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THE IMPACT OF SELF-DIRECTED LEARNING ON EMPLOYABILITY: INSIGHTS FROM CONSTRUCTION AND ARCHITECTURE STUDENTS IN VIETNAM

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ABSTRACT

This study examines the influence of self-directed learning (SDL) on the employability of architecture and construction students in Vietnam. Using data from 463 participants and Structural Equation Modeling (SEM), it analyzes four SDL dimensions: learning motivation, self-management, cooperative learning, and information quality. Results show that learning motivation, self-management, and especially cooperative learning significantly enhance employability. However, information quality does not exhibit a direct effect. The study introduces Expectations from Self (EFS) reflecting psychological capital as a new variable. EFS positively moderates the impact of cooperative learning but unexpectedly weakens the influence of information quality on employability. These findings suggest that students with higher self-expectations benefit more from collaborative learning, while those with lower EFS rely more on information quality. The study contributes to employability theory by integrating EFS and underscores the importance of embedding SDL and personalized support into curriculum design to better prepare graduates for complex labor market demands.

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1. Introduction

As society and technology changes exponentially, higher education should adequately equip graduates with not just know-how, but the skills for lifelong learning. Of particular relevance is a special kind of competence, self-directed learning (SDL) which provides learners with competence to recognize needs, establish goals, choose strategies and evaluate the outcomes without external control (Knowles, 1975). SDL is now popular in educational reforms in Asia (in Hong Kong, South Korea and Vietnam) particularly for supporting autonomy governance and accountability (Mok, 2007; OECD, 2000; Wilcox, 1996). With Vietnam's transition in the labor market, particularly in construction and architecture, skills such as critical thinking and adaptability are adding to the importance of SDL for individuals. These curricula that focus on teaching to cover content frequently do not serve these needs (Morris et al., 2023; Rogers & Freiberg, 1994). Such lifelong learning ability is necessary now and as SDL facilitates the adaptability needed in a knowledge-based economy (Geng et al., 2019; Louws et al., 2017), and is associated with skills needed for employability such as problem-solving, teamwork, and information literacy (Douglass & Morris, 2014; Silén & Uhlin, 2008).

Institutional dynamics provoked institutions to turn to blended and self-regulated learning methods promoting learners' self-direction (Leary et al., 2019; Sumuer, 2018; Uz & Uzun, 2018). However, only few studies have investigated the link between SDL and employability, especially in the field of architecture and its related disciplines (Bridgstock, 2009; Tymon, 2013). Employability requires not only technical competencies but also soft skills such as communication and self-management (Salleh et al., 2016; Shannon, 2012), yet imbalances remain, especially in multidisciplinary domains (Suhaili et al., 2015; Oluwatayo, 2016). The purpose of this research is to examine the influence of SDL on the employability of students in a developing country like Vietnam majoring in Architecture and Construction, which is in line with Knowles' (1975) SDL theory, Knight and Yorke's (2003) USEM model as well as Tomlinson's (2017) Graduate Capital Model (particularly psychological capital). Shot is the suggestion of Expectations from Self (EFS) as a moderating variable. Although psychological capital is well-researched, the contribution of EFS which includes self-efficacy, confidence aspiration and resilience as they influence the SDL-employability nexus is under-investigated. This research provides implications for curriculum and policy reform in Vietnam and other learners' centred system.

2. Theory and hypotheses

2.1. Theory

Self-Directed Learning

Self-directed learning (SDL) is the method by which people take the initiative, with or without the help of others, diagnosing their own learning needs, formulating their own learning goals, choosing and implementing appropriate learning strategies, and evaluating learning outcomes (Knowles, 1975). The key SDL characteristics autonomy, motivation, and adaptability are particularly useful for, e.g., considering the architecture and construction fields, the profile of an agent is facing lifelong learning. The present study investigates four SDL dimensions: learning motivation, self-management, cooperative learning, and information quality which reflect learner's self-agency and self-regulation. Educationalists such as Iwasiw (1987), and Spencer and Jordan (1999) further developed the works of Knowles, accentuating the need of learners to take responsibility of planning and assessing

their own education. It helps foster cognitive, psychomotor and affective development and is associated with flexibility, independence and proficient use of information (O'Shea 2003, Tekekol & Demirel, 2018). It also encourages continuing education in all disciplines and at all levels (Robinson & Persky, 2020; Silén & Uhlin, 2008).

Academics stress SDL as the means to develop resilience and adaptability for the work that is to come (Douglass & Morris, 2014; Du Toit-Brits, 2015). Leary et al. (2019) argue that problem-based learning promotes SDL through the development of learner autonomy. With the rapid development of digital learning, students are required to control, process and construct knowledge independently (Geng et al., 2019; Sumuer, 2018). Online learning environments, i.e. MOOCs, require strong self-regulation and time management (Uz & Uzun, 2018; Zhu et al., 2020). It enables employees in a work context to experience continuous learning and versatility, particularly in rapidly changing fields such as ICT, health and engineering (Haworth, 2016; Lemmetty & Collin, 2020; Loeng, 2020). And as technology transforms the labor market, integrating SDL into higher ed is critical for preparing students to succeed in the long term.

Employability

Employability is defined as an individual' capacity to perform activities with knowledge, skills, and cognitive strategies, as well as the adjustment to new work requirements (Hackman & Oldham, 1976; Pinder, 2014). CV is multidimensional concept including transferable skills, personal attributes and professional competences that people need to be successful in today's competitive labor market (Rahmat et al., 2012). Andrews and Higson (2008) highlight that academic and personal capabilities are essential on the long run, for career building.

This article builds on the USEM model (Knight & Yorke, 2003) which conceptualises employability in terms of Understanding, Skills, Efficacy beliefs, and Metacognition. These conditions contribute to reflective learning and confidence and are consistent with primary elements of self-directed learning (SDL), which include motivation, collaboration, and self-regulation. Furthermore, Tomlinson's (2017) Graduate Capital Model also guides this investigation by bringing attention to psychological capital, including self-efficacy, confidence, aspiration and resilience. In this context, Expectations from Self (EFS) is proposed as a moderator factor, which holds students' inner image of themselves. EFS moderates the impact of SDL competencies on employability impacts, high-EFS students benefiting from information quality, and low-EFS students acquiring more from collaboration.

Despite a greater focus on employability, refuge entrepreneurship skills are still not well integrated into many programmes, such as architecture (Shannon, 2012). Much Work based learning has been advocated between curriculum content and occupational practice (Harvey, 2005). In contemporary context, employers are not only seeking technical competence but candidates who possess transferable or soft skills such as communication, domain knowledge, team work, adaptability (Osmani et al., 2015; Suleman, 2018), highlighting the importance for education systems to be in sync with formal workplace skill requirements (Dacre Pool & Sewell, 2007; Tran, 2015; Okolie et al., 2020).

2.2. Hypotheses

Within the study of performance in academic and career settings, understanding the determinants of employability is both requisite and complex. These factors underscore not only important characteristics for graduate success,

but also foundational elements inherent in students' developmental trajectories in academic and professional settings. Shannon (2012) claims that 'lifelong learning ability' is considered by employers to be the second most important graduate attribute, after 'self-management'. In the same vein, Maina & Daful (2017) discovered that a large number of architecture students overestimate the quality of their skills of organisation and time management that employers believe as necessary to workplace productivity. The study is based on Knowles' (1975) theory of self-directed learning, which holds that for learning to be achieved, there must be the element of taking ownership and responsibility for learning among the learners themselves.

Additionally, it draws on Knight and Yorke's (2003) USEM model, which frames employability in terms of Understanding, Skills, Efficacy beliefs, and Metacognition four dimensions developed through proactive, reflective learning experiences. Finally, Tomlinson's (2017) Graduate Capital Model, particularly its psychological capital dimension, highlights the internal traits (e.g., self-efficacy, aspirations, confidence) that empower students to apply their learning effectively in professional contexts. Based on these conceptual foundations and the reviewed empirical evidence, the following hypotheses are proposed:

Hypothesis H1: Students' learning motivation has a positive impact on employability.

Learning motivation is a key driver of self-directed behavior, enabling students to set learning goals, engage in knowledge-seeking, and remain resilient through challenges (Knowles, 1975). Within the USEM framework, motivated learners are more likely to cultivate deep understanding and develop strong self-beliefs (Knight & Yorke, 2003). Tomlinson (2017) further posits that students with higher psychological capital those who are more self-confident and aspirational are better positioned to channel motivation into employability-enhancing outcomes.

Hypothesis H2: Students' self-management ability has a positive impact on employability.

Self-management encompassing goal setting, time management, and self-monitoring is vital for lifelong learning (Knowles, 1975) and features prominently in the Skills and Metacognition dimensions of the USEM model. Effective self-management enhances students' ability to meet academic and professional demands. Tomlinson's (2017) psychological capital theory suggests that students with strong self-regulatory capabilities and high self-efficacy are more likely to transition successfully into professional roles.

Hypothesis H3: Students' cooperative learning ability has a positive impact on employability. While SDL traditionally emphasizes learner autonomy, collaboration is increasingly recognized as a key component of 21st-century learning. Empirical studies have consistently shown that teamwork is one of the most valued competencies among employers (Shannon, 2012; Salleh et al., 2016). Salleh et al. (2016) ranked teamwork among the top three skills sought during the recruitment process, while Falk (2012) emphasized its critical role in preparing graduates for cooperative work environments. Cooperative learning fosters critical thinking, communication, and adaptability all of which align with the USEM model's Skills and Efficacy components. According to Tomlinson (2017), students with lower psychological capital may particularly benefit from peer collaboration as a way to build self-confidence and develop a sense of professional identity.

Hypothesis H4: The quality of information and learning materials has a positive impact on employability.

In today's digital economy, the ability to access, evaluate, and apply high-quality information is essential for academic and career success. Siddiq et al. (2017) found that digital information management is a vital skill, while Savage et al. (2009) highlighted the importance of critical thinking in selecting and applying information, especially in fields focused on sustainability. Shum et al. (2016) underscored that learning analytics and digital literacy are increasingly important in knowledge-intensive domains. While high-quality information is a resource, Knowles (1975) argued that learners must be equipped with the motivation and self-discipline to use it effectively. Within the USEM framework, information quality contributes to both Understanding and Metacognition. Moreover, Tomlinson's (2017) model indicates that students with stronger psychological capital are more likely to proactively engage with high-quality information, enhancing their employability outcomes.

Moderating role of students' expectations from self

Employability results from a mix of internal competencies and external influences, including motivation, self-management, collaboration, and information use (Andrews & Higson, 2008; Suleman, 2018). The impact of these skills may vary based on a learner's expectations from self, a construct related to psychological capital (Tomlinson, 2017). Psychological capital comprising self-efficacy, resilience, confidence, and goal orientation affects how students convert academic learning into career outcomes. Knowles' (1975) self-directed learning (SDL) theory highlights the role of autonomy and intrinsic motivation, while Knight and Yorke's (2003) USEM model emphasizes that employability relies on understanding, skills, efficacy beliefs, and metacognition. Expectations from self connect these frameworks, acting as a mechanism that influences how effectively students apply SDL skills to career development. Learners with high self-expectations show more confidence, ambition, and persistence, reinforcing the SDL-employability relationship. In contrast, students with lower expectations may engage less deeply with learning, weakening the impact of SDL on employability (Tomlinson, 2017). Based on this theoretical synthesis, the following hypotheses are proposed:

According to Knowles (1975), motivated learners actively seek and integrate knowledge, but this behavior is more effective when paired with strong psychological capital. Students with elevated expectations from themselves are more likely to align their intrinsic motivation with career-oriented goals (Dacre Pool & Sewell, 2007; Osmani et al., 2015). This aligns with the USEM model's emphasis on efficacy beliefs as a foundation for employability (Knight & Yorke, 2003).

Hypothesis H5a: Students' expectations from self moderate the relationship between learning motivation and employability, such that the positive effect of learning motivation on employability is stronger for students with higher expectations from self.

Self-management, an SDL skill involving time management, goal-setting, and personal accountability, is amplified when learners possess high self-efficacy and confidence (Knowles, 1975; Rahmat et al., 2012). According to Tomlinson (2017), students with high psychological capital are more likely to exhibit professional adaptability, enhancing the link between self-regulation and employability outcomes.

Hypothesis H5b: Students' expectations from self moderate the relationship between self-management ability and employability, such that the positive effect of self-management on employability is stronger for students with higher expectations from self.

Cooperative learning fosters interpersonal communication, teamwork, and collaborative problem-solving skills central to the USEM model's "Skills" component and highly valued by employers (Freudenberg et al., 2011; Knight & Yorke, 2003). However, learners with strong self-belief and psychological capital are more likely to contribute meaningfully in team settings and derive greater employability benefits from these experiences (Suleman, 2018; Matsouka & Mihail, 2016).

Hypothesis H5c: Students' expectations from self moderate the relationship between cooperative learning ability and employability, such that the positive effect of cooperative learning on employability is stronger for students with higher expectations from self.

Access to accurate and relevant information supports informed decision-making and career alignment (Osmani et al., 2015). Yet, as Knowles (1975) noted, the ability to act on this information depends on learners' autonomy and initiative. Within the USEM model, this links to metacognition and understanding. Students with high expectations from themselves, as described by Tomlinson (2017), are more inclined to actively engage with, interpret, and apply knowledge resources to enhance their employability (Torres-Machí et al., 2013).

Hypothesis H5d: Students' expectations from self moderate the relationship between information quality and employability, such that the positive effect of information quality on employability is stronger for students with higher expectations from self.

2.2. Research model

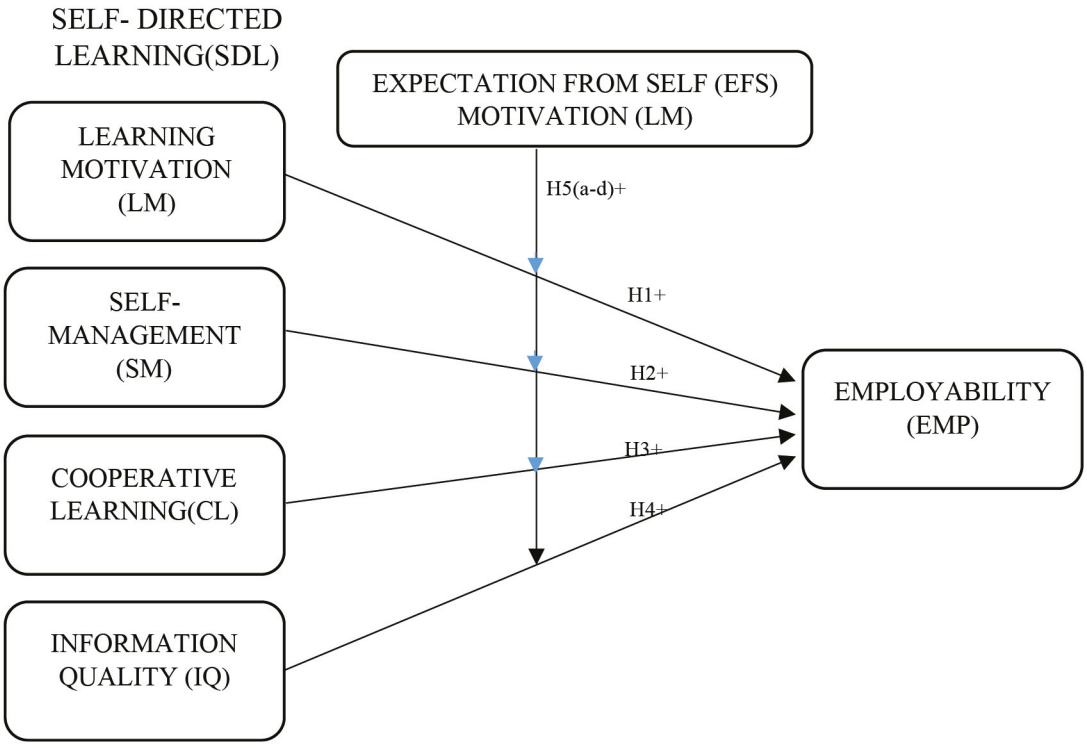

Figure 1. The hypothesized model

This model clarifies the specific relationships between the four dimension of self-directed learning abilities and the employability skills of students and the potential moderating role of students' expectations from self on key factors such as learning motivation, self-management ability, group learning ability, and the quality of information, this model provides a comprehensive view of the learning and personal development process of students.

3. Data and research methods

3.1. Research Sample

The study was conducted on students majoring in architecture, urban planning, construction, and infrastructure from universities throughout Vietnam.The selected participants help enhance the diversity of the sample due to the inclusion of students from various universities in order to provide valuable and highly applicable insights.

3.2. Measurements

Self-Directed Leaderning comprised 4 dimensions were measured using the questionnaire utilized by Chen et al. (2019), with questions adjusted to fit the industry with Motivation for Learning (8 questions), Self-Management Skills (11 questions), Colloborative Learning (5 questions), and Quality of Knowledge and Information (6 questions). Employability was measured by Work Skills scale consisting of 13 questions, were adapted to suit the research objectives. These questions were derived from the Engineering Council's (EAC) Handbook and were used in the survey for Saad et al. (2013). Expectation from self was adaped from Morshidi et al. (2024) with 3 items (*see Appendix 1 online*). The collected data were analyzed using SPSS 29.0 and SEM 29.0 to examine the relationships between the four factors of self-directed learning ability and the employability of students.

Characteristics of respondents

The study's respondents were selected from a sample of students majoring in architecture, urban planning, construction, and infrastructure at universities throughout Vietnam. The sample consisted of 463 respondents, with 348 male students (75.16%) and 115 female students (24.84%). In terms of academic year distribution, 281 students (66%) were in their third year, 111 (24%) in their fourth year, and 66 (14%) in their fifth year. Geographically, the respondents came from a variety of regions, with the Southeast region having the most participation (47.52%), followed by the Red River Delta (36.50%) and the Mekong Delta (9.94%). Other regions, such as the North Central and Coastal (3.46%), Northern Midlands and Mountains (2.16%), and Central Highlands (0.43%), had smaller representation (*see Appendix 2 online*). This diverse group of participants provides a comprehensive view of self-directed learning (SDL) and employability in Vietnam, spanning various educational and regional backgrounds.

4. Results and discussions

4.1. Results

Scale reliability testing and exploratory factor analysis

Employability (EMP) is assessed through 13 factors, demonstrating strong internal consistency with a Cronbach's Alpha coefficient of 0.942. The learning motivation (LM) scale is composed of 8 factors with a Cronbach's Alpha of 0.924, On the other hand, the self-management (SM) scale is composed of 11 factors, obtaining a Cronbach's Alpha of 0.932. Cooperative learning (CL) is assessed in 5 dimensions, Cronbach's Alpha = 0.848. Equally, the Information Quality (IQ) scale from 5 factors has a Cronbach's Alpha of 0.849 and the EFS scale provides a Cronbach's Alpha of 0.812. All indicators in these scales have a

total correlation coefficient above 0.3 with their corresponding constituents, so the reliability can be validated. Moreover, exploratory factor analysis (EFA) results for all the scales reached the necessary statistical guidelines: the Kaiser-Meyer-Olkin (KMO) sampling adequacy measure was acceptable ($0.5 \leq KMO \leq 1$), Bartlett's test of sphericity was significant (sig < 0.05), and the Eigenvalue for an extracted factor was ≥ 1 (Hair et al., 2019). These results indicate that the measurement scales are robust and suitable for further analysis (*see Appendix 3 online*).

Statistical description, correlation and reliability analysis

Table 1 shows the descriptive statistics, reliability evaluation, and correlation analysis, including the square root of the Average Variance Extracted (AVE) values. The results show that the Composite Reliability (CR) values are between 0.813 to 0.942. Fornell and Larcker (1981) found that the constructs had high internal consistency and dependability, with values exceeding the 0.70 criterion. Furthermore, the square root of the AVE values exceeds the correlation coefficients, demonstrating the constructs' convergent validity (Hair et al., 2019). Henseler et al. (2015) stated that the HTMT value must be < 0.85 (Cheung et al., 2024). The research results showed that the values of the HTMT index of each factor were all < 0.85; therefore, the criteria for discriminant value (*see Appendix 4 online*)

Table 1. Descriptive statistics, correlations and reliability results

Variable	M	SD	CR	AVE	1	2	3	4	5	
CL	3.9594	0.82739	0.848	0.527	**0.726**					
EFS	3.8330	0.96820	0.813	0.592	0.472***	**0.770**				
EMP	3.9169	0.82416	0.942	0.554	0.494***	0.612***	**0.744**			
IQ	3.9881	0.75754	0.849	0.485	0.444***	0.548***	0.470***	**0.696**		
LM	3.8448	0.92284	0.924	0.604	0.460***	0.635***	0.556***	0.464***	**0.777**	
SM	3.9597	0.81444	0.933	0.557	0.419***	0.532***	0.476***	0.445***	0.551***	**0.746**

Note: *Symble*** *p <0.001, values in paratheses are the square root values of AVE. CL: Cooperative Learning, EFS: Expectation From Self, EMP: Employability, IQ: Information Quality, LM: Learning Motivation, SM: Self Management*

For testing the construct validity, confirmatory factor analyses (CFA) are performed, and the CFA results show that the model's fit is acceptable (*see Appendix 5 online*), with a p-value of 0.001 and a chi-square/df ratio of 1.141, meeting the requirement of being less than 2. The indices indicate that the model fits the market data well (CFI =0. 988; GFI =0.908; TLI = 0.988, meeting the requirement of being greater than 0.9; RMSEA =0 .017, which is less than 0.08). According to Hair et al. (2019), a GFI value greater than 0.8 is still acceptable. Therefore, it can be concluded that the model ensures an overall adequate fit.

Hypothesis testing

The interrelationships between distinct structures of the structural model were investigated using IBM SPSS statistical software and Structural Equation Modeling (SEM) version 29. Table 2 contains summaries of the analytical results.

Table 2. Fit indices for the structural model and results for hypotheses 1 through 4

Hypotheses	Estimate	t- value	p-value	Conclusion
H1 –Learning Motivation (LM) → Employability (EMP)	0.175	3.791	0.000	Supported
H2 – Self-Management Skills (SM) → Employability (EMP)	0.136	2.843	0.004	Supported
H3 – Cooperative Learning Ability (CL) → Employability (EMP)	0.224	4.541	0.000	Supported
H4 –Information Quality (IQ) → Employability (EMP)	0.025	0.459	0.646	Not supported
Coefficient of Determination (R^2) Employability (EMP)	0.355			
Model Fit				
CMIN/df = 1.693; the goodness-of-fit (GFI) = 0.852; TLI = 0.935; CFI = 0.938; và RMSEA = 0.039				

The study looked at how students' learning motivation, self-management abilities, collaborative learning ability, and information quality influence their employability. Table 2 shows that the fit indices meet acceptable thresholds (Hair et al., 2019). The CMIN/df value is 1.141, GFI = 0.908, TLI = 0.988, CFI = 0.988, and RMSEA = 0.017. The coefficient of determination for employability (R^2) is 0.355, indicating that these four factors account for 36% of the variance in employability. The research confirms Hypothesis 1 by finding a substantial positive link between learning motivation and employability (b = 0.175, t = 3.791, p < 0.001). Similarly, self-management abilities have a substantial effect on employability (b = 0.136, t = 2.843, p < 0.005), supporting Hypothesis 2. Collaborative learning capacity is a significant predictor of employability (b = 0.224, t = 4.541, p < 0.001), supporting Hypothesis 3. However, the relationship between information quality and employability is not statistically significant (p > 0.05), prompting the rejection of Hypothesis 4. Furthermore, cooperative learning capacity has the greatest impact on employability of any self-directed learning characteristic, with a beta value of 0.224. This is followed by self-management abilities (β = 0.136) and learning motivation (β = 0.175). These findings highlight the importance of collaborative learning and individual motivation in preparing students for employment.

Moderated model analysis

To further examine the moderating effect of Expectation from Self (EFS) on the relationship between the four dimensions of self-directed learning and students' employability (Hypotheses 5a, 5b, 5c, and 5d), moderated analyses were conducted using AMOS 29 (*see Appendix 6 online*, *Table 3*). To visualize and interpret the moderating role of EFS, a simple slope analysis was performed following the methodological approach outlined by Dawson (2014). This analytical strategy facilitated a deeper understanding of how variations in students' self-expectations influence the strength and direction of the relationship between self-directed learning factors and employability outcomes.

Table 3. Results of moderation analysis

	Estimate	S.E.	C.R.	P-value	Conclusion
EMP ← Z.EFSxZ.LM	0.048	0.028	1.724	0.085	Not supported
EMP ← Z.EFSxZ.SM	0.040	0.026	1.510	0.131	Not supported
EMP ← Z.EFSxZ.CL	0.079	0.027	2.929	0.003	Supported
EMP ← Z.EFSxZ.IQ	-0.063	0.027	-2.318	0.020	Not Supported

The results from the SEM analysis indicate that Expectation from Self (EFS) significantly moderates the relationships between cooperative learning (CL) and employability (EMP), as well as between information quality (IQ) and employability. However, no significant moderating effect was observed in the relationships between learning motivation (LM) and employability, or self-management (SM) and employability, leading to the rejection of Hypotheses 5a and 5b. Further analysis using simple slope graphs (*see Appendices 7 and 8 online*) revealed that in the case of cooperative learning and employability, high self-expectations positively moderate this relationship. This suggests that students with greater self-expectations derive more benefit from learning in team, reinforcing Hypothesis 5c. Conversely, the moderation effect of EFS on the relationship between information quality and employability was found to be negative. This indicates that students with lower self-expectations exhibit a stronger relationship between information quality and employability, contradicting Hypothesis 5d. These findings suggest that self-expectations play a nuanced role in shaping how different dimensions of self-directed learning contribute to students' employability.

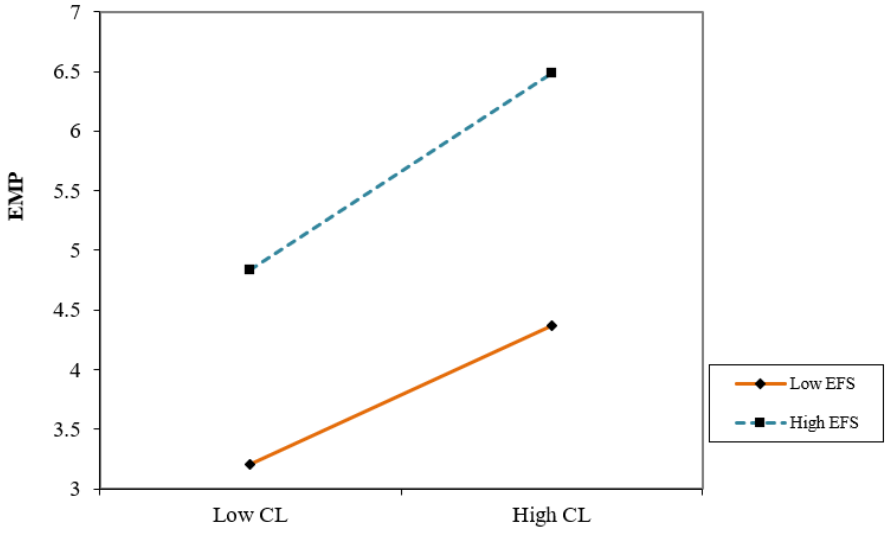

Figure 2: The moderation effect of EFS on the relationship between CL and EMP

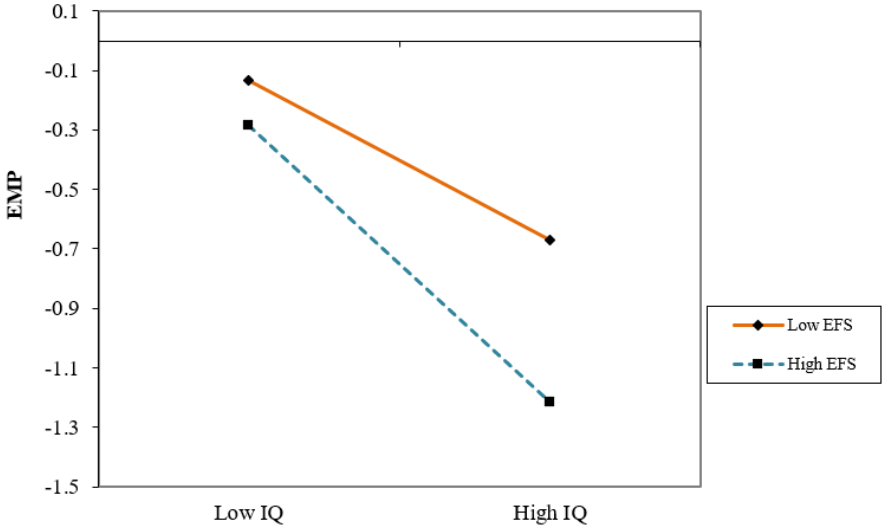

Figure 3: The Moderation Effect of EFS on the relationship between IQ and EMP

4.2. Discussions

The findings of this study provide significant insights into the relationship between self-directed learning (SDL) and students' employability in Vietnam's construction and architecture fields. Using IBM SPSS Statistics and Structural Equation Modeling (SEM), this study identified learning motivation, self-management skills, and cooperative learning ability as key determinants of employability. These findings align with prior research highlighting the importance of both technical and soft skills for career readiness (Salleh et al., 2016; Shannon, 2012). Specifically, the study confirmed that learning motivation positively impacts employability (H1), which is consistent with previous studies emphasizing the role of self-driven learning in enhancing graduates' career prospects (Shannon, 2012; Zhang et al., 2014). Students who exhibit strong motivation for learning are more likely to adapt to industry demands and remain competitive in the job market. Self-management skills also demonstrated a positive and significant relationship with employability (H2), reaffirming earlier findings that emphasize the need for students to develop autonomy and problem-solving abilities (Knowles, 1975; O'Shea, 2003). The ability to independently set learning objectives, manage time effectively, and apply knowledge in real-world scenarios enhances students' readiness for employment.

Cooperative learning ability was the most influential factor among the SDL dimensions, significantly impacting employability (H3). This finding supports previous research, which highlights teamwork and collaboration as highly valued skills by employers (Falk, 2012; Salleh et al., 2016). Given the collaborative nature of the construction and architecture industries, students who actively engage in group learning experiences are better prepared for professional environments that require teamwork and interdisciplinary cooperation. However, contrary to expectations, information quality did not have a significant impact on employability (H4). This result challenges previous assumptions that access to high-quality information directly influences students' job readiness (Siddiq et al., 2017; Shum et al., 2016). One possible explanation is that while information availability is important,

it may not be sufficient on its own to enhance employability. Instead, the ability to critically analyze and apply information may play a more crucial role in career development.

Moderating role of Students' Expectations from Self

This study also looked at the moderating role of expectations from self (EFS), a construct expressing psychological capital, in the link between self-directed learning (SDL) aspects and employability. The findings provide detailed insights into how internal learner dispositions influence employment outcomes. EFS significantly regulated two interactions. First, it had a favorable impact on the relationship between cooperative learning and employability, demonstrating that students with greater self-expectations gain more from collaborative environments, most likely because of their proactive participation and confidence in team-based settings. Second, there was a negative moderation effect between information quality and employability, implying that students with lower EFS value structured, high-quality learning materials more, possibly because they rely more on external guidance to compensate for lower self-confidence (Zhang et al., 2014).

In contrast to predictions, EFS did not significantly alter the connections between learning motivation, self-management, and employability (H5a, H5b). This contradicts prior research (e.g., Macaskill & Denovan, 2013), which found that psychological capital improves the impact of intrinsic motivation and self-regulation on job readiness. A likely explanation is that these SDL characteristics are intrinsically independent of self-perception even students with lower self-expectations may have strong intrinsic motivation or engage in goal planning and time management as part of organized academic routines. In such circumstances, external frameworks and academic standards may compensate for weaker internal beliefs, allowing these students to gain employability-related abilities regardless of EFS. This finding emphasizes EFS's context-sensitive role, implying that it has a greater impact in areas requiring interpersonal engagement (e.g., teamwork) or critical application of unstructured knowledge (e.g., digital content) than in routine academic behaviors such as goal setting or personal organization. These findings emphasize the necessity of personalizing SDL interventions not just to promote technical and motivational competencies, but also to address students' self-perceptions in order to help them reach their full potential in a variety of learning environments.

5. Conclusion

This study contributes empirical evidence on the influence of self-directed learning (SDL) on the employability of students in Vietnam's architecture and construction fields, positioning EFS, psychological capital, as a critical moderating factor. Among the SDL dimensions, cooperative learning demonstrated the strongest positive effect, followed by learning motivation and self-management, underscoring the combined importance of individual agency and collaborative competence in workforce preparation. Conversely, information quality showed no direct effect on employability, suggesting that access to information alone is inadequate without the analytical skills necessary for its effective use. These findings offer both conceptual clarity and practical guidance for enhancing graduate readiness in increasingly dynamic labor markets.

A key theoretical contribution of this research is the inclusion of Expectations from Self (EFS) as a moderator in the SDL–employability relationship. The results reveal that students with higher self-expectations benefit more from quality information, while those with lower EFS gain more from collaborative learning

environments. This extends existing frameworks by incorporating psychological capital as a vital factor in employability development. From a practical perspective, the study emphasizes the importance of embedding SDL-enhancing practices such as project-based learning, peer interaction, and reflective exercises into higher education curricula. Moreover, interventions should be differentiated based on student self-perception, with support mechanisms like mentoring and coaching aimed at boosting self-efficacy and academic aspirations. By doing so, institutions can better equip students for long-term adaptability and career success.

Limitations

Despite its contributions, this study is subject to several limitations. First, it is cross-sectional, limiting the ability to infer causal relationships between SDL and employability outcomes. Second, the sample was confined to students in architecture and construction programs within Vietnam, which may restrict the generalizability of findings to other disciplines or international contexts. Third, the study relied on self-reported data, which may be influenced by social desirability bias or inaccurate self-assessment. Additionally, while EFS was used as a proxy for psychological capital, future research could benefit from a more granular assessment of psychological dimensions such as resilience, optimism, and goal orientation.

Future studies should adopt longitudinal designs to track the impact of SDL over time, particularly across different career stages. Expanding the research to include diverse academic disciplines and institutional settings will enhance external validity. Moreover, incorporating employer evaluations of graduate performance can offer a more comprehensive perspective on how SDL translates into workplace effectiveness. Further exploration of how technological tools and learning analytics can support personalized SDL interventions would also be valuable in optimizing educational outcomes in digitally mediated environments.

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