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Exploring the relationship between self-directed learning readiness and academic learning outcomes among Vietnamese undergraduates

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ABSTRACT

As the demand for lifelong learning and adaptability grows, self-directed learning readiness (SDLR) has become a critical construct in higher education. The study investigated the relationship between SDLR and academic learning outcomes of Vietnamese undergraduate students. The study, using a sample of 1,222 students and structural equation modeling, investigated the effects of SDLR and its underlying dimensions on grade point average (GPA). The results show a positive relationship between SDLR and academic performance. However, the impact is still modest. The construct is most strongly contributed to by the SDLR components of learning management and learning control. Importantly, SDLR had a small direct effect on GPA, suggesting that its main role is in the development of long-term learning capacity rather than immediate academic performance. The study contributes to the literature by explicating the nature of the SDLR and achievement relationship, particularly in an emerging higher education system. The results underscore the importance of aligning pedagogical practices with assessment strategies in order to maximize the benefits of self-directed learning.

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1. INTRODUCTION

Higher education is undergoing significant transformation. However, this shift is not uniform across contexts. While many systems are moving toward student-centered approaches that emphasize autonomy, critical thinking, and lifelong learning [1], [2], traditional teacher-led practices remain prevalent in several countries. This tension has brought renewed attention to self-directed learning as a critical capability for students navigating complex and evolving academic environments. Self-directed learning is commonly understood as a process in which learners take initiative in identifying their learning needs, setting goals, selecting resources, and evaluating outcomes [3], [4]. Rooted in andragogical theory, self-directed learning highlights the importance of autonomy and intrinsic motivation, particularly in higher education settings [4].

Despite the growing emphasis on self-directed learning, students differ considerably in their readiness to engage in such learning processes. This has led to the development of the concept of self-directed learning readiness (SDLR), which refers to the extent to which individuals possess the attitudes, skills, and dispositions necessary for effective self-direction [5], [6]. Among the various approaches to conceptualizing SDLR, Brockett and Hiemstra [7] define SDLR as encompassing the skills and attitudes associated with self-direction in learning, thereby highlighting both cognitive and affective dimensions. In the Vietnamese higher education context, Thuy and Thuy [8] further characterizes SDLR as the degree to which students demonstrate the

attitudes and competencies required for autonomous learning, including intrinsic motivation, commitment, and personal responsibility. the model proposed by Fisher *et al.* [6] identifies three core dimensions: self-management, desire for learning, and self-control. These components capture students' ability to organize their learning activities, sustain motivation, and regulate cognitive processes. Earlier work by Guglielmino [9] conceptualized SDLR as a broader student disposition, encompassing characteristics such as initiative, independence, and persistence. While these models differ in structure, they share the view that SDLR extends beyond technical skills to include motivational and attitudinal factors. More recent research has further expanded this perspective by incorporating dimensions such as self-awareness, confidence, and adaptability, reflecting the dynamic and context dependent nature of SDLR.

Meanwhile, learning outcomes have been conceptualized from multiple perspectives, reflecting both developmental processes and measurable academic performance. According to Honey and Mumford [10], learning outcomes relate to the process through which individuals acquire new knowledge and develop previously unmastered skills. . In contrast, Biggs and Tang [11] define learning outcomes as students' overall evaluation of the knowledge and skills gained during their studies. Krathwohl [12] emphasizes the measurable dimension, describing learning outcomes as the level of achievement attained by students, typically reflected in assessment results. Similarly, Thuy and Thuy [8] associates learning outcomes with academic performance indicators such as grade point average (GPA). Taking together, these perspectives suggest that learning outcomes encompass both the process of learning and its observable results, although in empirical research, they are often operationalized through quantifiable measures such as GPA.

Empirical evidence on the relationship between SDLR and academic performance remains mixed. While several studies report a positive association between higher levels of SDLR and improved academic outcomes, others find only modest or non-significant effects. Existing research generally associates higher levels of SDLR with positive outcomes such as motivation, engagement, and academic success [13]–[15]. However, findings regarding its relationship with academic achievement remain inconsistent. While some studies report significant positive effects [14], [16], others suggest that the relationship is weak or dependent on contextual factors such as instructional design and assessment practices [17], [18]. Myllymäki *et al.* [19], Alwidyan *et al.* [5] and Thuy *et al.* [13] report a positive association between SDLR and academic achievement, the evidence is not fully consistent. In contrast, Litzinger *et al.* [20] and Grengia *et al.* [17] found no statistically significant correlation, despite descriptive trends suggesting higher SDLR among high-achieving students. Dogham *et al.* [21] emphasized that SDLR plays a crucial role in their engagement with self-directed learning, especially in online or technology mediated environments, where limited information technology skills may restrict participation and learning outcomes Zimmerman [22] revealed that undergraduate students generally exhibit moderate SDLR, with variations across academic years and fields of study. Importantly, students demonstrating higher levels of SDLR were more likely to show effective self-management, stronger intrinsic motivation, and greater engagement in learning activities, factors that are closely associated with improved academic performance. Pintrich [23] demonstrated that students with higher levels of SDLR showed greater competence in planning, monitoring, and evaluating their learning activities, which was associated with improved academic performance. Students with strong SDLR were more effective in regulating their learning strategies and responding to academic demands. Overall, the findings reveal that SDLR represents not only a personal learning characteristic but also a reliable indicator of students' capacity to attain positive academic outcomes. These findings indicate that examining SDLR as a multidimensional construct, rather than a single aggregated score, may provide a more nuanced understanding of its role in academic achievement. This suggests that the influence of SDLR may not be direct but instead operates through mediating mechanisms such as motivation, engagement, and self-regulation. Furthermore, contextual factors, including instructional design and assessment practices, may also shape this relationship.

Limited research has examined how individual components of SDLR contribute to academic performance, especially within the Vietnamese higher education system. Most existing studies rely on cross-sectional designs and aggregate SDLR scores, which restricts the ability to capture more complex relationships. In the context of Vietnamese higher education, this issue is particularly salient. Although educational reforms have promoted student autonomy, teaching and assessment practices in many institutions remain exam oriented. As a result, the extent to which SDLR translates into measurable academic outcomes remains unclear. Addressing this gap, the present study examines the structural relationship between SDLR and academic performance among Vietnamese undergraduate students. The findings are expected to contribute to a more comprehensive understanding of how different aspects of student readiness influence academic performance. Accordingly, the study is guided by the research question: what is the relationship between students' SDLR and their academic outcomes in Vietnamese universities?

This study is grounded in several complementary theoretical perspectives, including Knowles' theory of andragogy [4], Kolb's experiential learning theory [24], and the personal responsibility orientation model proposed by Brockett and Hiemstra [7]. According to Knowles [4], adult students are inherently self-directed and prefer to assume responsibility for their educational development, an orientation that aligns closely with

the core principles of self-directed learning. The theory identifies several key principles that support adult learning: the student's need to perceive the relevance of learning content, a preference for autonomy in the learning process, and the value of prior experiences as a resource for new learning. Within the context of undergraduate education, these principles imply that students who exhibit SDLR by demonstrating autonomy, actively seeking out resources, and drawing upon prior knowledge are more likely to be engaged and achieve favorable academic outcomes. Thus, the development of SDLR can serve not only to enhance academic performance but also to cultivate lifelong learning competencies.

Kolb's theory underscores the importance of students taking initiative in seeking learning opportunities, reflecting on those experiences, and modifying their strategies accordingly. Students with high levels of SDLR are more likely to engage effectively in this learning cycle, utilizing both cognitive and behavioral skills to monitor and regulate their learning. The integration of experiential learning and reflective practice contributes to deeper understanding and more effective knowledge application, ultimately enhancing GPA. As such, Kolb's theory reinforces the view that SDLR is both a prerequisite for and an outcome of meaningful learning experiences. Brockett and Hiemstra present a comprehensive theoretical model that integrates both philosophical and psychological perspectives to explain the concept of personal responsibility within self-directed learning. Their model delineates two interrelated components of self-directed learning. The first component, the self-directed learning process, emphasizes the teaching–learning dynamic in which the student assumes primary responsibility for their educational progress, while the instructor plays the role of facilitator rather than traditional knowledge transmitter.

These frameworks collectively emphasize student autonomy, experiential engagement, and individual responsibility as central to effective learning. From this perspective, SDLR is understood not merely as a set of skills but as a dynamic capacity shaped by both internal dispositions and external learning environments. In addition, the measurement frameworks developed by Guglielmino [9] and Fisher *et al.* [6] provide a basis for operationalizing SDLR in empirical research. Together, these theoretical foundations support a comprehensive examination of how SDLR influences academic performance in higher education. Building upon these theoretical underpinnings, the proposed research framework forms the basis for accomplishing the study objectives and addressing the research questions is presented in Figure 1.

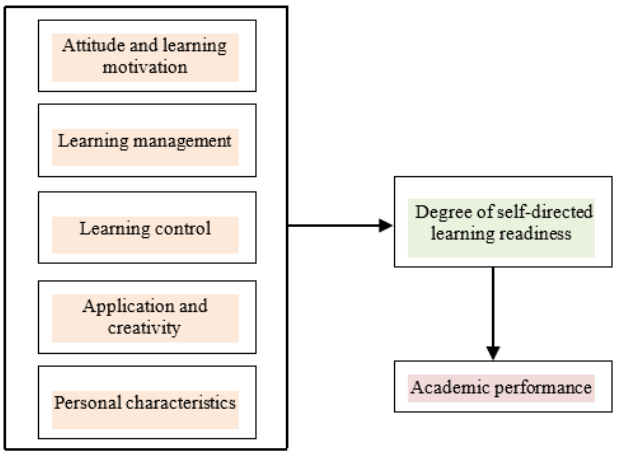

Figure 1. Research model

The proposed research framework conceptualizes SDLR as a multidimensional construct influenced by factors such as attitudes and learning motivation, learning management, learning control, application and creativity, and personal characteristics. Attitude and learning motivation reflect students' intrinsic interest, commitment to learning, and perceived relevance of academic activities, which influence their engagement in self-directed learning, consistent with the andragogical principles of Knowles and the SDLR framework of Guglielmino. Learning management and learning control represent students' capacity to plan, organize, monitor, and regulate their learning processes, aligning with self-regulation principles and the experiential learning cycle proposed by Kolb, as well as extended SDLR models developed by Fisher *et al* [6]. In addition, application and creativity capture students' ability to apply knowledge, develop transferable skills, and engage in creative problem-solving, while personal characteristics encompass personality traits, self-awareness, and responsibility for learning. They are presented in variables such as attitudes, learning motivation, autonomy,

self-regulation of learning. The proposed research framework conceptualizes SDLR as a multidimensional construct influenced by factors such as learning motivation, self-management, self-regulation, and personal characteristics. These dimensions reflect students' capacity to plan, monitor, and adapt their learning processes in response to academic demands. Academic performance, operationalized through GPA, serves as the outcome variable in the model. The framework assumes that different components of SDLR may exert varying degrees of influence on academic achievement, thereby providing a more detailed understanding of the mechanisms underlying student learning outcomes.

2. METHOD

2.1. Instrument

This study utilized a quantitative research design to investigate the relationship between SDLR and academic learning outcomes among undergraduate students. The survey instrument employed in this study was originally developed by Thuy and Thuy [8], following a systematic and theory informed process to ensure validity and reliability. It consists of multiple dimensions, including: i) learning management; ii) learning control; iii) attitude and motivation; iv) application and creativity; v) confidence; and vi) self-awareness. All items were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Reliability and validity were assessed using Cronbach's alpha (α) and exploratory factor analysis (EFA). All constructs met the acceptable threshold (α>0.70), indicating strong internal consistency. All constructs met the acceptable threshold (α>0.70), indicating strong internal consistency [25].

2.2. Research sample

The scope of this study was confined to full-time undergraduate students enrolled in first to fourth-year programs across six higher education institutions in Vietnam. The sample was drawn using a stratified selection approach to ensure regional and institutional representativeness. Six higher education institutions were selected to reflect the three major geographical regions of Vietnam (North, Central, and South). The participating universities are comprehensive, multidisciplinary institutions, thereby enhancing the generalizability of the findings across diverse academic contexts. These institutions represented a diverse range of universities, including national university system members, regional universities, and private universities, all offering multidisciplinary education. Eligible participants included students from the first to the fourth year of study. Faculties and classes were selected in alignment with the predefined disciplinary clusters to ensure coverage across major fields of study. An additional inclusion criterion required that all participants voluntarily consent to take part in the survey. Only students who agreed to participate and were willing to provide informed responses were included in the final sample. This sampling strategy was designed to maximize regional diversity, disciplinary breadth, and voluntary participation, thereby strengthening the representativeness and ethical integrity of the study.

The sample size was determined using the formula by Krejcie and Morgan [26] for a population greater than 50,000 was used to calculate the required number of survey responses. The sampling process followed a systematic protocol involving coordination with university faculties and instructors to obtain survey permissions, explanation of survey objectives and procedures to participants, and supervised collection of completed questionnaires. To ensure adequate representation, 1,500 questionnaires were distributed evenly across the six universities (250 per institution). A total of 1,235 responses were collected from students spanning all three regions of Vietnam. After data cleaning to remove incomplete or invalid responses (e.g., uniform answers across all items), 1,222 valid questionnaires remained for analysis. This sample size exceeded the minimum required sample plus a 10% margin of error (n=1,174), achieving a response rate of 81.5%. The sample composition included 32.7% of students from universities in northern Vietnam, 33.5% from central Vietnam, and 33.8% from southern Vietnam. Survey participants across all academic years (first through fourth year) primarily represented two major disciplinary domains, namely science and engineering, and social sciences and humanities, as shown in Table 1.

Table 1. Statistics of survey sample

Criteria	Respondent groups	Gender	
		Male students	Female students
Training sectors	Science and technology	25.37%	23.73%
	Social sciences and humanities	14.33%	36.57%
	Total	*39.70%*	*60.30%*
Academic year	First-year students	9.66%	14.89%
	Second-year students	10.72%	13.83%
	Third-year students	9.74%	16.12%
	Fourth-year students	9.58%	15.46%
	Total	*39.70%*	*60.30%*

Out of a total sample of 1,222 students, the distribution of female students across academic years was relatively balanced, with proportions of 14.89%, 13.83%, 16.12%, and 15.46% from the first to the fourth year, respectively. Similarly, the proportion of male students showed minimal variation across years, ranging from 9.58% to 10.72%. The survey participants were enrolled in a diverse range of academic disciplines, including information technology (20%); electronic engineering, electronics, and mechanical engineering (15%); forestry, agriculture, technology, and environmental studies (15%); pedagogy (10%); and economics, tourism, and related fields (40%).

Regarding academic performance, 97% of respondents reported a cumulative GPA of 2.0 or higher. Most participants (67.18%) had GPAs ranging between 2.0 and 3.2, while more than one-third achieved GPAs of 3.2 or above. Only a small proportion (2.95%) reported GPAs below 2. These statistics indicate that the sample predominantly consisted of students with moderate to high academic achievement.

2.3. Data analysis

Data was analyzed using Pearson correlation analysis; structural equation modeling (SEM) and Multiple regression analysis. The analysis was conducted using SPSS and SmartPLS. Model validity was assessed using standard criteria, including composite reliability (CR), average variance extracted (AVE), and variance inflation factor (VIF) [25]. Pearson correlation analysis was conducted to examine the linear relationships among key variables. To assess the reliability and validity of the measurement constructs, the study utilized confirmatory factor analysis and validation techniques within the framework of SEM. SEM was employed to evaluate both the measurement model and the structural model, thereby allowing for an examination of the causal relationships between components of SDLR and indicators of academic learning outcomes. In addition, multiple regression analysis was performed to evaluate the influence of independent variables on academic performance. This process included the assessment of key regression assumptions, such as normality of residuals, multicollinearity (using VIF values), and homoscedasticity, to ensure the robustness of the regression results. All statistical analyses were conducted using SPSS and SmartPLS.

3. RESULTS AND DISCUSSION

3.1. Results

The correlation between the SDLR score and the cumulative GPA across various factors such as attitude, learning management, application and creativity, learning control, confidence, and self-awareness shows a connection between these factors and students' academic performance. This correlation is presented in Table 2. Overall, cumulative GPA was positively associated with total SDLR ($r=0.059$, $p=0.042$). At the factor level, statistically significant but weak positive correlations were observed for attitude ($r=0.068$, $p=0.018$) and learning control ($r=0.072$, $p=0.013$). No statistically significant correlations were found between GPA and the remaining SDLR dimensions, including learning management, application and creativity, confidence, self-awareness, and responsibility ($p>0.05$). Although the observed effect sizes were small, the findings suggest that specific components of SDLR particularly attitudinal orientation and learning control may have a modest association with academic performance.

The reliability and convergent validity of the measurement model were evaluated using Cronbach's α, CR, AVE, and indicator outer loadings within the PLS-SEM framework. Consistent with established methodological guidelines, internal consistency was considered satisfactory when CR values exceeded 0.70 and outer loadings were greater than 0.40. Convergent validity was confirmed when AVE values surpassed the recommended threshold of 0.50, in accordance with the Fornell and Larcker criterion [27]. As presented in Table 3, all retained constructs demonstrated adequate internal consistency, with Cronbach's α coefficients ranging from 0.742 to 0.896 and CR values between 0.851 and 0.917, exceeding the recommended minimum of 0.70. Furthermore, AVE values ranged from 0.579 to 0.661, indicating that each construct explained more than 50% of the variance of its indicators and thus satisfied the requirement for convergent validity.

Table 2. Correlation between cumulative GPA and SDLR factors

SDLR factor	Pearson correlation	Sig. (2-tailed)
TD	0.068*	0.018
KN	0.018	0.531
VD	0.026	0.375
KS	0.072*	0.013
TT	0.045	0.118
NT	0.053	0.066
CD	0.044	0.128
SDLR total	0.059*	0.042

Note: TD=attitude, KN=learning management, VD=application and creativity, KS=learning control, TT=confidence, NT=self-awareness, and CD=responsibility. *Correlation is significant at the 0.05 level.

Table 3. Internal consistency reliability testing results

Factor	Cronbach's α	CR	AVE
KN	0.896	0.917	0.579
KS	0.827	0.878	0.591
NT	0.742	0.854	0.661
TD	0.781	0.859	0.604
TT	0.767	0.851	0.590
VD	0.825	0.877	0.588

Note: TD=attitude, KN=learning management, VD=application and creativity, KS=learning control, TT=confidence, and NT=self-awareness.

However, the responsibility construct exhibited Cronbach's α coefficient below 0.60, indicating insufficient internal consistency reliability. Consequently, this construct was excluded from the final structural model. Overall, the remaining constructs met the recommended thresholds for reliability and convergent validity, supporting the adequacy of the measurement model for subsequent structural analysis.

Following the exclusion of the responsibility construct due to inadequate CR, the revised measurement model consisted of six latent constructs. Discriminant validity was evaluated using both the Fornell-Larcker criterion and the heterotrait-monotrait ratio of correlations (HTMT), as recommended in recent PLS-SEM literature. As shown in Table 4, the square roots of the AVE for each construct exceeded the corresponding inter-construct correlations, thereby satisfying the Fornell-Larcker criterion. In addition, all HTMT values were substantially below the conservative threshold of 0.85, indicating a clear distinction among the latent constructs. Collectively, these results provide strong evidence of discriminant validity for the retained six-factor model.

The bootstrap procedure was employed to assess the statistical significance of the model parameter. The original dataset consisted of 1,222 observations, with each bootstrap sample maintaining the same size. It is recommended that the number of bootstrap samples be at least equal to the number of valid observations in the dataset. Accordingly, 5,000 bootstrap iterations were conducted to satisfy the requirements for SEM analysis.

Multicollinearity within the structural model was evaluated using the VIF. The results in Table 5 indicated no evidence of multicollinearity, as all VIF values were below the commonly accepted threshold of 3 (VIF<3). The model's explanatory power was assessed by examining the coefficient of determination (R^2) values. Table 6 shows that the adjusted R^2 value for the academic performance model is 0.015, and the adjusted R^2 value for the SDLR model is 0.978, meeting statistical standards for model fit. The closer the value is to +1, the stronger the correlation between variables. Further analysis in the structural equation model examines statistical significance (with a p-value≤0.05) and the total effect.

Table 4. Discriminant validity according to Fornell-Larcker criterion after internal consistency testing

Factor	KN	KS	NT	TD	TT	VD
KN	0.761					
KS	0.599	0.769				
NT	0.590	0.582	0.813			
TD	0.421	0.516	0.401	0.777		
TT	0.460	0.539	0.543	0.462	0.768	
VD	0.572	0.628	0.496	0.537	0.542	0.767

Note: TD=attitude, KN=learning management, VD=application and creativity, KS=learning control, TT=confidence, and NT=self-awareness.

Table 5. Model fit

Model	R^2	Adjusted R^2
SDLR	0.978	0.978
KQHT	0.016	0.015

Note: KQHT=academic performance.

Table 6. Direct effects of relationships

Relationship	Effect size	Standard deviation	t-value	p-value
KN → SDLR	0.287	0.009	33.335	0.000
KS → SDLR	0.250	0.009	28.859	0.000
NT → SDLR	0.127	0.008	16.682	0.000
TD → SDLR	0.227	0.010	23.491	0.000
TT → SDLR	0.169	0.008	22.066	0.000
VD → SDLR	0.204	0.007	27.451	0.000
SDLR → KQHT	0.126	0.030	4.262	0.000

Note: KQHT=academic performance, TD=attitude, KN=learning management, VD=application and creativity, KS=learning control, TT=confidence, and NT=self-awareness.

The results (presented in Table 6) indicate that the most significant factors influencing SDLR are "learning management" (effect size β=0.287) and "learning control" (effect size β=0.250), followed by "application and creativity" and "attitude" (effect sizes β=0.240 and β=0.227, respectively). Other factors have smaller effect sizes (confidence β=0.169, self-awareness β=0.127). The effect of SDLR on academic performance is β=0.126.

The analysis presented in Table 7 and Figure 2 indicates that, although the effect sizes range from 0.016 to 0.036, all six factors exert a statistically significant indirect influence on students' academic performance, albeit with relatively weak effect magnitudes. The impact of the independent variables on SDLR decreases in the following order: learning management, learning control, attitude, application and creativity, confidence, and self-awareness. All corresponding hypotheses are supported at the 95% confidence level. These results suggest that learning management, learning control, attitude, application and creativity, confidence, and self-awareness collectively contribute to the development of SDLR, which subsequently affects academic performance. However, the strength of this indirect effect remains limited, indicating that other factors may also play critical roles in determining academic outcomes.

These findings are reinforced by the high mean scores observed in key dimensions such as learning management, learning control, application and creativity, and attitude. The structural equation model further elucidates the strength of these relationships. Among the predictors of SDLR, learning management (β=0.287) and learning control (β=0.250) emerged as the most influential factors. These were followed by application and creativity (β=0.240) and attitude (β=0.227), indicating a consistent pattern of positive contributions to SDLR. Despite these strong internal predictors, the impact of SDLR on academic performance remains relatively modest (β=0.126), suggesting that while SDLR plays a supportive role, it may not directly translate into higher academic achievement without the presence of other mediating or contextual factors.

Table 7. Indirect effects of relationships

Relationship	Effect size	Standard deviation	t-value	p-value
KN → KQHT	0.036	0.009	4.243	0.000
KS → KQHT	0.032	0.008	4.188	0.000
NT → KQHT	0.016	0.004	4.127	0.000
TD → KQHT	0.029	0.007	4.242	0.000
TT → KQHT	0.021	0.005	4.161	0.000
VD → KQHT	0.026	0.006	4.232	0.000
SDLR → KQHT	0.126	0.030	4.262	0.000

Note: KQHT=academic performance, TD=attitude, KN=learning management, VD=application and creativity, KS=learning control, TT=confidence, and NT=self-awareness.

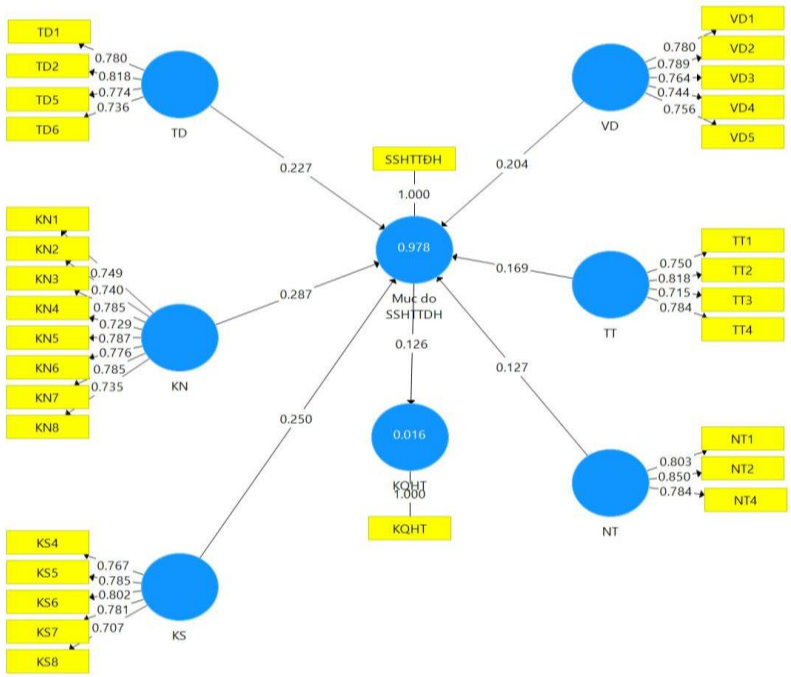

Figure 2. Structural model of the relationship between SDLR and students' learning outcomes

3.2. Discussion

The findings of this study offer significant results of relationship between SDLR and academic performance. Although SDLR demonstrates a statistically significant association with GPA, the relatively small effect size suggests that its influence should not be overstated. SDLR functions as an enabling condition that supports broader learning processes, rather than acting as a direct predictor of academic achievement. This interpretation aligns with perspectives derived from Knowles' theory in terms of autonomy and lifelong learning rather than immediate performance outcomes. From the perspective, students with higher SDLR are better equipped to navigate complex learning environments, even if these advantages are not fully reflected in conventional metrics such as GPA. The findings are also relevant to Kolb's experiential learning theory, which emphasizes the iterative processes of reflection, experimentation, and adaptation in learning [24]. SDLR facilitates these processes by enabling students to engage more actively with their learning experiences. However, the benefits of the engagement may not translate directly into higher grades when assessment remains predominantly exam oriented.

The study also contributes a significant result by identifying the differential roles of SDLR components. Among, learning management and learning control emerged as the strongest predictors of SDLR, emphasizing the importance of self-regulation in learning. These findings are consistent with prior research that highlights the elements of planning, monitoring, and management as central to effective learning by Fisher *et al.* [6], Guglielmino [9], and Thuy and Thuy [8]. In contrast, the other factors such as self-awareness and confidence, while theoretically important, exhibited weaker effects, suggesting that their influence may be more indirect or context dependent. The weak direct effect of SDLR on academic performance may also reflect broader structural and cultural factors. In contexts where learning is still largely guided by instructors and assessment emphasizes knowledge reproduction, opportunities for exercising self-directed learning may be limited. As a result, even students with high SDLR may not fully realize its benefits of measurable academic outcomes.

These findings suggest that the relationship between SDLR and academic achievement is mediated by both pedagogical practices and assessment systems. Without corresponding changes in instructional design and evaluation methods, the potential of SDLR to enhance academic performance may remain underutilized. From a practical perspective, the findings suggest that promoting self-directed learning is insufficient. That requires higher education institutions to shift toward autonomy supportive pedagogies, including project based and inquiry-based learning. Assessment strategies should be aligned with higher order competencies rather than rote knowledge and structured support should be provided for developing self-directed learning skills. Those changes would create conditions under which SDLR can more effectively translate into academic success.

However, several limitations should be acknowledged in this study. The sample was limited to undergraduate students enrolled in full-time training programs. Therefore, data were collected across all three geographical regions of Vietnam, but the distribution of participants was representative only in terms of sample size and did not proportionally reflect student populations from each region or institution. Moreover, the cultural factors were not included in the questionnaire. As a result, the findings provide a general overview of factors influencing SDLR among undergraduate students, without offering discipline-specific or institution-specific insights. The use of GPA as the sole indicator of academic performance may not adequately capture the broader competencies associated with self-directed learning. Alternative outcome metrics like critical thinking, problem-solving skills, or a focus on lifelong learning should be included in future research. Furthermore, the cross-sectional design restricts the capacity to determine causality. To investigate how SDLR evolves over time and how it affects learning trajectories outside of college, longitudinal research is required. Additionally, the study does not specifically take into consideration contextual factors like cultural norms, institutional support, or instructional design. More thorough models that incorporate these elements should be used in future studies.

4. CONCLUSION

This study provides evidence on the relationship between SDLR and academic performance among undergraduates in Vietnam. The results show that, while SDLR is positively associated with GPA, its effect is modest, suggesting that its primary value lies in supporting long-term learning development rather than immediate academic achievement. By clarifying the effects of SDLR on the student learning outcomes and its internal dimensions, the study advances current understanding of student autonomy in higher education. It also emphasizes the need for the alignment among pedagogy, assessment, and student development to fully realize the benefits of self-directed learning.

Practically, the findings provide useful insights for higher education institutions and instructors in identifying both the capability (can do) and motivation (will do) aspects, including key attitudes and behaviors required for effective self-directed learning to achieve effective academic outcomes. While the study does not claim direct curricular prescriptions, it offers an empirical basis for informing the design of teaching approaches and assessment practices aimed at improving learning quality and aligning with national qualifications frameworks. In addition, the study establishes a foundation for future research on the measurement and evaluation of SDLR in higher education contexts.

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C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo : **Fo**rmal analysis
I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

CONFLICT OF INTEREST STATEMENT

We confirm that, this paper is our own research product. The paper is our original research result without a conflict of interest in connection with manuscripts. We do not have competition of interests of political, personal, religious, ideological, academic, and intellectual aspects with other individuals or associations. We have no pressure of financial interests or personal relationships that influence the work reported in this paper.

INFORMED CONSENT

We have obtained informed consent from all individuals included in this study.

ETHICAL APPROVAL

The study was conducted based on ethical principles during the data collection process. The research related to human use has been complied with all the relevant national regulations and institutional policies and has been approved by the authors' institutional review board or equivalent committee.

DATA AVAILABILITY

The data that support the findings of this study are available on request from the corresponding author, [LTH], on request.

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