

## **“The ‘double sinawali’ of learning and striking the stick with purpose”: Exploring the relationship between individual interest and study engagement in the indigenous martial art of Arnis**

Joseph Lobo <sup>1</sup>  
*Bulacan State University, Philippines*

**Abstract:** This study examined the association between individual interest and study engagement in Arnis-based physical education within the higher education context. Anchored in Self-Determination Theory (SDT) and Expectancy-Value Theory (EVT), it investigated three factors of individual interest: positive effect and willingness to reengage (PAWR), stored-utility Value (SUV) and stored attainment value and knowledge-seeking intentions (SAVKSI). A cross-sectional survey of university students was analyzed using multiple regression. Results showed that SAVKSI had the strongest positive association with engagement, followed by SUV, while PAWR did not demonstrate a significant link. These findings indicate that in culturally rooted, skill-intensive PE contexts, personal importance and knowledge-oriented goals are more strongly associated with sustained engagement than enjoyment alone. The study offers theoretical, pedagogical, cultural and policy implications, reinforcing the value of integrating indigenous martial arts into higher education PE to enhance motivation and preserve cultural heritage.

**Keywords:** Arnis, higher education, individual interest, intersectionality, physical education, study engagement

Arnis, the national martial art and sport of the Philippines, holds a distinctive place in both cultural heritage and physical education (Lobo, 2025c; Martin & Santos, 2019). Recognized under Republic Act 9850 (National Commission for Culture and the Arts, 2017), Arnis is celebrated not only as a competitive discipline but also to foster discipline, improve physical fitness and preserve indigenous knowledge systems (Pacres, 2025). In higher education, the integration of Arnis into the physical education curriculum represents a unique convergence of skill acquisition, cultural identity and holistic student development (Peralta, 2025). As a weapon-based martial art, it offers a repertoire of drills, forms and sparring activities that challenge learners to develop coordination, timing and tactical awareness (Masagca, 2024). Among these, the Double Sinawali drill is especially emblematic. Its weaving, rhythmic pattern encapsulates the harmony and precision that effective Arnis practice demands, a symbolism that will be further explored in the context of this study.

The concept of engagement has its roots in organizational psychology through the construction of work engagement. It is defined by Schaufeli et al. (2002) as a positive, fulfilling, work-related state of mind characterized by vigor, dedication and absorption. Recognizing parallels between workplace and academic demands, this model was adapted to the educational

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<sup>1</sup> Corresponding author; College of Sports, Exercise and Recreation, Bulacan State University, McArthur Highway, Guinhawa, City of Malolos, 3000, Bulacan, Philippines. Email address: [joseph.lobo@bulsu.edu.ph](mailto:joseph.lobo@bulsu.edu.ph)

context as study engagement (Carmona-Halty et al., 2019; Schaufeli et al., 2002), retaining its three core dimensions but reorienting them toward learning tasks. In physical education, study engagement is essential for sustaining effort, enthusiasm and immersion (Curran & Standage, 2017; Deveci Şirin & Şirin, 2015). The physical rigor, mental focus and cultural significance of Arnis-based PE create a compelling setting for examining how engagement manifests and how it can be fostered through motivational factors.

One motivational factor is individual interest, defined as an enduring predisposition to engage with a particular activity over time (A. K. Renninger, 2000). Roure et al. (2021) Tripartite Model conceptualizes individual interest in three interrelated factors: positive affect and willingness to reengage (PAWR), stored utility value (SUV), and stored attainment value and knowledge-seeking intentions (SAVKSI). In the physical education setting, individual interest sustains participation, deepens enjoyment and fosters personal investment in learning despite challenges inherent in skill-based activities (Lobo, Peralta, et al., 2023). Empirical studies in various PE contexts, including dance i.e., Philippine traditional dances (Lobo, 2023) and hip-hop (Lobo, 2025a) and gymnastics (Lobo, 2025d), have consistently shown that higher individual interest is associated with greater study engagement, suggesting a potentially reinforcing relationship between the two constructs.

Despite these insights, no empirical evidence has examined the relationship between individual interest and study engagement in the context of Arnis or other indigenous martial arts. Furthermore, while validated tools such as the Utrecht Work Engagement Scale for student's short version (UWES-9S) (Carmona-Halty et al., 2019) exist for measuring study engagement in general academic and PE contexts, there is currently no engagement instrument specifically designed for Arnis. This absence underscores the need to contextualize existing measures and explore how engagement operates within the cultural and technical demands of Arnis instruction. Addressing this gap may provide more nuanced insights into the motivational and engagement dynamics unique to indigenous martial arts-based PE. These motivational perspectives are further framed by Self-Determination Theory (Deci & Ryan, 1985) and Expectancy-Value Theory (Eccles & Wigfield, 2002), which together provide a lens for understanding how Filipino learners' motivation and engagement are shaped by cultural identity, collective values such as pakikipagkapwa and pride in preserving indigenous heritage through Arnis.

Accordingly, this study aims to explore the predictive relationship between individual interest and study engagement among college students enrolled in Arnis-based physical education classes. Specifically, it examines how PAWR, SUV and SAVKSI predict the overall level of study engagement, operationalized through vigor, dedication and absorption. By situating the analysis within the cultural and pedagogical context of Arnis, this research contributes to the broader understanding of how motivation and engagement interact in skill-based, heritage-rooted PE, while also laying the groundwork for developing more culturally responsive engagement measurement tools. Rather than replicating prior work, the present study forms part of a programmatic line of inquiry that examines how individual interest and engagement operate across substantively different physical education contexts.

### ***Arnis in Physical Education***

Arnis is both a competitive discipline and a cultural heritage practice (History of Filipino Martial Arts – Philippine Eskrima Kali Arnis Federation, n.d.). Its integration into the physical education (PE) curriculum reflects the country's commitment to promoting physical fitness, motor skill development and national identity (Vidal et al., 2021). As a weapon-based martial art, Arnis offers a range of drills, forms and sparring activities that develop coordination, timing and tactical awareness (Lipardo et al., 2022). Beyond physical benefits, it cultivates

socio-emotional competencies such as discipline, respect and perseverance (Peralta, 2025), while also deepening students' appreciation of indigenous Filipino traditions (Santos et al., 2023). The unique blend of technical skill development and cultural preservation positions Arnis as an ideal subject for examining the interplay of motivation and engagement in PE.

### ***Individual interest in Physical Education***

Individual interest refers to a learner's enduring predisposition to engage with a particular activity, influenced by personal relevance, enjoyment, and perceived value (Mägdefrau et al., 2025; K. A. Renninger & Hidi, 2015). Roure et al. (2021) Tripartite Model conceptualizes individual interest through three interrelated factors: positive affect and willingness to reengage (PAWR), reflecting enjoyment and readiness to participate again (Roure & Lentillon-Kaestner, 2022); stored utility value (SUV), indicating the perceived usefulness of the activity for current or future goals (Roure & Lentillon-Kaestner, 2022); and stored attainment value and knowledge-seeking intentions (SAVKSI), signifying the importance attached to mastering the activity and expanding related knowledge (Roure & Lentillon-Kaestner, 2022).

International studies in physical education and sport contexts also affirm that students' long-term motivation depends on the alignment of perceived value, enjoyment and personal meaning (A. Chen & Darst, 2001; Sun & Chen, 2010; Xiang et al., 2006). Research in culturally diverse contexts highlights how interest evolves through competence and autonomy support (Cui et al., 2024; C. K. J. Wang et al., 2019), echoing self-determination theory and expectancy-value theory perspectives (Deci & Ryan, 1985; Eccles & Wigfield, 2002).

In the Philippine higher education context, individual interest has been empirically validated as a robust predictor of engagement (Lobo & Dimalanta, 2024). Large-scale studies involving more than 11,000 students (Lobo, Peralta, et al., 2023) and specialized investigations in dance (Lobo, 2023), hip-hop (Lobo, 2025a), gymnastics (Lobo, 2025d) and taekwondo (Lobo, 2025b) consistently demonstrate that higher individual interest is associated with greater persistence, skill proficiency, and deeper learning engagement. Collectively, these findings situate the construction as both a universal motivational mechanism and a culturally adaptive framework that thrives in skill-based, performance-oriented courses.

### ***The 'double sinawali' metaphor for individual interest and study engagement***

The relationship between individual interest and study engagement is well-supported by SDT (Deci & Ryan, 1985) and EVT (Eccles & Wigfield, 2002). SDT posits that intrinsic motivation, driven by autonomy, competence and relatedness, naturally fosters higher engagement (Ryan & Deci, 2000), while EVT emphasizes that perceived value and expectations of success sustain effort and commitment (Shang et al., 2023). In PE, students who enjoy an activity (PAWR), recognize its usefulness (SUV), and view mastery as personally significant (SAVKSI) are more likely to sustain energy, dedication, and immersion in learning. Prior studies in general PE (Lobo, Peralta, et al., 2023), Philippine traditional dances (Lobo, 2023), hip-hop (Lobo, 2025a), gymnastics (Lobo, 2025c) and taekwondo (Lobo, 2025b) have consistently shown that individual interest predicts study engagement, forming a mutually reinforcing cycle.

In Arnis, this relationship can be symbolized by the "double Sinawali" drill. It is a bilateral weaving pattern where alternating strikes from both hands create a continuous, rhythmic flow (Galang, 2012). In this study, the "double sinawali" is used as a culturally grounded metaphor to illustrate how individual interest and study engagement operate in coordination. Individual interest serves as the initiating strike, providing motivational drive,

while study engagement acts as the responding motion, sustaining and focusing that drive into productive learning efforts. Each “strike” reinforces the other, generating a rhythm that mirrors the physical execution of the drill. This framing aligns with SDT’s feedback loop between motivation and engagement (Grenier et al., 2024) and EVT’s principle that value and effort strengthen one another (Gao et al., 2008).

To extend this interpretation globally, similar approaches in martial arts education recognize how embodied, rhythmic practice cultivates cognitive and affective engagement (Channon & Jennings, 2014; Cynarski, 2013). In the broader context of indigenous pedagogy, movement-based learning is viewed as a cultural dialogue that connects heritage, identity, and motivation (Hutchison & McAlister-Shields, 2020; Wrench & Garrett, 2021). Hence, the metaphor of “*double sinawali*” contributes not merely as artistic expression but as a pedagogical framework aligning cultural practice with psychological theory.

### ***Summary and research gap***

The extant literature consistently demonstrates that individual interest is a robust predictor of study engagement across a range of physical education contexts. Anchored primarily in Self-Determination Theory (Deci & Ryan, 1985) and Expectancy-Value Theory (Eccles & Wigfield, 2002), prior studies show that enjoyment, perceived usefulness, and personal meaning jointly sustain students’ effort, persistence, and immersion in learning tasks. Empirical evidence from general physical education, dance, gymnastics, and other skill-based activities indicates that students who value an activity and perceive it as personally significant are more likely to remain engaged despite physical and cognitive challenges.

However, most of this empirical work has been conducted in contexts where physical education activities are recreational, fitness-oriented or enjoyment-driven. These settings implicitly assume that positive effects and intrinsic enjoyment function as primary motivational anchors for sustained engagement. Although this assumption aligns with SDT and EVT in many learning environments, it may not fully capture how motivation and engagement operate in culturally embedded, discipline-oriented and technically demanding practices such as indigenous martial arts.

As the national martial art and sport of the Philippines, Arnis represents a pedagogical context that foregrounds discipline, mastery, repetition and cultural responsibility alongside physical skill development. Participation in Arnis-based physical education is shaped not only by enjoyment but also by internalized values related to cultural identity, respect for tradition and the pursuit of technical competence. In such contexts, engagement may be driven less by immediate positive affect and more by value-laden and mastery-oriented processes, particularly those associated with attainment value and knowledge-seeking intentions. Examining Arnis therefore offers a theoretically meaningful opportunity to assess whether SDT and EVT predictions operate similarly when enjoyment is not the dominant motivational driver, but when perceived utility, personal significance and cultural meaning take precedence.

Viewing Arnis-based physical education through an intersectional lens provides a deeper understanding of how students’ engagement is shaped by multiple, interacting identity positions. Participation in indigenous martial arts is embedded within the convergence of cultural heritage (Jiang et al., 2025), institutional expectations (Cynarski, 2006), gender identity (Mandakathinal, 2021), and the broader academic positioning of Physical Education as a discipline (Martin & Santos, 2019). These intersecting dimensions influence how students interpret the value, meaning, and legitimacy of engagement in culturally grounded learning environments.

Positioning the present study within intersectionality extends the interpretation of individual interest beyond individual preference toward identity-informed engagement (Abreu,

2025; Eiden-Dillow & Best, 2022; Shishakly, 2025). Arnis represents not only a skill-based activity but also a culturally situated learning experience located at the intersection of identity formation, heritage preservation and formal higher education structures. This framing aligns the study with broader Asian scholarship examining how layered identities shape participation, inclusion, and educational engagement across diverse contexts.

Despite the growing body of research on individual interest and study engagement in physical education, no empirical study has examined this relationship within the context of Arnis or other indigenous martial arts. Moreover, while instruments such as the UWES-9S (Carmona-Halty et al., 2019) have been validated across academic and physical education settings, their application to culturally grounded and weapon-based learning environments remains unexplored. Addressing this gap allows the present study to extend SDT and EVT by testing their applicability under culturally embedded and skill-intensive conditions, thereby contributing to a more nuanced and context-sensitive understanding of motivation and engagement in physical education.

### ***Objectives and hypotheses formulation***

This study aims to examine the predictive relationship between individual interest and study engagement among college students enrolled in Arnis-based physical education classes. Guided by SDT and EVT, it specifically investigates how the three factors of individual interest predict the overall level of study engagement. It is hypothesized that each of these factors is significantly related to, and predictive of, students' study engagement in Arnis-based physical education.

## **Methods**

### ***Participants of the study***

This cross-sectional study involved college students from a state university in the Philippines enrolled in PATH-Fit 3 (Physical Activity Towards Health and Fitness 3) during the second semester of Academic Year 2024-2025. As part of the general Physical Education program, PATH-Fit 3 includes a range of physical activity domains determined by instructor expertise. For this investigation, participants were drawn from sections devoted to indigenous martial arts, with Arnis as the primary activity. Arnis was selected not only for its status as a credit-bearing component of the official PE curriculum but also for its cultural significance as the national martial art. Its structured syllabus and standardized instructional delivery provided a controlled learning environment, ideal for exploring the dynamics between individual interest and study engagement in a heritage-based, skill-intensive context.

Students were assigned to these sections based on institutional scheduling and availability, rather than personal preference. This arrangement minimized self-selection bias but also meant that baseline interest could not be assumed; instead, the study concentrated on how interest developed or persisted during the semester. Two licensed instructors with formal Arnis credentials taught the classes, ensuring consistency in pedagogy and assessment. The study's focus remained on student psychological constructs as articulated in the Tripartite Model of Individual Interest, excluding instructor-related variables such as emotional support, feedback quality or teaching style.

An a priori power analysis using G\*Power (version 3.1) indicated that a minimum sample size of 119 participants was necessary to detect a medium effect size ( $f^2 = .15$ ) with 95% power at an alpha level of .05 in a multiple regression model with three predictors (Faul et al., 2007). As can be seen in Table 1, the final sample consisted of 308 college students,

comprising 132 heterosexual men (42.9%), 140 heterosexual women (45.5%), and 36 individuals identifying as LGBTQIAP+ (11.7%). Participants' ages ranged from 17 to 22 years, with a  $\bar{x}$  age of 19.76 years.

**Table 1**

*Demographic profile of the participants (n = 308)*

Demographic characteristics	Item	n (%)
Sex/gender identity	Heterosexual men	132(42.9)
	Heterosexual women	140(45.5)
	LGBTQIAP+	36(11.7)
Age ( $\bar{x}$ = 19.76)	17	17(5.5)
	18	174(56.5)
	19	79(25.6)
	20	27(8.8)
	21	8(2.6)
	22	3(1.0)

### ***Instruments***

Data for this study was gathered through an online survey administered via Google Forms. Instructors handling PATH-Fit 3 (Physical Activity Towards Health and Fitness 3) courses specializing in Arnis were invited to disseminate the survey through the university's official Learning Management System (LMS). The data collection period spanned from April to May 2025, following the completion of all course-related practical and theoretical activities.

The survey consisted of three main sections. The first section collected demographic information, including sex/gender identity and age. The second section utilized the Students' Individual Interest in Physical Education Questionnaire by Roure et al. (2021), a 14-item instrument measuring individual interest across three factors: PAWR, SUV and SAVKSI. Responses were rated on a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). To match the study's context, certain terms (e.g., "physical education") were adapted to "Arnis class." This adaptation involved minimal contextual wording changes to ensure task relevance, rather than linguistic translation or cultural modification of item meaning. The third section featured the UWES-9S developed by Carmona-Halty et al. (2019), a 9-item measure assessing study engagement across vigor, dedication and absorption. Items were rated on a 7-point Likert scale from 0 (Never) to 6 (Always), with a composite score computed to represent overall study engagement.

### ***Instrument reliability, validity, and contextual application***

To ensure the psychometric robustness of the measurement tools employed in this study, a series of reliability and validity assessments were conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) via SmartPLS 4 (Hair et al., 2021). As shown in Table 2, all four latent constructs demonstrated strong internal consistency, convergent validity and acceptable levels of multicollinearity. Internal consistency reliability was supported by Cronbach's alpha (CA) and composite reliability (CR) values exceeding the recommended threshold of > 0.70 (Hair et al., 2021). CA values ranged from 0.884 (SUV) to 0.950 (SAVKSI), while CR values ranged from 0.920 (SUV) to 0.961 (SAVKSI), indicating excellent consistency of items within each construct. Convergent validity was confirmed by average variance extracted (AVE) values between 0.742 (SUV) and 0.833 (SAVKSI), all surpassing the minimum criterion of > 0.50 (dos Santos & Cirillo, 2021; Hair et al., 2021). Item loadings

across all constructs ranged from 0.823 (SUV2) to 0.923 (SAVKSI5), exceeding the recommended threshold of  $> 0.70$ , further affirming convergent validity (Hair et al., 2021). Moreover, variance inflation factor (VIF) values, used to assess multicollinearity among indicators, ranged from 1.968 (SUV2) to 4.394 (SAVKSI3), all below the conservative cut-off of  $< 5.00$  (Hair et al., 2021). These results indicate that collinearity did not threaten the structural integrity of the model and that each indicator contributed uniquely to its respective construct.

**Table 2**

*Reliability, convergent validity and collinearity diagnostics of the measurement model constructs*

Construct	Item	Item loadings	CA	CR		AVE	VIF
				$\rho_A$	$\rho_B$		
PAWR	PAWR1	0.879	0.916	0.917	0.937	0.748	3.043
	PAWR2	0.860					2.681
	PAWR3	0.894					3.269
	PAWR4	0.846					2.294
	PAWR5	0.845					2.353
SUV	SUV1	0.838	0.884	0.887	0.920	0.742	2.095
	SUV2	0.823					1.968
	SUV3	0.897					2.832
	SUV3	0.886					4.313
SAVKSI	SAVKSI1	0.889	0.950	0.951	0.961	0.833	3.280
	SAVKSI2	0.912					3.884
	SAVKSI3	0.922					4.394
	SAVKSI4	0.917					4.140
	SAVKSI5	0.923					4.313
UWES	UWES4	0.856	0.887	0.888	0.922	0.747	2.372
	UWES5	0.855					2.339
	UWES6	0.867					2.435
	UWES7	0.879					2.651

*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)  $< 5.0$ .

*Legend:* PAWR- Perceived affect and willingness to reengage, SUV- Stored-utility value SAVKSI- Stored attainment value and knowledge-seeking intentions, UWES- Stud. engagement.

Discriminant validity was assessed using the Fornell–Larcker criterion and the Heterotrait–Monotrait Ratio (HTMT) (Hair et al., 2021), as presented in Table 3. For the Fornell–Larcker criterion, the square root of the AVE for each construct (bolded diagonal) was greater than its correlations with other constructs, satisfying the requirement for discriminant validity (Fornell & Larcker, 1981). In addition, HTMT values ranged from 0.629 to 0.839, all below the conservative threshold of 0.85 (Henseler et al., 2015), reinforcing the constructs' empirical distinctiveness. Collectively, these findings confirm that all constructions are sufficiently unique and appropriate for subsequent structural model analysis (Hair et al., 2021).

**Table 3**

*Reliability, convergent validity and collinearity diagnostics of the measurement model constructs*

	PAWR	SAVKSI	SUV	UWES
<b>Fornell-Larcker Criterion</b>				
PAWR	0.865			
SAVKSI	0.700	0.913		
SUV	0.755	0.713	0.862	
UWES	0.569	0.636	0.617	0.864
<b>Heterotrait-Monotrait Ratio (HTMT)</b>				
PAWR				
SAVKSI	0.749			
SUV	0.839	0.780		
UWES	0.629	0.691	0.695	

Note: HTMT ratio value < 0.85 (conservative) < 0.90 (liberal) approach.

### **Data analysis**

To determine the predictive power of students' individual interest on their study engagement in Arnis-based physical education, multiple linear regression analysis was conducted. The three factors of individual interest were entered as independent variables, while study engagement was specified as the dependent variable. Analyses were performed using IBM SPSS Statistics (Version 29 of MacOS), with the level of statistical significance set at  $p < .05$ .

Table 4 presents the descriptive statistics, normality indices and bivariate correlations for the study variables. All skewness values ranged from -1.042 to -0.325, and all kurtosis values ranged from -0.327 to 1.031, which are well within the thresholds of -2 to +2 for skewness and -7 to +7 for kurtosis, indicating that the data did not deviate substantially from normality (Kim, 2013). Furthermore, significant positive correlations were found between all factors of individual interest and study engagement. PAWR was strongly correlated with SUV ( $r(306) = .75, p < .01$ ) and with SAVKSI ( $r(306) = .70, p < .01$ ). SUV was also strongly correlated with SAVKS ( $r(306) = .71, p < .01$ ). Study engagement (UWES) was positively correlated with PAWR ( $r(306) = .57, p < .01$ ), SUV ( $r(306) = .62, p < .01$ ) and SAVKSI ( $r(306) = .63, p < .01$ ). These results indicate that higher individual interest, across all three factors, is associated with higher levels of study engagement among students in Arnis-based physical education classes.

**Table 4**

Descriptive statistics, normality indices, and bivariate correlations among study variables

Construct	$\bar{x} \pm SD$	Skew	Kurt	1	2	3
PAWR	3.70 ± .85	-.325	-.325	-		
SUV	3.78 ± .85	-.416	-.327	.75**	-	
SAVKSI	4.16 ± .84	-1.042	1.031	.70**	.71**	-
UWES	3.90 ± .83	-.561	-.025	.57**	.62**	.63**

Note: Mean and Standard Deviation values are presented as  $\bar{x} \pm SD$ . Skewness values between -2 and +2 and kurtosis values between -7 and +7 indicate acceptable normality.

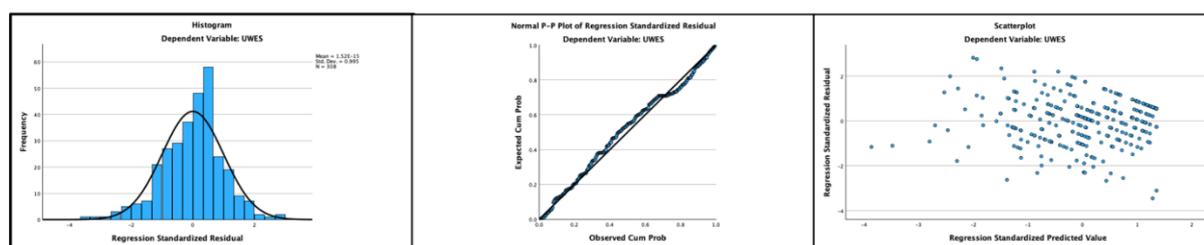
Legend: PAWR- Perceived affect and willingness to reengage, SUV- Stored-utility value SAVKSI- Stored attainment value and knowledge-seeking intentions, UWES- Stud engagement.

## Results

Preliminary analyses were conducted to examine whether the multiple regression model met the assumptions of normality, linearity, homoscedasticity, and independence of errors. Visual inspection of the histogram and normal P–P plot of standardized residuals indicated that the residuals were approximately normally distributed. The scatterplot of standardized residuals against standardized predicted values suggested a linear relationship and homoscedasticity, as the residuals were randomly dispersed without clear patterns. The Durbin-Watson statistics were 2.077, indicating that the assumption of independence of errors was satisfied. Overall, the diagnostic results confirmed that the data met the key assumptions for conducting multiple regression analysis.

### Figure 1

*Side-by-side regression diagnostic plots. From left to right: (a) histogram of standardized residuals, (b) normal probability (P–P) plot of standardized residuals, and (c) scatterplot of standardized residuals against standardized predicted values.*



*Note:* The plots collectively support the assumptions of normality, linearity, and homoscedasticity for the multiple regression model predicting study engagement.

The regression analysis showed that the overall model predicting study engagement from individual interest was statistically significant [ $F(3, 304) = 86.640, p < .001$ ], explaining 45.6% of the variance in study engagement (unadjusted  $R^2 = .461$ ). This indicates that almost half of the differences in students' engagement in Arnis-based physical education can be explained by their level of individual interest. Among the three factors of individual interest, SAVKSI was the strongest predictor of study engagement ( $\beta = .364, t = 5.678, p < .001$ ), followed by SUV ( $\beta = .281, t = 4.026, p < .001$ ). This suggests that students are most engaged when they see Arnis as personally significant, aligned with their goals and providing opportunities for skill mastery and deeper understanding. The practical usefulness of the activity also plays a substantial role, as recognizing its benefits for self-defense, physical fitness or cultural preservation contributes to sustained effort and involvement. In contrast, PAWR did not significantly predict study engagement ( $\beta = .101, t = 1.469, p = .143$ ). Statistically, the trivial effect size of PAWR ( $f^2 \approx .01$ ) suggests that affect-related indicators contributed minimal explanatory power beyond the value-based dimensions when all predictors were entered simultaneously in the model. This indicates that simply enjoying the activity or having the willingness to participate again may not be enough to drive higher engagement in Arnis classes. Using Cohen's  $f^2$ , SAVKSI showed a small-to-moderate unique effect ( $f^2 \approx .11$ ), SUV a small effect ( $f^2 \approx .05$ ), reinforcing that perceived value and mastery were stronger engagement predictors than enjoyment alone.

**Table 5**

*Hypotheses testing concerning the relationship between individual interest and study engagement in Arnis*

Hypothesis	Paths	$\beta$	$R^2$	$F$	$t$ -value	$p$ -value	Decision
H <sub>1</sub>	INDINT → UWES	-	.456	86.640	-	<.001	Accepted
H <sub>1a</sub>	PAWR → UWES	.101	-	-	1.469	.143	Rejected
H <sub>1b</sub>	SUV → UWES	.281	-	-	4.026	<.001	Accepted
H <sub>1c</sub>	SAVKSI → UWES	.364	-	-	5.678	<.001	Accepted

*Note:* Significance is at  $p < .05$ . The unadjusted  $R^2$  was .461 (46.1%), suggesting a slightly higher estimate of variance explained.

Legend: INDINT- Individual interest, PAWR- Positive affect and willingness to reengage, SUV- Stored-utility value, SAVKSI- Stored attainment value and knowledge seeking intentions, UWES- Study engagement

## Discussion

The present study demonstrated that individual interest significantly predicts study engagement in Arnis-based physical education, accounting for nearly half of the variance in engagement levels. This robust finding affirms the central tenets of SDT, which posits that motivation flourishes when learning about environments supporting autonomy, competence and relatedness. In the context of Arnis, these psychological needs can be met through opportunities for self-directed practice, mastery of increasingly complex techniques and collaboration with peers during drills and sparring. The combination of skill development and interpersonal interaction transforms the PE class from a mere requirement into an intrinsically meaningful endeavor. This underscores that in skill-based and culturally embedded activities, engagement is not incidental, but it emerges from an alignment between the learner's motivational orientation and the structural affordances of the activity.

Closer inspection of the factors revealed that SUV and SAVKSI significantly predicted UWES, resonating with EVT (Eccles & Wigfield, 2002). EVT emphasizes that students' sustained participation hinges on their belief that an activity serves valuable personal or future-oriented purposes (Q. Wang & Xue, 2022), alongside the recognition of its importance in their identity or life goals (Ceyhan & Tillotson, 2020). In the case of Arnis, students who perceive its relevance to self-defense, fitness, discipline or professional aspirations are more inclined to invest effort and persist in practice. This finding has been supported by scholarly works in the general PE context (Bautista et al., 2023; Martin, et al., 2023). Likewise, students with strong SAVKSI set mastery-oriented goals, actively seek feedback and approach the discipline as an evolving skill set rather than a static requirement, which was supported by similar studies in contextualized PE such as Philippine traditional dances (Lobo, 2023) and hip-hop dance (Lobo, 2025a). In this case, these behaviors translate into higher engagement because the activity is framed as a long-term pursuit with tangible personal rewards.

The absence of a significant relationship between PAWR and UWES is a noteworthy and somewhat counterintuitive finding. Similar results emerged in a gymnastics-based physical education study (Lobo, 2025c), where enjoyment alone was insufficient to sustain deep engagement. One plausible explanation lies in the physical and cognitive demands inherent to both Arnis and gymnastics. These activities require technical precision, repetitive skill drills and mental discipline (Miltiadis et al., 2012; Moeskops et al., 2019; Mortejo & Okilanda, 2024; Santos et al., 2023), which may temper the immediate enjoyment that fuels PAWR. In other words, positive effects may be present in initial participation, but without strong perceptions of utility and personal relevance, enjoyment may wane over time. This aligns with research

suggesting that in complex skill domains, enjoyment functions best as a supplementary motivator rather than the primary driver of engagement (Roure & Pasco, 2018).

In the context of Arnis, the non-significance of PAWR reflects how Filipino students perceive participation through a lens of discipline, respect and cultural responsibility rather than transient pleasure. As an indigenous martial art, Arnis embodies collective identity, humility and perseverance (Nandar, 2025; Peralta, 2025). These are values that redefine enjoyment as fulfillment through mastery and cultural continuity. This perspective aligns with Self-Determination Theory's process of identified regulation (Ryan & Deci, 2000), where engagement is internalized because the activity is valued as meaningful and self-defining (Guay, 2022). In martial arts pedagogy, enjoyment is not detached from effort but emerges from disciplined repetition and social connection (Channon & Jennings, 2014; Cynarski, 2013). Therefore, the non-significance of PAWR suggests that for Filipino learners, the joy of Arnis is rooted less in excitement and more in purpose which are anchored in competence, cultural pride and shared identity. These interpretations are offered as theoretically grounded explanations aligned with SDT and EVT, rather than as empirically tested mechanisms within the present model, which examined the relationships between individual interest dimensions and study engagement.

The cultural dimension of Arnis adds another layer to the significance of SAVKSI. Arnis is not only a sport but also a bearer of Filipino heritage, recognized as the national martial art and sport of the Philippines (*History of Filipino Martial Arts – Philippine Eskrima Kali Arnis Federation*, n.d.). According to Lobo (2023), students who internalize this cultural connection may perceive their participation as contributing to the preservation and promotion of national identity. This perception transforms their engagement into a form of cultural stewardship, where the activity's meaning extends beyond personal achievement toward collective pride and historical continuity (Lobo, 2023, 2024). Culturally relevant pedagogy (Ladson-Billings, 1995) emphasizes precisely this dynamic, noting that when students see their cultural values reflected in learning activities, they exhibit stronger motivation, persistence and academic resilience (Hutchison & McAlister-Shields, 2020; Pevec-Zimmer et al., 2024; Wrench & Garrett, 2021). Viewed through an intersectional lens, this culturally grounded engagement reflects not only motivational processes, but also identity-informed meaning-making shaped by cultural heritage, institutional expectations and the academic positioning of indigenous physical education.

From a pedagogical standpoint, these findings underscore the need for PE instructors to go beyond creating a “fun” environment, as supported by Lobo (2025d). While fostering enjoyment remains important, greater emphasis should be placed on linking the activity to students' broader life goals and cultural narratives. Instructors might incorporate structured goal-setting exercises (Dekker et al., 2024), reflective discussions on its socio-historical significance (Pacadaljen, 2024) and tiered skill progression pathways that allow students to envision their growth over time (H. C. Chen et al., 2017) through teaching Arnis. This approach aligns with both SDT's competence-supportive strategies (Slemp et al., 2021) and EVT's focus on perceived value (Shang et al., 2023), effectively embedding engagement in deeper motivational structures.

Furthermore, the findings invite broader reflection on curriculum design in physical education. Activities like Arnis, which combine physical skill development with cultural and personal relevance (Peralta, 2025; Rio & Saligan, 2023), may serve as powerful vehicles for fostering sustained engagement across diverse student populations. Curriculum planners could consider integrating such culturally grounded (Lobo, 2026), skill-intensive activities alongside other PE offerings to provide a balanced program that caters to varied motivational profiles (Guinto & Campoamor-Olegario, 2025). In contexts where student disengagement in PE is a concern (Tagare Jr. et al., 2025; R. J. L. Tagare, 2025; R. L. Tagare et al., 2025), leveraging

culturally embedded sports might not only boost participation but also instill a sense of pride and belonging that transcends the classroom.

To end, this study adds to the growing body of literature affirming the predictive value of individual interest, particularly its cognitive and value-laden factors, on engagement in skill-intensive, culturally significant PE contexts. By demonstrating that SUV and SAVKSI, but not PAWR, drive engagement in Arnis-based PE, the findings caution against over-reliance on enjoyment alone as a motivational anchor. They also highlight the pedagogical potential of aligning PE activities with students' broader goals and cultural identities. Future research could extend these findings by exploring how instructional interventions designed to enhance perceived utility and attainment value might further amplify engagement, not only in Arnis but also in other traditional and modern physical education settings.

## **Conclusion**

This study sets out to examine the predictive role of the three factors of individual interest on study engagement in Arnis-based physical education. The findings revealed that SUV and SAVKSI significantly contributed to higher engagement, underscoring the importance of perceived value, long-term relevance and mastery-oriented goals in sustaining active participation. Conversely, PAWR did not emerge as a significant predictor, suggesting that while enjoyment is beneficial, it may not independently drive deep and sustained engagement in skill-intensive activities such as Arnis.

By highlighting the greater predictive strength of cognitive and value-laden interest factors over affective enjoyment, the study contributes to the growing evidence that effective engagement in PE is anchored less in transient positive emotions and more in the integration of personal meaning, future-oriented goals and cultural relevance. The results reaffirm the applicability of SDT and EVT in PE contexts, demonstrating that engagement thrives when activities satisfy psychological needs and align with students' perceived utility and personal aspirations.

Overall, the study affirms that Arnis, as both a sport and a cultural heritage, offers a unique platform for fostering meaningful and sustained engagement when taught with pedagogical strategies that emphasize relevance, progression and identity connection. These insights invite PE practitioners and curriculum planners to design learning experiences that go beyond fostering enjoyment, instead of embedding activities within broader motivational, cultural and intersectional frameworks that can inspire commitment, pride and resilience in students.

## **Implications of the study**

### ***Theoretical implications***

This study reinforces the applicability of SDT and EVT in understanding student engagement in martial arts-based physical education within higher education. The significant predictive power of SAVKSI and SUV suggests that engagement in complex, skill-based activities is sustained when learners perceive clear personal utility, attainable mastery and future relevance. These findings contribute to the theoretical discourse by emphasizing that in higher education contexts, enjoyment alone (PAWR) may not be enough to maintain engagement, particularly in physically and technically demanding PE activities.

Within the indigenous martial art of Arnis, the psychological needs described in SDT manifest through culturally embedded forms of participation and collective pride. Students experience engagement not only as personal fulfillment but also as an act of cultural continuity

and national identity. Likewise, EVT's value components of attainment and utility mirror the intrinsic worth of mastering a heritage practice that preserves Filipino tradition while advancing skill and self-development. In this sense, motivation and engagement in Arnis are best understood as intertwined psychological and cultural processes.

### ***Pedagogical implications***

The results indicate the importance of instructional strategies that move beyond cultivating positive effect to explicitly link the activity to students' long-term goals, skill progression and self-development. PE instructors can integrate goal-setting exercises, reflective discussions and structured skill advancement pathways to strengthen the connection between course participation and broader academic, professional and personal objectives. These approaches can be adapted across other high-skill domains such as gymnastics, aquatics and other combative sports.

### ***Cultural implications***

The prominence of SAVKSI reflects the cultural resonance of Arnis as a Filipino martial art, underscoring its value as both a skill discipline and a means of cultural preservation. Embedding culturally rooted activities within PE programs can enhance motivation by fostering a sense of identity, pride and belonging among students. In higher education, this approach aligns with culturally responsive pedagogy, where local traditions are not treated as supplementary but as integral components of the curriculum.

### ***Policy and curriculum implications***

At an institutional level, the findings advocate for the sustained inclusion of indigenous sports like Arnis in higher education PE curricula. Policymakers and curriculum developers should acknowledge the dual role of these activities in promoting physical literacy and safeguarding cultural heritage. This may involve formalizing indigenous sports in course offerings, providing faculty development for specialized instruction and allocating resources for proper implementation. These measures can position physical education as a cornerstone for holistic development, cultural enrichment and national identity building.

### ***Limitations of the study***

The study's findings should be interpreted with caution due to several limitations. Its cross-sectional design restricts the ability to establish causal relationships between individual interest and study engagement, while reliance on self-reported data may have introduced social desirability, recall bias and common method bias. To mitigate these risks, several procedural remedies were implemented, including voluntary participation, anonymous responses and the absence of evaluative or performance-related consequences, which help reduce evaluation apprehension. In addition, the study employed theoretically distinct constructs measured using validated instruments with different scale formats, which further minimizes method-related inflation.

Moreover, the sample, drawn from a single higher education institution, limits the generalizability of results to other universities with different curricular structures, cultural contexts or instructional approaches. The focus on Arnis as a culturally rooted physical education activity may also yield insights that are not directly transferable to non-indigenous sports settings. Finally, other potentially influential factors, such as teaching style, peer

interactions, prior martial arts experience and access to training resources, were not examined, suggesting avenues for more comprehensive future investigations. Future studies may employ longitudinal designs, multi-source data, or experimental approaches to further address these limitations.

### ***Future research directions***

Building on these findings, future research could adopt longitudinal designs to track changes in individual interest and engagement over the course of a semester or academic year, offering a clearer view of motivational trajectories in martial arts-based PE. Expanding the scope to include multiple higher education institutions, both within and outside the Philippines, would enhance generalizability and allow for cross-cultural comparisons between indigenous and non-indigenous sports. Incorporating qualitative or mixed-method approaches could uncover the nuanced, lived experiences of students, particularly how cultural identity and perceived utility shape sustained participation. Additionally, examining moderate variables such as teaching styles, peer climate and prior exposure to martial arts could provide a more comprehensive understanding of the engagement process. Finally, integrating experimental or quasi-experimental designs could test targeted interventions aimed at enhancing stored utility value and attainment value, thereby moving beyond correlation toward evidence-based strategies for sustaining engagement.

### ***Contribution of Philippine studies to global discourse***

This study contributes to the global discourse on physical education by foregrounding an indigenous martial art as both a pedagogical tool and a cultural asset in higher education. While much of the international literature on PE engagement focuses on mainstream or globally popular sports, this research demonstrates that culturally rooted activities can serve as equally powerful, if not more meaningful, contexts for sustaining student motivation. By integrating SDT and EVT into the analysis of an indigenous sport, the study extends the applicability of these motivational frameworks beyond Western-centric and sport-specific paradigms. Furthermore, it highlights the unique ways in which cultural identity, heritage preservation and national pride intersect with academic engagement, dimensions that are often underrepresented in global PE scholarship. In doing so, it positions the Philippine higher education context as a valuable site for generating insights that are transferable to other multicultural and postcolonial settings, encouraging a more inclusive and diversified understanding of engagement in sport and physical education worldwide.

### **Consent to Participate**

Respondents were required to provide their consent by ticking the agreement attached in the Google forms.

### **Institutional Review Board Statement**

This study comprised with established ethical standards for research involving human participants. Prior to data collection, it underwent internal ethical review and was granted expedited approval, as it presented minimal risk and involved voluntary, anonymous participation. Participants were informed of the study's objectives, their right to withdraw at any stage and the assurance of confidentiality. Digital informed consent was secured through

the survey platform. No personally identifiable information was gathered, and all data was used solely for academic and research purposes.

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The author declares no conflict of interest.

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### **Data Availability**

The availability of data can be obtained by requesting directly to the corresponding author.

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### Notes on Contributor

**Dr. Joseph Lobo** is an Assistant Professor IV and Research Coordinator at the College of Sports, Exercise and Recreation, Bulacan State University. His research focuses on individual interest, motivation and student engagement in movement-based education, with numerous publications in Scopus-indexed journals. He also serves as Head of the University Journal Publications Office and is an active member of national research networks in Physical Education and Sports Science. His scholarly work advances culturally responsive pedagogy and learner-centered approaches in higher education.

### ORCID

**Dr. Joseph Lobo**, <https://orcid.org/0000-0002-2553-467X>