Research Article

Student Continued Engagement in Taekwondo Activity in Selected Colleges and Universities: A Self-Determination Theory-Based Process Model

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ABSTRACT

Self-Determination Theory (SDT) provides a comprehensive framework for understanding student motivation and engagement through three psychological needs: autonomy, competence, and relatedness. While extensive research has examined SDT in traditional academic contexts, limited investigation has explored its application to martial arts education, particularly Taekwondo. This study examined the relationship between SDT constructs and student engagement in Taekwondo activities among college students. A cross-sectional survey design was employed with 125 Taekwondo practitioners (107 females, 18 males) from selected colleges and universities. Participants completed a multi-item Likert scale measuring four SDT constructs: autonomy, competence, relatedness, and motivation, with five items per construct. Data analysis included descriptive statistics, independent samples t-tests, one-way ANOVA, and multiple linear regression. Results revealed that relatedness scored highest among participants (M = 4.18), followed by competence (M = 3.73), motivation (M = 3.22), and autonomy (M = 2.98). No statistically significant differences were found between genders or across sleep hour categories. Interestingly, parental involvement significantly affected motivation, with students reporting low parental involvement demonstrating higher motivation levels than those with medium involvement. Multiple regression analysis revealed that all three SDT needs significantly predicted motivation, with competence emerging as the strongest predictor ($\beta = 0.394$), followed by relatedness ($\beta = 0.313$) and autonomy ($\beta = 0.234$). The model explained 50.7% of the variance in student motivation ($R^2 = 0.507$). These findings suggest that Taekwondo training environments that foster feelings of competence, social connection, and appropriate autonomy support can enhance student engagement and sustained participation in Taekwondo activities.

Background

Self-Determination Theory (SDT) is a motivational framework that explains student engagement through the satisfaction of three fundamental psychological needs: relatedness, competence, and autonomy (Wood, 2019). This theoretical framework has gained substantial recognition in educational research for its ability to predict and enhance student motivation and engagement across diverse learning contexts. While SDT emphasizes autonomy as a central component, emerging research suggests that the quality of teacher-student relationships (relatedness) and perceived competence may be more influential in fostering student engagement, particularly in specialized learning environments (Wood, 2019). These findings propose a hierarchical order of influence among the SDT constructs, challenging traditional assumptions about the primacy of autonomy in motivation.

In contemporary educational contexts, particularly during challenging periods such as the COVID-19 pandemic, digital support strategies that better satisfy students' psychological needs have demonstrated their importance in maintaining engagement levels (Chiu, 2021). Notably, relatedness support was found to be particularly crucial in online learning environments, suggesting that social connection remains fundamental to sustained educational engagement regardless of delivery modality (Chiu, 2021). This emphasis on social connection extends beyond traditional classroom settings and has important implications for understanding engagement in physical activity and sports contexts.

Student engagement represents a critical factor in educational success, particularly in higher education settings. Research consistently demonstrates that engagement is positively linked to desired outcomes of undergraduate education and academic performance (Sharma, 2021). Engaged students demonstrate higher levels of investment in learning, maintain better attendance records, participate more actively in educational activities, and show significantly lower dropout rates compared to their less engaged counterparts (Sharma, 2021). These outcomes highlight the practical importance of understanding and fostering engagement across all educational domains.

Within the domain of sports education, student engagement has been shown to produce positive effects on both academic and personal development. Participation in school sports teams is associated with increased school engagement among middle school students, with research indicating that longer participation periods lead to progressively higher engagement levels (Yanik, 2018). For college athletes, engagement levels are generally comparable to non-athletes, though participants in revenue-generating sports may demonstrate lower engagement than their non-revenue counterparts. Importantly, motivation plays a crucial role in sports engagement, with significant relationships found between sports motivation and engagement among physical education students (Potenciando et al., 2024).

Taekwondo, as a Korean martial art and competitive sport, combines sophisticated hand and foot techniques while requiring high levels of nerve-muscle coordination (Yılmaz, 2021). The practice emphasizes crucial physical attributes including explosive leg strength, aerobic resilience, balance, and flexibility (Yılmaz, 2021). Taekwondo training programs are specifically designed to prepare athletes for both the physical activities and physiological demands of competition, creating a unique educational environment that combines physical, mental, and philosophical elements (Yılmaz, 2021). As an Eastern martial art that emphasizes discipline, respect, and self-improvement, Taekwondo resonates deeply with cultural values in many societies, providing a rich context for examining student engagement and motivation.

Despite the growing body of research on SDT applications in educational contexts, there remains a lack of consistency in evidence regarding the constructs of self-determination

theory within martial arts education, specifically Taekwondo. Understanding engagement within diverse cultural contexts provides culturally relevant insights that can inform instructional practices and program development. Examining how students interact with Taekwondo training reveals variations in theoretical applications across diverse cultural backgrounds and educational settings. By studying student engagement in this specialized sport, instructors and institutions can better leverage cultural values and motivational principles, potentially enhancing participation rates and improving the overall quality of students' educational experiences in Taekwondo programs.

Statement of the Problem

This study addresses the following research questions:

1. What is the profile of the respondents in terms of gender, parental involvement, and sleep hours?
2. How do respondents assess their individual experiences in terms of autonomy, competence, relatedness, and motivation?
3. Are there variations in the respondents' experiences when grouped according to gender, parental involvement, and sleep hours?
4. Which among the four Self-Determination Theory variables are predictors of student engagement in Taekwondo?

Hypotheses

H_1: Autonomy positively influences student engagement in Taekwondo activities.

H_2: Competence positively affects student engagement in Taekwondo activities.

H_3: A sense of relatedness positively impacts student engagement in Taekwondo activities.

H_4: Higher motivation levels positively contribute to student engagement in Taekwondo activities
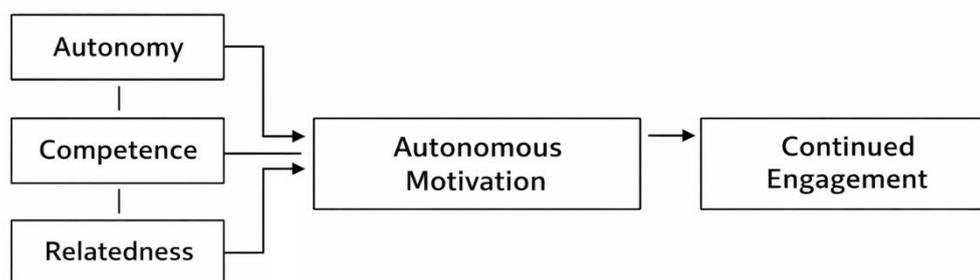
Theoretical Framework and Model

Figure 1. Theoretical Framework Model

The study is grounded in Self-Determination Theory (SDT), which posits that the satisfaction of three basic psychological needs—autonomy, competence, and relatedness—promotes high-quality, autonomous motivation, which in turn leads to enhanced engagement and persistence in activities (Ryan & Deci, 2000). In this model, motivation serves as the key mediator, translating psychological need satisfaction into observable engagement behaviors. This study applies this process model to the context of collegiate Taekwondo. It examines how perceived autonomy, competence, and relatedness within the training environ-

ment predict intrinsic and autonomous motivation, which is subsequently expected to correlate with students' continued engagement in the activity. The derived statistical relationships are synthesized into a visual Taekwondo Engagement Process Model (see Figure 1 in the Discussion section), illustrating the proposed pathway from need satisfaction through motivation to sustained engagement.

Methodology

The study employed a quantitative, descriptive, and cross-sectional research design using existing survey data to describe the char-

acteristics of Taekwondo practitioners and examine relationships among variables at a single point in time. A total of 125 Taekwondo practitioners from selected colleges and universities participated in the study, consisting of 107 females (85.6%) and 18 males (14.4%), indicating a predominantly female sample. Participants were drawn from various contexts: some were varsity athletes training for competition, while others were enrolled in elective Physical Education (PE) classes or recreational Taekwondo clubs. This mix represents the typical Taekwondo activity landscape in the sampled universities.

Data were collected using a structured survey instrument grounded in Self-Determination Theory, which operationalized key constructs through a multi-item Likert scale. The instrument measured four psychological constructs: autonomy, competence, relatedness, and motivation, with each construct assessed using five items focusing on relevant aspects such as choice and control in training, confidence and skill improvement, social connection with peers and coaches, and intrinsic enjoyment of training. Mean scores for each construct were computed by summing the responses to the five items and dividing by five, resulting in four continuous variables representing each participant's level of autonomy, competence, relatedness, and motivation. Data analysis involved several statistical techniques, including descriptive statistics to summarize demographic characteristics and SDT constructs, independent samples t-tests to examine gender differences, one-way analysis of variance (ANOVA) to assess differences across parental involvement and sleep hour categories, and multiple linear regression analysis to identify significant predictors of motivation among the three psychological needs.

Results

Table 1. Profile of the Respondents (N = 125)

Category	Classification	Frequency	Percentage (%)
Gender	Female	107	85.6%
	Male	18	14.4%
Parental Involvement	Medium	85	68.0%
	Low	25	20.0%
	High	15	12.0%
Sleep Hours	7-8 hours	66	52.8%
	5-6 hours	45	36.0%
	9-10 hours	13	10.4%
	4 hours or less	4	3.2%

Table 1 presents the demographic characteristics of the study participants. The sample was predominantly female (85.6%), with the majority reporting medium levels of parental involvement (68.0%) and optimal sleep duration of 7-8 hours per night (52.8%).

Table 2. Self-Determination Theory Assessment

SDT Variable	Overall Mean Score	Interpretation
Autonomy	2.98	Moderate
Competence	3.73	Moderately High
Relatedness	4.18	High
Motivation	3.22	Moderate

Table 2 shows that participants reported the highest levels of relatedness (M = 4.18), indicating strong social connections within their Taekwondo training environment. Competence was rated as moderately high (M = 3.73), while both motivation and autonomy received moderate ratings (M = 3.22 and M = 2.98, respectively).

Group Comparisons
Table 3. Variations in SDT Variables by Gender (Mean Scores)

SDT Variable	Female (n = 107)	Male (n = 18)
Autonomy	2.96	3.16
Competence	3.72	3.78
Relatedness	4.19	4.11
Motivation	3.22	3.21

Table 3 reveals minimal differences between male and female participants across all SDT variables, with males showing slightly higher autonomy and competence scores, while females reported marginally higher relatedness and motivation.

Table 4. Variations in SDT Variables by Parental Involvement (Mean Scores)

SDT Variable	Low (n = 25)	Medium (n = 85)	High (n = 15)
Autonomy	3.06	2.94	3.09
Competence	3.78	3.70	3.87
Relatedness	4.23	4.16	4.21
Motivation	3.42	3.16	3.32

Table 4 shows that participants with low parental involvement reported the highest motivation scores, while those with medium involvement showed the lowest motivation levels across all three parental involvement categories.

Inferential Statistical Analysis
Table 5. Independent Samples t-test Results - Gender Differences

SDT Variable	Female Mean	Male Mean	t-value	p-value	Significant?
Autonomy	2.96	3.16	-1.12	0.265	No
Competence	3.72	3.78	-0.42	0.673	No
Relatedness	4.19	4.11	0.72	0.471	No
Motivation	3.22	3.21	0.04	0.970	No

Table 5 demonstrates that no statistically significant differences were found between males and females on any of the Self-Determination Theory variables (all $p > 0.05$).

Table 6. One-Way ANOVA Results - Parental Involvement Differences

SDT Variable	F-value	p-value	Significant?	Post-Hoc Results (Tukey HSD)
Autonomy	1.45	0.239	No	No significant pairwise differences
Competence	1.82	0.167	No	No significant pairwise differences
Relatedness	0.68	0.509	No	No significant pairwise differences
Motivation	4.32	0.016*	Yes	Low > Medium (p = 0.012)

Table 6 reveals that only motivation showed statistically significant differences based on parental involvement. Post-hoc analysis revealed that students with low parental involvement reported significantly higher motivation than those with medium involvement (p = 0.012).

Table 7. One-Way ANOVA Results - Sleep Hours Differences

SDT Variable	F-value	p-value	Significant?	Post-Hoc Results (Tukey HSD)
Autonomy	0.18	0.910	No	No significant pairwise differences
Competence	0.31	0.817	No	No significant pairwise differences
Relatedness	0.65	0.585	No	No significant pairwise differences
Motivation	1.24	0.297	No	No significant pairwise differences

Table 7 shows that no statistically significant differences were found across sleep hour categories for any SDT variables, suggesting that sleep duration does not significantly influence students' psychological need satisfaction in Taekwondo training.

Table 8. Multiple Linear Regression Results - Predictors of Motivation

Predictor Variable	Unstandardized Coefficient (B)	Standard Error	Standardized Coefficient (β)	t-value	p-value	Significant?
(Constant)	0.421	0.283	—	1.49	0.139	—
Autonomy	0.185	0.065	0.234	2.85	0.005*	Yes
Competence	0.384	0.084	0.394	4.57	<0.001*	Yes
Relatedness	0.298	0.078	0.313	3.82	<0.001*	Yes

Model Summary: R = 0.712, R^2 = 0.507, Adjusted R^2 = 0.495, F(3,121) = 41.42, p < 0.001

Table 8 demonstrates that the regression model explains 50.7% of the variance in motivation. All three SDT variables are significant predictors of motivation, with competence being the strongest predictor (β = 0.394), followed by relatedness (β = 0.313), and autonomy (β = 0.234). The overall model was highly significant (p < 0.001).

Results

The results of this study provide valuable insights into the application of Self-Determination Theory within the context of Taekwondo training and reveal several noteworthy patterns that contribute to our understanding of student engagement in martial arts education.

High Relatedness Scores in Martial Arts Context

The finding that relatedness achieved the highest mean score (M = 4.18) among all SDT constructs is particularly significant within the context of martial arts training. This result aligns with the community-oriented nature of traditional martial arts, where relationships between students, instructors, and the broader martial arts community form a fundamental component of the learning experience. Taekwondo training emphasizes respect, mutual support, and collective growth, creating an environment where social connections naturally flourish. This finding supports previous research by Chiu (2021), who identified relatedness as particularly important in specialized learning environments, and extends this understanding to physical education and martial arts contexts.

The predominance of female participants in this study raises a question about the potential influence of gender on this high relatedness score. Some literature suggests that females may place a higher value on social connection and relational aspects in sports and learning environments. While the statistical analysis found no significant gender differences in our sample, the demographic skew implies a need for caution in generalizing this finding to populations with balanced gender representation. The strong sense of community reported here may reflect both the inherent nature of Taekwondo culture and the specific composition of the sample.

Moderate Competence and Autonomy Findings

The moderate levels reported for competence (M = 3.73) and autonomy (M = 2.98) suggest areas for potential improvement in Taekwondo training programs. The moder-

ately high competence scores indicate that students generally feel capable and confident in their abilities, which is encouraging for sustained engagement. However, the moderate autonomy scores suggest that students may benefit from greater involvement in decision-making processes related to their training, goal-setting, and skill development approaches. This finding is consistent with Wood's (2019) observations about the hierarchical nature of SDT constructs, where autonomy may be less immediately apparent but remains important for long-term engagement.

The Taekwondo Engagement Process Model

In alignment with SDT, the results support a process model where the satisfaction of the three basic psychological needs predicts autonomous motivation, which is the proximal driver of continued engagement. The regression analysis confirmed that all three needs competence, relatedness, and autonomy significantly predict motivation, with competence being the strongest predictor. This positions motivation as the central mediator in the pathway to engagement, as theorized by SDT. Based on these findings, the following process model is proposed:
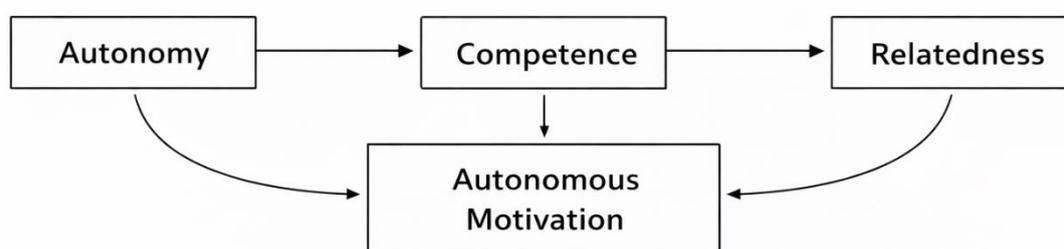

Figure 2. The Taekwondo Engagement Process Model

The proposed model illustrates that the satisfaction of Autonomy, Competence, and Relatedness needs within the Taekwondo environment fuels students' autonomous motivation. This enhanced motivation, in turn, is the key mechanism leading to their sustained participation and engagement in Taekwondo activities.

Inclusivity of the Taekwondo Experience

The absence of statistically significant differences in SDT variables based on gender, combined with the lack of significant impact from other demographic factors such as sleep hours, is a positive finding for Taekwondo programs. It suggests that the motivational benefits of Taekwondo training, as framed by SDT, are consistently accessible to students regardless of background. This indicates that the Taekwondo curriculum and culture in the sampled universities provide an inclusive environment that fosters psychological need satisfaction equitably.

Parental Involvement Paradox

One of the most intriguing findings is the significant relationship between parental involvement and motivation, where students with low parental involvement reported higher motivation levels than those with medium involvement. This counterintuitive result may reflect the nature of intrinsic motivation in young adult populations, where excessive parental involvement might be perceived as controlling rather than supportive, potentially undermining autonomous motivation. This finding suggests that in college-age populations, some degree of independence from parental oversight may actually enhance intrinsic motivation for physical activities like Taekwondo. Future research should explore the optimal balance of family support that enhances rather than diminishes autonomous motivation in martial arts contexts.

Sleep Hours and Psychological Need Satisfaction

The lack of significant relationships between sleep hours and any SDT variables was unexpected, given the established connections between sleep quality and various aspects of physical and psychological well-being. This finding may suggest that the psychological benefits and social connections derived from

Taekwondo training are robust enough to transcend variations in sleep patterns, or alternatively, that the sleep hour categories used in this study were not sensitive enough to detect meaningful relationships. Future research might benefit from examining sleep quality rather than just quantity, or exploring more detailed sleep pattern assessments.

Regression Model Implications

The multiple regression results provide strong support for SDT as a theoretical framework for understanding engagement in Taekwondo. The finding that competence emerged as the strongest predictor of motivation ($\beta = 0.394$) has important practical implications for instructors and program designers. This result suggests that training programs that emphasize skill development, provide appropriate challenges, and offer clear feedback on progress are most likely to maintain high levels of student motivation and engagement.

The significance of all three SDT constructs as predictors of motivation, with the model explaining over 50% of the variance, demonstrates the comprehensive nature of psychological need satisfaction in martial arts contexts. This finding supports the theoretical proposition that optimal motivation results from the simultaneous satisfaction of autonomy, competence, and relatedness needs, rather than focusing on any single construct in isolation.

Theoretical and Practical Implications

These findings have several important theoretical and practical implications. From a theoretical perspective, the study extends SDT research into martial arts education and provides evidence for the theory's applicability across diverse physical education contexts. The hierarchical importance of competence over relatedness and autonomy in predicting motivation may reflect the specific demands and culture of martial arts training, where skill mastery and personal achievement are highly valued.

Practically, these results suggest that Taekwondo instructors and program administrators should prioritize creating training environments that foster competence development through appropriate challenge levels, constructive feedback, and clear progression pathways. While maintaining the strong sense of community that characterizes successful martial arts programs, instructors should also seek ways to enhance student autonomy through choice in training methods, goal-setting opportunities, and collaborative decision-making processes.

Conclusion

This study successfully examined the relationship between Self-Determination Theory constructs and student engagement in Taekwondo activities among college students. The findings demonstrate that SDT provides a valuable framework for understanding motivation in martial arts contexts, with all three psychological needs contributing significantly to student motivation and engagement.

Key findings indicate that relatedness represents the strongest aspect of students' Taekwondo experience, reflecting the community-oriented nature of martial arts training. Competence emerged as the most important predictor of motivation, suggesting that skill development and achievement remain central to sustained engagement. The absence of gender differences and the unexpected relationship between parental involvement and motivation provide important insights for program development and family engagement strategies.

Limitations

Several limitations should be acknowledged when interpreting these results. The cross-sectional design prevents causal inferences about the relationships between SDT constructs and engagement. The sample composition, being predominantly female (85.6%), may limit generalizability to more balanced gender populations in Taekwondo programs. This gender disparity may also influence the results, particularly the high relatedness scores, as research suggests potential gendered differences in valuing social connection in sports. Additionally, the study was conducted within a specific geographic and cultural context, which may influence the applicability of findings to other regions or cultural settings where martial arts training may be structured differently.

Recommendations for Future Research and Practice

Future research should employ longitudinal designs to examine how SDT constructs develop and change over time as students' progress in their Taekwondo training. Investigation of optimal parental involvement levels and their interaction with student developmental stages would provide valuable guidance for family engagement strategies. Additionally, comparative studies across different martial arts styles and cultural contexts would enhance understanding of the generalizability of these findings.

For practitioners, these findings suggest that Taekwondo programs should emphasize competence development while maintaining strong community connections. Specifically, Physical Education departments and Taekwondo instructors can leverage the high value placed on relatedness by integrating pedagogical strategies that deepen social bonds. Implementing structured peer-teaching sessions, where senior students guide beginners, can enhance both competence (for the teacher) and relatedness. Similarly, incorporating team-based performances or cooperative sparring drills can strengthen group cohesion and collective identity, directly tapping into the need for relatedness to boost long-term retention.

Training programs should incorporate structured feedback systems, clear progression markers, and opportunities for student input in goal-setting and training approaches. Professional development for instructors should focus on strategies for fostering all three psychological needs while recognizing the particular importance of competence development in maintaining student motivation and long-term engagement in Taekwondo training.

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