APSSHS

Academic Publications of Social Sciences and Humanities Studies
2023, Volume 3, Issue 1, Page No: 1-10
Available online at: https://apsshs.com/

Journal of Applied Organizational Systems and Behavior

Investigation of Factors Influencing Students' Academic Results in Project Subjects Oriented CDIO at Vinh University

Grace Y. Tan[1], Daniel Ho[1], Wei Ming Lim[2]*, Rachel Koh[3]

1. Department of Organizational Behavior, School of Business, National University of Singapore, Singapore.
2. Department of Individual Behavior Studies, Faculty of Social Sciences, University of Queensland, Brisbane, Australia.
3. Department of Organizational Psychology, Faculty of Management, University of Toronto, Toronto, Canada.

Abstract

Project-based instruction aligned with the CDIO model has emerged as a forward-thinking pedagogical method aimed at preparing graduates to meet the increasing demands for competent professionals. This study centers on evaluating the influence of several determinants—Learning motivation, Learning methods, Consistency in learning, Competition in learning, and the University brand—on the academic results of learning project subjects designed within the Project subjects oriented CDIO framework at Vinh University. Adopting a quantitative design, researchers surveyed a sample of 200 students from multiple academic disciplines and processed the findings using the Structural Equation Modeling (SEM) technique. The analysis revealed four significant predictors of academic performance: three established influences—Learning Method, Consistency in learning, and University Brand—as well as an emergent variable, referred to as "will to learn," which demonstrated a constructive link to student outcomes. Based on these findings, the study outlines several practical interventions aimed at enhancing these variables to improve student performance in CDIO-oriented project subjects, thus supporting all four foundational dimensions of the CDIO educational philosophy.

Keywords: Vinh university, Academic results of learning project subjects, Project subjects oriented CDIO, CDIO

How to cite this article: Tan GY, Ho D, Lim WM, Koh R. Investigation of factors influencing students' academic results in project subjects oriented CDIO at Vinh university. J Appl Organ Syst Behav. 2023;3(1):1-10. https://doi.org/10.51847/5U97CUDx76

Received: 26 January 2023; **Revised:** 10 March 2023; **Accepted:** 11 March 2023
Corresponding author: Wei Ming Lim
E-mail ✉ wei.lim@gmail.com

Introduction

The CDIO framework serves as a strategic model to revamp educational programs, narrowing the disparity between academic training and industry demands. It initiates a comprehensive reform process that promotes holistic development in learners, encompassing both theoretical proficiency and essential practical competencies, thereby equipping them to swiftly adapt to dynamic professional landscapes.

The principal objective of CDIO-based education is to ensure that graduates possess a balanced set of technical and interpersonal capabilities required to meet evolving societal expectations and workforce standards. This method cultivates adaptable learners who can refine their study techniques for continuous improvement.

Among the core attributes of CDIO pedagogy are its emphasis on experiential, integrated learning and the generation of a workforce with advanced professional qualifications. By aligning training institutions with employer expectations, the CDIO approach ensures that graduates are functionally prepared for real-world occupational roles.

When instruction is delivered through CDIO's project-oriented methodology, course content is organized around investigative articles on particular topics. These projects aim to deepen comprehension by critically exploring the subject matter, assessing its merits and limitations, and offering well-reasoned suggestions or interventions.

Engaging students in such project-based coursework proves especially beneficial for audiences unfamiliar with the research area, as it provides a broad contextual understanding. These academic endeavors allow learners to conduct in-depth inquiries under the mentorship of faculty supervisors, contributing meaningfully to the curriculum's goals. The use of CDIO-directed project modules in university programs fosters a focused investigation into specific themes within academic disciplines, supporting the completion of program requirements.

Modern academic evaluation no longer centers solely on knowledge acquisition. Today's learners expect universities to equip them with practical competencies they can apply throughout their careers [1]. Therefore, assessments must reflect students' achievement of instructional aims and contribute directly to the enhancement of their educational outcomes. This implies that evaluations must gauge knowledge, skill sets, and attitudes within relevant, applied contexts—an approach known as competency-based assessment [2].

CDIO-based project evaluations typically revolve around the model's four central pillars: Conceive, Design, Implement, and Operate. Effective measurement of learning outcomes, in line with desired graduate attributes, requires that educators actively shape student competencies and provide real-world scenarios where they can apply academic knowledge, practical abilities, and personal insight to solve problems.

Vinh University's sustained commitment to CDIO has proven to be a strategic and effective path. A majority of faculty members acknowledge the transformative impact of this approach on teaching practices, ultimately leading to improved training quality and enhanced alignment with job market expectations.

Literature identifies several variables influencing students' academic performance in CDIO-focused project subjects. The first set includes learner-specific characteristics such as study motivation, personal learning strategies [3, 4], and the presence of academic competition [5]. While the impact of competition remains debated, these factors generally support stronger learning outcomes.

Secondly, research on socioeconomic conditions suggests that higher educational investment from families can bolster academic performance [6].

Thirdly, institutional attributes, including the reputation and perceived brand value of universities [7, 8], indirectly enhance student engagement and outcomes by reinforcing learner confidence [9]. Other significant contributors include the quality of facilities [10, 11] and the availability of financial support through scholarships [12, 13], both of which positively influence student success in CDIO-aligned coursework.

Over the last five years, implementing CDIO-style project courses at Vinh University has yielded favorable feedback. Students generally find this mode of learning engaging and rewarding. Many report that these projects facilitate self-discovery, improve collaboration skills, and nurture both analytical and imaginative thinking. Nonetheless, there remains a disconnect between the CDIO-oriented coursework and its perceived real-world relevance. Specifically, students often struggle to see the practical value of assignments when compared to the expectations of working professionals. Moreover, current teaching strategies fall short of fully leveraging the benefits of creativity, autonomy, teamwork, and healthy competition among students.

Drawing from prior research, this study develops a model to investigate the factors that affect academic outcomes in CDIO-oriented project learning. The findings at Vinh University reveal that while study motivation did not significantly impact academic performance, other variables—namely learning consistency, academic competitiveness, and institutional brand reputation—demonstrated a positive correlation with student achievement. Additionally, the study introduces a novel determinant: the "Will to study," which emerged as a crucial factor influencing learning outcomes in CDIO-aligned project subjects. These insights contribute both theoretically and practically, offering university leadership and faculty members a clearer understanding of existing influences on student performance. As a result, this knowledge can inform necessary revisions to educational objectives, curriculum design, course outlines, and pedagogical practices to enhance future outcomes in CDIO project-based learning.

Hypotheses and literature review

Literature review

University education aims to equip students with essential competencies to ensure success in their professional journeys. Learners actively engage in academic environments to absorb both theoretical insights and hands-on experience, striving to internalize all necessary competencies for career development [14, 15]. Within the framework of CDIO capacity development, educational outcomes extend beyond rote learning to encompass the innovative application of acquired knowledge across diverse real-world scenarios, embedding learning in authentic contexts [2]. According to standard number 11 from the CDIO's twelve established benchmarks, student outcomes reflect achievements in communication and personal development, as well as proficiency in conceiving and constructing products, processes, and systems alongside domain-specific expertise.

In project-based learning that adheres to CDIO principles, the emphasis leans more toward the practical ability to generate products, processes, and systems rather than solely on theoretical knowledge or interpersonal skills. Thus, learners undertaking such projects must demonstrate not only what they have learned in academic settings but also how they integrate personal and

educational experiences to address complex tasks. This integration allows observers to assess students' cognitive capabilities, leadership traits, ethical grounding, and enthusiasm. However, such assessments are not designed to capture the entirety of a subject or educational program, as true capacity reflects a synthesis of knowledge, technical proficiency, moral values, emotional intelligence, and broader societal development.

Student performance in CDIO-aligned project modules is shaped by both internal (subjective) and external (objective) influences. Subjective elements pertain to personal attributes of the learners themselves, such as Learning Motivation, Learning Methods, and Learning Competition.

Research has consistently indicated that motivation plays a pivotal role in academic success. Learning motivation can be intrinsic—where the student is genuinely curious and enjoys acquiring knowledge—or extrinsic, where the drive stems from external incentives like high grades, recognition, or fear of failure [16]. Without any form of motivation, students resemble aimless travelers without a clear destination [17].

Regarding Learning Methods, Feldman [3] emphasizes that the strategies employed in higher education significantly influence student efficacy. Thanh Huong NHAC and Nguyen Binh Minh LA [18] propose that a well-structured study schedule, understanding the aims of a project beforehand, and adapting learning techniques to each subject—such as engaging deeply with assigned readings, independently seeking supplementary material, and preparing lessons in advance—are crucial. These practices, along with cognitive engagement (such as the ability to self-learn, take comprehensive notes, synthesize information, and apply concepts to real tasks) and interactive strategies (like active classroom discussions, teamwork, scholarly debates, and participation in research), foster deeper involvement in project work [19]. Ultimately, such engagement leads to stronger mastery of both subject matter and essential skills, improving overall academic outcomes [20].

When it comes to Learning Competition, existing literature highlights its significant role in social interaction and personal ambition. Success in various life domains often hinges on competitive drive, which reflects an individual's determination and commitment to excel. Nevertheless, there remains ongoing discourse regarding the balance between the beneficial and detrimental impacts of competitive behavior [5].

On the other hand, objective determinants such as familial background and institutional support also shape learning experiences. Checchi [6] argues that a family's socio-economic status influences the educational investments made in a child's future. Despite college students enjoying greater autonomy and personal responsibility, familial support still exerts a considerable impact on academic success [21, 22].

Institutional factors, particularly the perceived reputation of the university, also play a major role. The perceived prestige of a higher education institution affects not only student confidence but also parental and employer expectations. When students view a university as reputable, they tend to trust its capacity to prepare them adequately for professional life, thereby reinforcing their own academic motivation and optimism about future career prospects [9]. Additionally, the availability of robust infrastructure and financial support, such as scholarships, further motivates students and enhances their engagement with academic research and study [10, 11].

Hypotheses

Learning Motivation and Academic Results in Learning Project Subjects Oriented CDIO

H1: There is a beneficial impact amongst Learning Motivation and Learning outcomes of students' project subjects.

Consistency in Learning and Learning Results in CDIO-Oriented Project Subjects

H2: There is a beneficial impact amongst Consistency in learning and the Learning results of students' project subjects.

Competition in Learning and Learning Results of CDIO-Oriented Project Subjects

H3: There is a beneficial impact amongst Competition in learning and the Learning results of students' project subjects.

Learning Method and Learning Result of CDIO-Oriented Project Subjects

H4: There is a beneficial impact amongst the University's brand name and the Learning results of students' project subjects.

University's Brand Name and Learning Results in CDIO-Oriented Project Subjects

H5: There is a beneficial impact amongst the Learning method and the Learning results of the students' project subjects.

A conceptual framework summarizing these five hypotheses is presented in **Figure 1**.

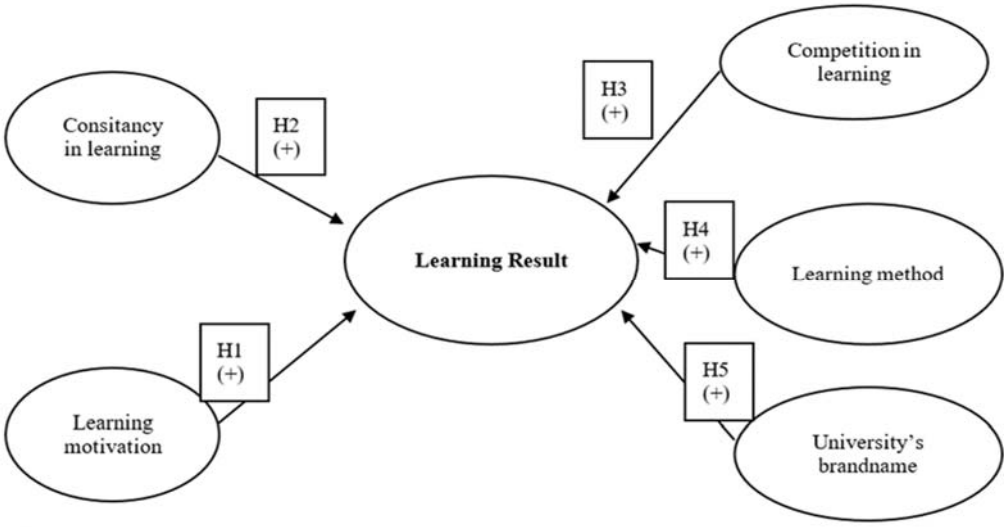

Figure 1. Theoretical model of the study

Materials and Methods

Research model and scale

The research model is developed using six latent variables, each represented by specific surveillances figures:

- Learning result (KQ) includes 04 surveillances figures from Young *et al*. [23], with an additional item KQ5 added by the authors: "In general, I have learned a lot of knowledge, skills, improved professional attitude in studying project modules" to correspond with the CDIO pillars.
- Consistency in learning (KD) consists of 07 surveillances figures adapted from Le [24] and Cole *et al*. [25].
- Learning motivation (DC) has 04 surveillances figures as indicated by Cole *et al*. [25].
- Competition in learning (CT) includes 04 surveillances figures based on Tho *et al*. [9] and Thornton *et al*. [26].
- University's brand name (TH) contains 04 surveillances figures drawn from Aaker [7] and Balmer & Liao [8].
- Learning method (PP) comprises 14 surveillances figures from Nguyen *et al*. [27] and Feldman [3].

Variables are measured via a 5-point Likert scale, ranging from 1: very dissatisfied (Never) to 5: very satisfied (Very often). Measurement indicators were adjusted in line with the traits of the research sample, informed by previous studies.

Following Checchi's [6] model, the basic theoretical model is expressed as:

KQi = KQ (DC, KD, CT, TH, PP)

Research sample

This study employed a non-probability sampling strategy, specifically utilizing the convenience sampling method. To ensure representation across the population, data were stratified according to academic specialization, year of study, and gender among students enrolled at Vinh University. Participants ranged from first-year to fifth-year students. A total of 200 responses were gathered via an online survey tool (Google Docs), all of which were deemed valid, resulting in 0 unusable responses. According to Hair *et al*. [28], a suitable sample size should be at least five times the number of observed variables. Given that this study involved 38 observed variables, the minimum required sample size was 190. With 200 valid responses, the dataset was sufficient for statistical analysis. Data collection was carried out over a two-month period, from October to November 2021.

Data processing

A quantitative approach was used for data analysis, with processing performed using SPSS and AMOS software. The first step was to verify the internal consistency of the measurement scale using Cronbach's Alpha, requiring a threshold greater than 0.7. Following this, Exploratory Factor Analysis (EFA) was conducted to assess both discriminant and convergent validity. The criteria for factor acceptability included factor loadings above 0.5, Eigenvalues equal to or exceeding 1, a KMO coefficient between 0.5 and 1, significance levels below 0.05, and an explained variance rate exceeding 50%. Once EFA validation was complete, Confirmatory Factor Analysis (CFA) was carried out using AMOS to test the structural adequacy

of the proposed model. The model's fitness was further evaluated through Structural Equation Modeling (SEM), adhering to established benchmarks: chi-square/df < 3 [29], GFI, TLI, and CFI values > 0.8, and RMSEA < 0.09 [30].

Results and Discussion

Testing the scale consistency

As presented in **Table 1**, all constructs achieved Cronbach's Alpha coefficients within the range of > 0.8 and < 0.95. These results confirm a high level of internal consistency across the measurement instruments, indicating that the scales were well-constructed and capable of clearly differentiating the variables in question.

Table 1. Cronbach's Alpha coefficient through Assessment of the consistency of the scale

No.	Variables	Abbreviations	Cronbach's Alpha coefficient
1	Learning result	KQ	0.925
2	Consistency in learning	KD	0.920
3	Learning motivation	DC	0.820
4	Competition in learning	CT	0.930
5	University's brand name	TH	0.841
6	Learning method	PP	0.949

EFA

Given that this study incorporates various measurement scales from multiple international research contexts, there was no in-depth qualitative analysis undertaken to validate the interpretation of terminologies and the conceptual basis of these instruments. Nevertheless, findings indicate that the questionnaire items were comprehensible to participants, and students demonstrated a clear grasp of the questions and their intended meaning. To further determine the appropriateness and internal structure of the measurement tools, an Exploratory Factor Analysis (EFA) was conducted.

The implementation of EFA for scale evaluation adhered to the following methodological parameters:

- Promax rotation combined with Principal Axis Factoring for factor extraction was applied.
- Each item was required to meet a minimum factor loading threshold of 0.5 to ensure statistical relevance.
- In alignment with Jabnoun & Al-Tamimi [31], a distinction of at least 0.3 between the highest factor loading and any other loading for a given item was used as a criterion to confirm discriminant validity.
- As recommended by Anderson & Gerbing [32], the total variance explained by the factors needed to be 50% or higher.
- According to the standard described by Nguyen *et al*. [33], the Kaiser-Meyer-Olkin (KMO) measure was required to be 0.5 or above, and the Bartlett's test of sphericity had to reach statistical significance (Sig < 0.05).

Table 2. Result of EFA analysis

EFA analysis	KMO index	P-value	Extracted Variance Figure	Load Figure	Conclusion
Independent	0.933	0.000	72.688	All >0.5	Ensure analysis request
Dependent	0.854	0.000	77.583	All >0.5	Ensure analysis request

Based on the analysis associated with the dependent variable Learning result **(Table 2)**, the data meet the criteria for factor audit as they fulfill multiple statistical conditions: all extracted factors have Eigenvalues equal to or exceeding 1, the KMO coefficient lies between 0.5 and 1, the significance level (Sig.) is less than 0.05, and the total variance explained surpasses 50%. Additionally, the dataset satisfies the requirements for both "Convergence value" and "Discriminatory value", confirming its suitability for further evaluation.

Table 3. Independent and dependent variables for Rotation matrix in EFA investigation

Pattern Matrixa					
	Component				
	1	2	3	4	5
PP05	.996				
PP06	.915				
PP03	.800				
PP07	.793				
PP02	.773				

PP01	.750				
PP08	.719				
PP09	.706				
PP04	.704				
PP13	.690				
PP12	.655				
CT3		.852			
KD2		.849			
CT4		.834			
CT2		.781			
KD1		.671			
KD6			.852		
KD4			.849		
KD3			.834		
KD7			.781		
KD5			.671		
KQ				.918	
KQ4				.879	
KQ3				.788	
KQ1				.766	
TH4					.907
TH3					.841
TH2					.740

Method of Extraction: Analysis of Principal Component.
Rotation Method: Promax with Kaiser Normalization.
a. Variation converged in 7 restatements.

In the last EFA, there are 4 factors drawn **(Table 3)**:

- Factor 1: PP1 → PP09, PP12 and PP13 → Name it “Learning method” (PP)
- Factor 2: CT2 → CT4, KD1, KD2 → Rename it "Will to study project subjects" (YC)
- Factor 3: KD3 → KD7 → Named "Consistency in learning" (KD)
- Factor 4: TH2 → TH4 → Name it "University's brand name" (TH)
- Overall variance withdraw (total described variation) is 73.634% (>50%) and KMO = 0.930 (>0.5), Bartlett test has statistical significance (Sig=0.00<0.05). Then, the hypotheses are re-established as follows:

H1: Excluded from the analysis.
H2: Consistency in learning demonstrates a significant and positive influence on the Learning results of students engaged in project-related subjects.
H3': A proportional connection is evident between the students’ Will to study project courses and their Learning results within those courses.
H4: The University's brand name shows a favorable impact correlating with the Learning results of students participating in project subjects.
H5: The Learning method employed exhibits a meaningful positive relationship with students’ Learning results in project-based subjects.

CFA

The Confirmatory Factor Analysis (CFA) in this study relies on four main criteria to evaluate how well the model aligns with the market data, namely the Comparative Fit Index (CFI), Chi-squared statistic, Goodness of Fit Index (GFI), and the Root Mean Square Error of Approximation (RMSEA). A model is considered a good fit when the CFI and Tucker-Lewis Index (TLI) are equal to or exceed 0.9, the overall model value is at least 0.8, and the RMSEA value is below 1 **(Figure 2)**.

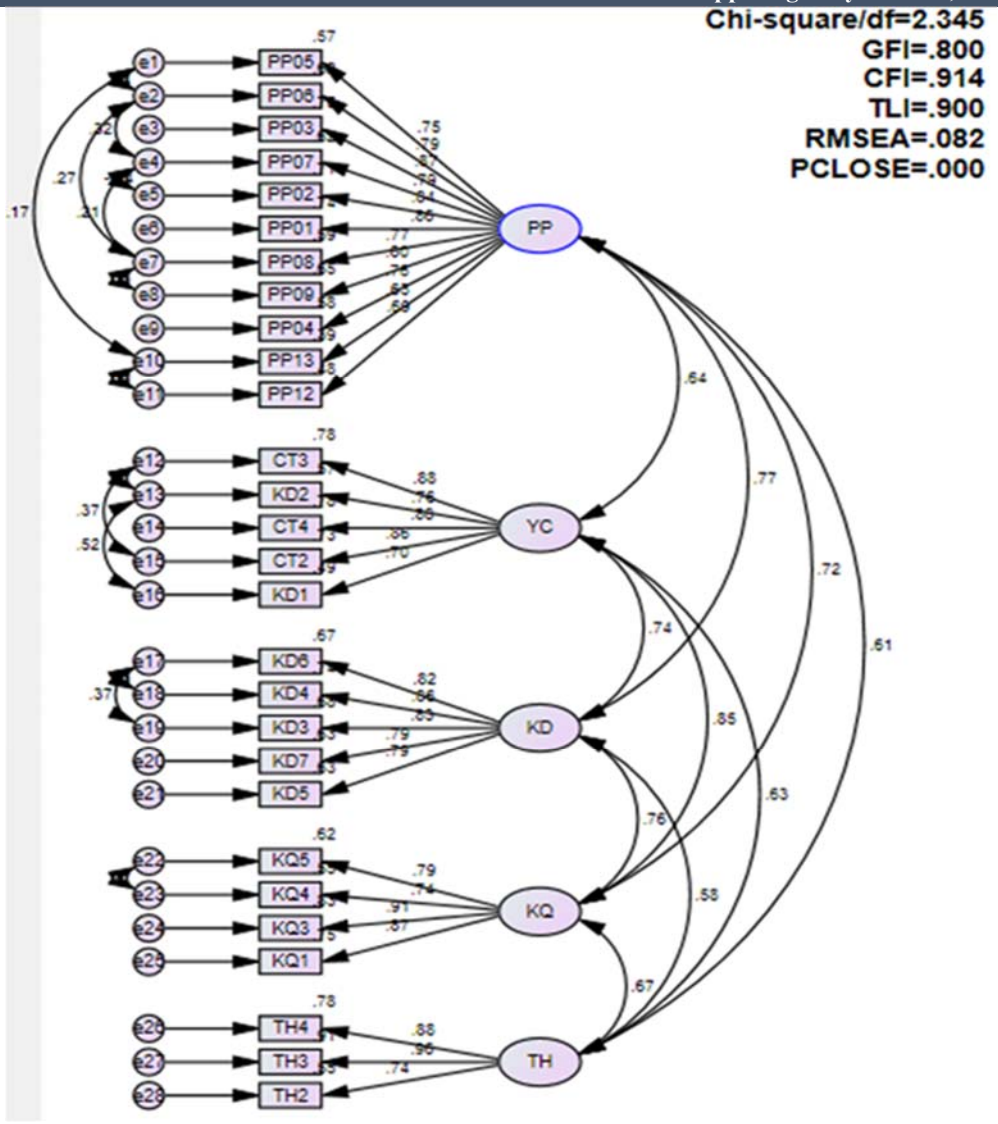

Figure 2. Model of factors affecting Learning results in learning project subjects of students at Vinh University

The measurement model comprises 328 degrees of freedom. The CFA results indicate that the model fits well with the collected data, demonstrated by a Chi-Square/df ratio of 2.345, which is below the threshold of 3 and appropriate for a sample size of 200. The Goodness of Fit Index (GFI) is exactly 0.80 (meeting the minimum criterion of ≥0.80), while the Comparative Fit Index (CFI) is 0.914 (exceeding the ≥0.90 benchmark), and the Tucker-Lewis Index (TLI) is 0.90 (also meeting the ≥0.90 standard). The RMSEA value is 0.082, which falls below the acceptable limit of 0.09, collectively indicating that the model structure is well-suited. Furthermore, CFA analysis reveals that all factor loadings exceed 0.5 and are statistically significant with P-values equal to 0.0000, confirming strong convergent validity of the constructs [32].

SEM analysis

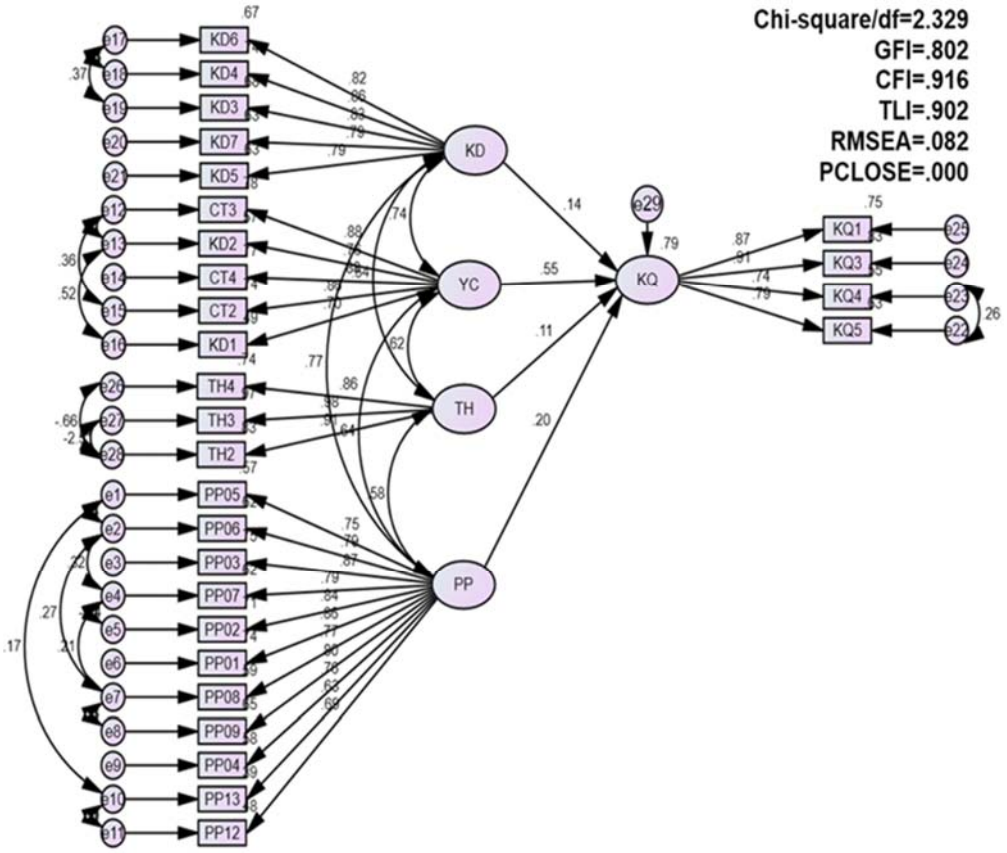

Figure 3. SEM Model

The composite indices obtained in the evaluation of the SEM model, illustrated in **Figure 3** for the research framework, demonstrate satisfactory fit: Chi-square/df equals 2.329 (below the cutoff of 3); P-value is 0.000; GFI stands at 0.802 (exceeding 0.8); TLI is 0.902 (above 0.9); CFI reaches 0.916 (greater than 0.9); and RMSEA measures 0.082 (less than 0.09) [34].

The assessment of path coefficients within the model confirms the suitability of the research model, with all hypotheses supported at a significance level of $P < 0.05$.

Referring to the P-values listed in **Table 4** alongside the hypotheses outlined in Section 4.2, the conclusions are as follows:

Firstly, "H1: There is a parallel impact between Learning Motivation and Learning outcomes of students' project subjects" is rejected, as the Learning Motivation variable (DC) was excluded from the model.

Secondly, "H2: There is a parallel impact between Consistency in learning and the Learning outcomes of students' project subjects" is rejected due to a P-value of 0.137, which exceeds the 0.05 threshold.

Thirdly, "H3': There is a proportional relationship between the Will to study project subjects and the Learning results of students' project subjects" is accepted, supported by a P-value of 0.000.

Fourthly, "H4: There is a parallel impact between the University's brand name and the Learning results of students' project subjects" is accepted with a P-value of 0.046, which is below 0.05.

Fifthly, "H5: There is a proportional relationship between the Learning method and the Learning results of students' project subjects" is accepted, indicated by a P-value of 0.010, also less than 0.05.

Table 4. Associations in the model SEM analysis outcomes

Hypothesis	Relationship	Weight	S.E.	C.R.	P	Conclusion
H2	KQ <-- KD	.113	.076	1.486	.137	Rejected
H3’	KQ <-- YC	.442	.070	6.341	***	Accepted
H4	KQ <-- TH	.082	.041	1.999	.046	Accepted
H5	KQ <-- PP	.178	.069	2.590	.010	Accepted

Conclusion

Drawing from an extensive review of related literature, this study develops and evaluates a model identifying the factors influencing the Learning results of project subjects following the CDIO framework among students at Vinh University. The findings reveal that the Will to study, University's brand name, and Learning method positively affect the Learning outcomes of CDIO-based project subjects. Conversely, initial variables such as Motivation in learning and Competition in learning did not demonstrate a significant positive association with Learning results. These outcomes have guided the authors in proposing several recommendations aimed at enhancing the academic performance of students in CDIO-oriented project courses at Vinh University:

Firstly, concerning the Will to study, instructors should actively foster and motivate both individual and group commitment to project completion by designing tasks that balance challenge and encouragement, thereby nurturing skills such as teamwork, critical thinking, and practical application, while stimulating student interest.

Secondly, regarding the University's brand name, efforts should concentrate on brand development and reinforcement through advancing the CDIO-aligned curriculum and promoting project-based courses that incorporate collaboration with industry partners, thus building a reputation for delivering high-quality training and producing highly qualified graduates valued by employers and students alike.

Thirdly, for the Learning method, educators are encouraged to employ diverse, active, and interactive teaching approaches that differentiate between traditional, flipped, and participatory learning styles to cultivate critical and creative thinking among students. This strategy necessitates investment in teaching infrastructure—especially online platforms amid ongoing pandemic conditions—and the integration of hybrid teaching models, project-based classes, and practical project designs aligned with students' prospective careers.

Fourthly, the factors Competition in learning and Learning motivation currently lack observable influence on Learning results, suggesting that project assignments may fail to engage students effectively or that assessment methods do not adequately capture individual and group efforts and competitive dynamics. Addressing this issue calls for revising the course outlines, adopting innovative pedagogical strategies, and developing new evaluation techniques that more accurately reflect the CDIO competencies embedded in these project subjects.

Acknowledgments: The authors express their deep gratitude to the leadership of the Economics University, Vinh University, and all participating students for their invaluable support throughout this research and publication process. Special thanks are extended to teacher Quang Bach Tran for his assistance with SPSS and AMOS quantitative analyses.

Conflict of interest: None

Financial support: This research was funded by Vinh University, Vietnam, under the project titled "Research the factors affected to study results of Vinh university students on CDIO approaching project modules" as part of the Student Research Program.

Ethics statement: None

References

1. Thu PT. Evaluation of the influence of factors on the learning positivity of students of the armed police secondary school.
2. Pil L. Training "Active teaching accessment", VVOB in Việt Nam [Internet]. 2011
3. Feldman R. Power learning: strategies for success in college and life. 7th edition, Grawhill publisher. ISBN10: 0077842154; ISBN13: 9780077842154
4. Nguyen MH. Analysis of factors affecting learning outcomes of full-time students at University of Economics, Hue University. Hue University Science Journal, Social Sciences and Humanities. 2020;129(6C). doi:10.26459/hueuni-jssh.v129i6C.5678
5. Kildea AE. Competition: a model for conception. Quest. 1983;35(2):169-81. Available from: https://eric.ed.gov/?id=EJ296037
6. Checchi D. Does educational achievement help to explain income inequality? 2000. doi:10.1093/0199271410.003.0004 Available from: https://www.researchgate.net/publication/5175100_Does_Educational_Achievement_Help_to_Explain_Income_Inequality
7. Aaker DA. Measuring brand equity across products and markets. Calif Manage Rev. 1996;38(3):102-20. doi:10.2307/41165845
8. Balmer JM, Liao M. Student corporate brand identification: an exploratory case study. Corp Commun Int J. 2007;12(3):356-75. doi:10.1108/13563280710832515

9. Tho ND, Trang NTM, Van MLT. The main factors affecting the knowledge received by students majoring in economics in Ho Chi Minh City. Project B2007-76-05, Ministry of Education & Training; 2009.
10. Mushtaq I, Khan SN. Factors affecting students' academic performance. Glob J Manag Bus Res. 2012;12(9):17-22.
11. Phan THT, Nguyen HT, Nguyen TH. Factors affecting student learning results: case study at Banking Academy - Bac Ninh Branch. J Bank Sci Train. 2020;(219).
12. Omeje AN, Abugu SO. The impact of scholarships on students' academic performance: a case of tertiary institutions in Enugu State, Nigeria. Bull Bus Econ. 2015;4(2):93-104.
13. Vo VV. Factors affecting satisfaction with the quality of training services: a study from alumnus of the University of Agriculture and Forestry in Ho Chi Minh City. 2017. Available from: https://www.researchgate.net/publication/324906914_CAC_YEU_TO_ANH_HUONG_DEN_SU_HAI_LONG_VE_CHAT_LUONG_DICH_VU_DAO_TAO_MOT_NGHIEN_CUU_TU_CUU_SINH_VIEN_TRUONG_DAI_HOC_NONG_LAM_TP_HO_CHI_MINH
14. Nguyen TD, Hoang TKO, Le DH. Current situation and factors affecting learning outcomes of students at Faculty of Economics and Business Administration, University of Forestry. J Sci For Sci Technol. 2017.
15. Tahseen NJ, Shaker NS, Hussein ZA, Mutee AF, Al-Tuhafi AM. The effects of Phentermine and Lorcaserin on body weight, food intake, and visceral fat in mice: comparative study. J Adv Pharm Educ Res. 2020;10(1-2020):1-8.
16. Pratama A. Factors affecting students' learning interest in an accounting study programme: a study in Bandung City, West Java, Indonesia. Rev Integr Bus Econ Res. 2017;6(2):295-311.
17. Luu CD, Nguyen TNH, Do NNQ, Vo TMD. Factors affecting students' interest in learning. Industry and Trade magazine. 2021. Available from: https://tapchicongthuong.vn/bai-viet/cac-nhan-to-tac-dong-den-su-hung-thu-in-hoc-tap-cua-sinh-vien-83564.htm
18. Nhac TH, La NBM. Factors affecting the interest in learning foreign languages of Hanoi Law University students. 2018. Available from: https://ngoaingu.hlu.edu.vn/SubNews/Details/16867
19. Jayanthi SV, Balakrishnan S, Ching ALS, Latiff NAA, Nasirudeen AMA. Factors contributing to academic performance of students in a tertiary institution in Singapore. Am J Educ Res. 2014;2(9):752-8.
20. Đinh TH, Hoang TND, Le TKT. Analysis of factors affecting the learning outcomes of students of the economics faculty of Dong Nai University. Sci J Dong Nai Univ. 2018;(11).
21. Alshammari F, Saguban R, Pasay-an E, Altheban A, Al-Shammari L. Factors affecting the academic performance of student nurses: a cross-sectional study. J Nurs Educ Pract. 2017;8(1):60.
22. Ashokkumar P, Giri GVV, Pandya K. Parotid abscess with facial palsy in a patient on hemodialysis: a management challenge. Ann Dent Spec. 2021;9(3):1-4. doi:10.51847/cmrNESOmji
23. Young MR, Klemz BR, Murphy JW. Enhancing learning outcomes: the effects of instructional technology, learning styles, instructional methods, and student behavior. J Mark Educ. 2003;25(2):130-42. doi:10.1177/0273475303254004
24. Le DH. Application of exploratory factor analysis method in determining factors affecting learning outcomes of students of faculty of economics and business administration at Forestry University. J For Sci Technol. 2016;2:142-52.
25. Cole MS, Feild HS, Harris SG. Student learning motivation and psychological hardiness: interactive effects on students' reactions to a management class. Acad Manag Learn Educ. 2017;3(1):64-85. doi:10.5465/amle.2004.12436819
26. Thornton B, Ryckman RM, Gold JA. Competitive orientations and the type A behavior pattern. Psychol. 2011;2(5):411. doi:10.4236/psych.2011.25064
27. Nguyen TTA, Nguyen TNT, Dinh TKO, Nguyen VT. Factors affecting the learning outcomes of third-year students at Can Tho University of Engineering and Technology. J Sci Can Tho Univ. 2016;(46):82-9.
28. Hair JF, Anderson RE, Tatham R, Black W. Multivariate data analysis with readings. Englewood Cliffs (NJ): Prentice Hall; 1998.
29. Kettinger WJ, Lee CC, Lee S. Global measures of information service quality: a cross-national study. Decis Sci. 1995;26(5):569-88.
30. Taylor SA, Sharland A, Cronin JJ, Bullard W. Recreational service quality in the international setting. Int J Serv Ind Manag. 1993;4:68-86.
31. Jabnoun N, Al-Tamimi HAH. Measuring perceived service quality at UAE commercial banks. Int J Qual Reliab Manag. 2003;20:47-55.
32. Anderson JC, Gerbing DW. Structural equation modeling in practice: a review and recommended two-step approach. Psychol Bull. 1988;103(3):411-23. doi:10.1037/0033-2909.103.3.411
33. Nguyen TH, Phung TB, Nguyen KD. Forecasting and data analysis in economics and finance. Ha Noi, Vietnam: Statistical Publisher; 2009.
34. Hair J, Black W, Babin B, Anderson R. Multivariate data analysis. 7th ed. Upper Saddle River (NJ): Prentice-Hall, Inc.; 2010.