance in study engagement, a modest but meaningful effect given the multifactorial nature of motivation in behavioral sciences. These findings affirm individual interest as a key factor shaping students' involvement, particularly in cognitively and physically demanding disciplines such as gymnastics. Most importantly, this study contributes novel insights into the understanding of individual interest and engagement in gymnastics within Philippine higher education. By focusing on a specialized and underexplored physical education domain, it offers valuable evidence that can help reframe gymnastics as a sustainable component of the PE curriculum, thereby promoting long-term student motivation and participation.

These findings partially align with prior research highlighting personal interest as a critical driver of student engagement across educational domains (Schnitzler et al., 2021; Yang et al., 2023; Zhao et al., 2021). Educational psychology theories posit that intrinsic interest fosters persistence, deeper cognitive involvement, and higher emotional investment (Duda & Appleton, 2016). However, this study's finding that only the utility-oriented dimension (SUV) predicted engagement in gymnastics diverges from some prior work in general physical education contexts, including that of Lobo et al. (2023a, 2023b) and Bautista et al. (2023), where affective and attainment components (PAWR and SAVKSI) were also significant predictors. This divergence likely reflects the unique nature of gymnastics, which is often viewed as a high-demand, technique-intensive, and potentially intimidating discipline. Students new to gymnastics may experience anxiety or hesitation related to physical skill demands, safety concerns, or body exposure (Fierro-Suero et al., 2023; Martinek et al., 2019). Under such conditions, perceived competence and the practical utility of gymnastics may exert greater influence on engagement than enjoyment or curiosity alone. Environmental and contextual factors such as equipment availability, quality of instruction, and peer support also shape motivational dynamics in gymnastics (Li & Xue, 2023). These findings underscore that motivational drivers in physical education can be activity-specific rather than universally generalizable. Moreover, in collectivist cultures like the Philippines (Aruta et al., 2019), external validation and practical outcomes often have heightened importance in motivating student behavior (Li & Shao, 2022). This cultural lens helps explain the prominence of utility value in predicting engagement, where students are motivated by perceived benefits to health, social expectations, or future careers (Avdonina et al., 2019).

Practical Implications

The consistent predictive role of stored utility value (SUV) underscores the importance of perceived usefulness in fostering student engagement in gymnastics. To capitalize on this, teachers can frame gymnastics lessons around practical, real-life applications such as injury prevention techniques, core strength development, and improving functional fitness for daily activities (Cronin-

Golomb & Bauer, 2023; Trajković et al., 2016). Integrating interdisciplinary themes, including wellness education, biomechanics and rehabilitation, can further highlight gymnastics' broader relevance to students' academic and personal goals (Budiarti et al., 2020; Chao, 2020; Jurat et al., 2024). Educators should also employ culturally responsive teaching methods that acknowledge students' diverse backgrounds and motivations (Flory et al., 2023; Wrench & Garrett, 2021), even in gymnastics (Oliveira et al., 2018). Providing individualized encouragement and scaffolding skills progressively can help students overcome initial anxiety or difficulty (Acosta-Gonzaga & Ramirez-Arellano, 2022; Ribeiro et al., 2024), fostering a supportive learning environment that sustains engagement despite the discipline's physical and cognitive challenges.

In a broader educational context, these findings suggest that perceived usefulness, more than enjoyment or challenge-seeking, may be a more actionable lever for promoting engagement. This is especially true in courses like gymnastics that some students may initially perceive as difficult or intimidating. When PE instructors intentionally highlight relevance and long-term benefits, they foster not just short-term participation but a mindset oriented toward lifelong physical activity. In a nutshell, while not all facets of individual interest significantly predict engagement on their own, the combined model plays an important role in shaping how students interact with the learning process in physical education. Fostering utility value may thus serve as a highly practical and evidence-based strategy for enhancing commitment, effort and persistence in PE settings.

Future Research Directions

These results suggest that individual interest's influence varies by subdimension and activity context. Future research should examine potential mediators and moderators such as perceived competence, autonomy support, fear of failure, and social belongingness. Longitudinal designs and qualitative methods could elucidate how interest evolves and influences engagement over time. Given the specialized nature of gymnastics, extending this model to other specialized physical education units (e.g., martial arts, aquatics, dance) would assess its generalizability. Additionally, exploring how instructors' communication and instructional adaptations impact students' perceptions of utility could inform professional development initiatives. Lastly, even though the UWES-9S scale was used as an alternative for measuring engagement, future studies may benefit from developing or validating engagement instruments tailored specifically to gymnastics or movement-based education.

Conclusion

This study contributes to the understanding of student engagement in physical education by identifying SUV as a significant predictor of study engagement in gymnastics. Among the three components of individual interest, only SUV showed a statistically significant relationship with students' engagement, while PAWR and SAVKSI did not. These findings suggest that students are more likely to engage with gymnastics content when they perceive its usefulness in supporting their personal health, physical literacy, or long-term goals. This highlights the importance of instructional approaches that frame gymnastics not only as a skill-based requirement but also as a meaningful contributor to students' broader life outcomes. Physical education instructors may enhance engagement by emphasizing the practical applications of gymnastics (e.g., such as core strength, injury prevention and functional mobility) thus strengthening students' recognition of its real-world value. When students perceive a subject as useful, their academic participation is more likely to be sustained and purposeful.

On the other hand, the findings must be interpreted within the limitations of the study. First, this study was conducted within a single public higher education institution in the Philippines. This may limit the generalizability of the model across other educational contexts and physical education disciplines. Second, although the UWES-9S was contextually interpreted to reflect engagement specifically within gymnastics instruction, it was originally developed as a general academic engagement instrument and was not specifically designed for subject- or activity-specific contexts such as gymnastics. The study did not conduct additional content validation procedures (e.g., expert review or pilot testing) to verify the scale's suitability in this specialized context, which may limit the content validity of the engagement measurement. Therefore, results should be interpreted with this methodological limitation in mind. Moving forward, subsequent studies may benefit from the development and validation of engagement instruments tailored specifically to physical education courses such as gymnastics to better capture context-specific student involvement.

Additionally, future studies are encouraged to replicate this model in varied institutional settings and among more diverse student populations. Longitudinal studies could explore how perceptions of utility evolve over time and whether sustained recognition of value leads to more consistent engagement. Additionally, experimental or intervention-based research may assess the effectiveness of targeted strategies to enhance perceived utility and thereby improve student engagement in gymnastics and other specialized physical education courses. Curriculum redesign efforts that explicitly integrate utility

value and culturally relevant content may further support sustained motivation and participation. Further research should also investigate additional predictors or mediating variables, such as instructional support, self-efficacy, or social belongingness, to understand how these factors interact with individual interest to shape engagement in physical activity courses. Applying the same theoretical framework to other specialized physical education subjects (e.g., martial arts, dance, aquatics) could help validate its generalizability and refine strategies for enhancing student motivation across diverse physical education contexts. In summary, this study establishes that individual interest, particularly through its utility-based component, holds predictive value in understanding students' engagement in gymnastics. This reinforces the importance of aligning physical education content with students' perceived goals and life relevance to promote sustained academic participation and support long-term wellness outcomes.

Positioning Philippine Studies in the Global Body of Literature

This study contributes to the evolving discourse on student engagement and motivation by representing a Philippine context within the broader global research landscape. While much of the existing literature on individual interest and academic engagement originates from Western or high-income educational systems (e.g., Europe, North America), this study provides valuable empirical evidence from Southeast Asia, where physical education is often underexplored in psychological and motivational terms. By examining Filipino students' perceptions of gymnastics and how these relate to their engagement, this research addresses a notable gap in cross-cultural validation of interest-based models in physical education. The predictive role of SUV in this study aligns with international findings that emphasize the centrality of perceived usefulness in sustaining student motivation, thereby reinforcing the cross-cultural relevance of utility-based interest dimensions. However, the non-significant relationships of PAWR and SAVKSI may also reflect unique cultural, curricular, or institutional dynamics in Philippine higher education, particularly where PE is still transitioning from being viewed as a co-curricular requirement to a structured, outcome-oriented discipline. By situating these findings within a Filipino university setting, this study invites further regional and international scholarship to explore the variability of motivational constructs across contexts. It underscores the value of generating localized evidence that not only informs national pedagogy and policy but also contributes to the refinement of global theoretical models. As such, the current research serves as both a contextualized analysis and a building block toward more inclusive, globally representative understandings of physical education engagement.

Ethics approval and informed consent

Highest Ethical considerations were strictly followed in the conduct of the study. The data gathering was conducted through online survey using Google Forms. In the Google Forms, the purpose of the study, inclusion criteria, instruments to be used, and the components/variables which will only be measured in the entire conduct of the study are presented. Additionally, the researchers provided the benefits of the study to the institution, community, and its contribution to scientific knowledge. The online survey underlined that participating in the study is voluntary, and respondents can choose to withdraw at any moment. The respondents were similarly advised of the potential minor hazards associated with their involvement in the research, including the experience of unease when responding to personal and/or sensitive survey inquiries. In addition, respondents were informed that there is no monetary compensation associated with providing information for the study. The respondents were additionally informed regarding the information that would be gathered via Google Forms and transferred to an Excel file for evaluation. The protected password for this data was disclosed, with only the researchers granted personal access to it. Additionally, they were informed that the aforementioned data would be stored on a USB drive for a duration of three (3) months, after which it would be irrevocably removed from the system. Additionally, respondents were notified that the data that was obtained would no longer be utilized in any subsequent or secondary research. Withdrawal of respondents' participation in the study will not have any adverse effects on their relationships with the involved researchers or research organizations, nor will it affect their contributions to any future services or current programs. In order to maintain the anonymity and confidentiality of the respondents, their identities and names were withheld throughout the data collection, analysis, and reporting of the study's findings. Due to the aforementioned conditions, respondents were at any moment permitted to withdraw from the study or request a debriefing. All respondents' information were securely protected in accordance with the Data Privacy Act of 2012, also known as Republic Act 10173.

Competing Interests

The author declares no conflict of interest.

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