Determinants Influencing Accounting Students' Decision to Acquire Big Data Analysis Skills: Evidence from Viet Nam

Hanh Nguyen Thi Thuy
School of Finance and Accounting, Industrial University of Ho Chi Minh City, Ho Chi Minh City, Viet Nam

ABSTRACT*: In Vietnam, the accounting industry rapidly embraces technology, creating a growing demand for professionals skilled in big data analysis. Despite this need, research on this topic in Vietnam remains limited. This study explores the factors influencing accounting students at the Industrial University of Ho Chi Minh City to learn big data analysis skills. Using EFA analysis and a multivariable regression model, the study analysed data from 166 accounting students over one month. The findings reveal that both attitudinal factors and social needs positively impact students' decisions to acquire data analysis skills, while sociocognitive factors have a negative influence. Based on these results, the study suggests policy recommendations for educational institutions and businesses to better support students in developing these essential skills.*

KEYWORDS - *big data analysis, accounting, skills, attitudinal factors, social needs*

I.   INTRODUCTION

Clayton and Clopton (2018) highlight the critical importance of data analytics skills in today's labour market. They argue that current educational resources and textbooks on big data and data analytics are insufficient. To address this gap, they recommend that universities expand their offerings in these areas to prepare students for a data-driven world better. Similarly, Akpeneye (2022) underscores the transformative impact of big data software on the accounting profession. The study found that accountants trained in big data software were better equipped to handle large datasets, significantly enhancing their job performance and opportunities. However, the study's scope was limited to associates from Big Four accounting firms, focusing on the implementation and implications of big data in these settings. The findings illustrate how big data is reshaping the role of accountants, enabling them to perform more sophisticated analyses and make data-driven decisions.

Brink and Stoel (2019) surveyed 342 professionals to identify essential analytical competencies for accounting graduates. Their study concluded that these skills are crucial and should be integrated into accounting curricula to better prepare students for the workforce. Augustine (2020) analysed the content of 35 academic programs and found that only six (about 17%) included courses on Big Data or Analytics for Accountants. The study also revealed a weak correlation (0.228) between program ratings and the inclusion of analytical content, suggesting that top undergraduate accounting programs often neglect big data and analytics. Despite the high interest in these skills within the accounting profession, this enthusiasm has not yet translated into comprehensive curricular changes.

In Vietnam, Nguyen (2020) emphasises the crucial role of "big data" and "data analysis" in various fields, particularly auditing. As large-scale enterprises integrate these techniques, the auditing profession recognises their transformative potential. Her article explores the benefits and challenges of using data analysis and big data in financial statement audits, highlighting their impact on the field. These studies collectively emphasise the growing demand for big data analytics skills in accounting and the need for educational institutions to adapt their curricula accordingly. By incorporating more big data and analytics courses, universities can equip future accountants with the tools they need to excel in an increasingly data-centric industry.

II.   LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT
2.1. Student's Attitude

Fordham (2005) observed that students' attitudes toward big data analysis in accounting have not been given the attention they deserve, even though students themselves recognise its importance. This sentiment is echoed in recent studies by Sarkar et al. (2021), Yang (2020), and Nonis and Hudson (2006). According to Ajzen's (1991) theory of planned behaviour, individuals' intentions to perform a behaviour are heavily influenced by their positive attitudes. In other words, the more favourable an individual's attitude toward a behaviour, the more likely they are to intend to engage in it. Based on this, a research hypothesis is proposed as:

H1(+): Students' attitudes towards big data analysis in accounting have a positive relationship with their decision to learn big data analysis skills.

2.2. Social demands for skilled labour

The Industrial Revolution 4.0 will significantly impact many professions, including accounting. With the rise of AI automation and global outsourcing, the demand for back-office roles is expected to decline. Conversely, there is a growing need for skills related to big data collection and analysis, posing a challenge for accountants. Previous studies by Russom (2011) and Augustine et al. (2020) have shown that social needs are crucial in influencing accounting students' decisions to learn big data analysis skills. Based on this, a research hypothesis is proposed as:

H2(+): The social demand has a positive relationship with the decision to learn big data analysis skills by accounting students.

2.3. External factors

Wang and Wang (2016) highlight that big data has become a leading technology, attracting significant attention from researchers in the accounting field. Advances in artificial intelligence and machine learning, along with the growing capabilities of big data analytics, raise the likelihood that many accounting tasks will be automated. Brynjolfsson and McAfee (2014), Ford (2015), and Osborne and Frey (2017) share this perspective, emphasising the potential for increased computerisation of accounting work. Based on this, a research hypothesis is proposed as:

H3(+): External factors have a positive relationship to the decision to learn big data analysis skills for accounting students.

2. 4. Awareness

Akpeneye's (2022) study found that most new accounting associates consider big data skills crucial for their profession due to the significant value these skills bring. The study also highlights that many individuals recognise the importance of acquiring big data skills as they begin their careers. Additionally, Akpeneye's research reveals that 78% of beginner accounting associates have received prior training in big data, underscoring the growing emphasis on these skills in the accounting field. Based on this, a research hypothesis is proposed as:

H4+: Cognitive factors positively affect accounting students' decision to learn big data analysis skills.

2. 5. Subjective standards

Subjective norms refer to the societal pressures that influence an individual's perception of whether they should perform a specific behaviour based on the expectations of influential people (Ajzen, 2002). These norms reflect the social pressure individuals feel regarding their actions. Previous studies by Cockcroft and Russell (2018), Nguyen (2020), and Bhimani et al. (2018) have confirmed that subjective norms positively impact the intention to learn data analysis skills. Based on this, a research hypothesis is proposed as:

H5(+): Subjective normative factors have a positive relationship with the decision to learn big data analysis skills for accounting students

III.   RESEARCH METHOD AND METHODOLOGY

3.1 The Research Model Development

The study tests the association between six independent variables and the dependent variable QDLC (the decision to learn big data analysis skills for accounting students) based on the following model:

$$QDLC_i = \alpha + \beta_1 TD_i + \beta_2 NCXH_i + \beta_3 YTBN_i + \beta_4 NT_i + \beta_5 CQ_i + \varepsilon,$$

Where

$QDLC_i$ stands for the decision to learn big data analysis skills for accounting students.

- α: constant term
- β_i: coefficient of variables
- ε_i: Residual

The independent variables included TD, NCXH, YTBN, NT, and CQ, which stand for Student Attitudes, Social Demands for skilled labour, External factors, Awareness, and Subjective Standards. They are hypothesised to impact accounting students' decisions to learn big data analysis skills.

Green (1991) recommends that the sample size (N) for multiple regression should be at least $N \geq 50 + 8p$, where p is the number of independent variables. For this study, which included five independent variables, the minimum required sample size was 90. To meet this requirement, 300 questionnaires were distributed to CEOs, CFOs, chief accountants, accountants and accounting students of Vietnamese enterprises and universities. Of these, 166 valid responses were received, resulting in a 55% response rate. The questionnaire used a 5-point Likert scale with options ranging from (1) Strongly Disagree to (5) Strongly Agree. The data was analysed using EFA methods in SPSS 24.0 to examine the research model, theoretical framework, and hypotheses.
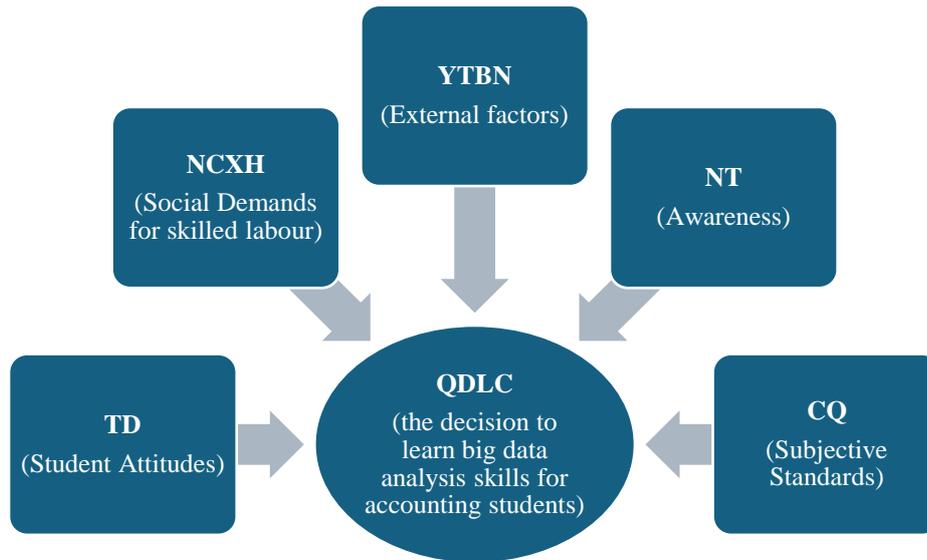
Figure 1: Overview of the research model

This explorative research explores factors that impact accounting students' decisions to learn big data analysis skills in Vietnamese universities. It employs a quantitative survey instrument that collects data using non-probability purposive sampling and snowball techniques.

3.2 Measurements' Development

The questionnaire was designed based on a thorough review of relevant literature and organised into three sections. The first section collected information about the participants, including CEOs, CFOs, chief accountants, accountants, and accounting students from Vietnamese enterprises and universities. The second section gathered data on listed enterprises, and the third section focused on the factors influencing accounting students' decisions to learn big data analysis skills. Before finalising the questionnaire, several scholars and experts in questionnaire development reviewed a preliminary draft. They provided feedback on the wording, content, appropriateness, and coverage of dimensions related to learning big data analysis skills, simplicity, and presentation. After incorporating their feedback, the survey was distributed to the targeted respondents in Vietnamese enterprises and universities. All items related to the model constructs were included in the final questionnaire.

IV.   RESULTS AND DISCUSSION

Using SPSS 24.0 for testing EFA, some research results were found below:

Table 1: The results of the reliability and validity test

Name of Scale	Corrected Item-Total Correlation	Cronbach's Alpha (Number of Observed Variables)
Attitude (TD)	0.726 - 0.803	0.825 (03)
Social needs (NCXH)	0.594 - 0.717	0.754 (03)
External factors (YTBN)	0.726 - 0.803	0.781 (03)
Awareness (NT)	0.726 - 0.803	0.834 (04)
Subjective Standards (CQ)	0.726 - 0.803	0.810 (04)
The decision to learn big data analysis skills for accounting students (QDLC)	0.726 - 0.803	0.891 (05)

In this study, all the scales had values of Cronbach's Alpha more significant than 0.6, ensuring their quality is proper for the study. There are 22 variables in the scales, including 17 independent variables and 05 dependent variables. The test results in Table 2 - KMO and Bartlett's Test show that $0.5 < KMO = 0.731 < 1$, and the Bartlett test was statistically significant with a P-value < 0.05. Thus, applying the EFA model to assess the scale values of the independent variables was proper for this research.

Table 2: KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.731
Bartlett's Test of Sphericity	Approx. Chi-Square	2387.311
	df	105
	Sig.	.000

To ensure the reliability of the five groups of independent variables' factors, a factor analysis test was conducted twice using the 17 observed variables. The results of the analysis are presented in Table 3, which shows the matrix of rotational factors (after excluding three variables, there are 14 variables and merged into three groups):

Table 3: Matrix of rotational factors

Rotated Component Matrix[a]			
	Component		
	1	2	3
TD1	.832		
CQ1	.831		
TD2	.822		
TD3	.808		
CQ3	.794		
CQ2	.791		
NCXH2		.798	
YTBN2		.738	
NCXH1		.722	
NCXH3		.700	
YTBN3		.693	
NT1			.925
NT2			.921
NT3			.648
Extraction Method: Principal Component Analysis.			
Rotation Method: Varimax with Kaiser Normalization. [a]			
a. Rotation converged in 5 iterations.			

The results of the Exploratory Factor Analysis (EFA) on the rotation factor matrix for the independent variables (as shown in Table 3) indicate that all factor loadings of the observed variables are significant, with values exceeding 0.5. The factor analysis comprised three factors aligning with each factor's introductory hypothesis and corresponding measurement variables.

The analytical results in Table 4—Total variance show that the observed variables accounted for a 67.04% (> 50%) variance in the factors. Hence, the EFA model was suitable, prompting the scale's acceptance.

Table 4: Total variance explained

Total Variance Explained									
	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.256	41.705	41.705	6.256	41.705	41.705	4.313	28.752	28.752
2	2.157	14.383	56.088	2.157	14.383	56.088	3.594	23.960	52.713
3	1.643	10.955	67.043	1.643	10.955	67.043	2.150	14.331	67.043
....									
Extraction Method: Principal Component Analysis.									

Table 5 presents a summary of the regression model's results, indicating an adjusted R^2 coefficient of 43.9%. The ANOVA results in Table 6 display a statistically significant valuation, with Sig. < 0.01, we demonstrate the appropriateness of the model and independent variables (NT_2, TD_2 and CNXH_2). Together,

these variables explain 43.9% of the variance in the dependent variable QDLC, while the remaining 57.1% is attributed to factors not accounted for in the model.

Table 5: Summary of the regression model

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.663[a]	.439	.429	.75716	1.862
a. Predictors: (Constant), MEAN_NT_2, MEAN_TD_2, MEAN_NCXH_2					
b. Dependent Variable: MEAN_QDLC					

Table 6: ANOVA results

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	205.412	6	34.235	81.781	.000[b]
	Residual	143.588	343	.419		
	Total	349.000	349			
a. Dependent Variable: REGR factor score 1 for analysis 1						
b. Predictors: (Constant), REGR factor score 6 for analysis 1, REGR factor score 5 for analysis 1, REGR factor score 4 for analysis 1, REGR factor score 3 for analysis 1, REGR factor score 2 for analysis 1, REGR factor score 1 for analysis 1						

Table 7. Regression weighting

Coefficients[a]								
		Unstandardized Coefficients		Standardised Coefficients			Collinearity Statistics	
Model		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	.779	.344		2.263	.025		
	MEAN_TD_2	.312	.073	.304	4.276	.000	.687	1.457
	MEAN_NCXH_2	.486	.078	.443	6.235	.000	.686	1.457
	MEAN_NT_2	.044	.187	.014	.234	.815	.998	1.002
a. Dependent Variable: MEAN_QDLC								

In Table 7 - Regression weighting, the Sig. The value of factor No. 3 (NT_2) is 0.815 > 0.05, so we exclude this factor because it is unreliable in research.
Drawing upon the findings above, it is recommended that the regression equation be articulated in the following manner:
QDLC = 0.304 * TD_2 + 0.443 * NCXH_2.

V.   CONCLUSION

In conclusion, students' attitudes towards big data analysis in accounting positively influence their decision to learn these skills. In addition, the social demand for these skills significantly influences accounting students' decisions to acquire them.

Firstly, factors such as intrinsic interest in the field, student involvement in decision-making processes, positive attitudes towards learning tasks, and practical educational tools all contribute to shaping students' motivation and willingness to acquire new skills in big data analysis within the accounting domain.
Secondly, the increasing relevance of big data in accounting practice, the alignment of academic programs with industry requirements, and the evolving landscape of financial reporting all contribute to the positive relationship between social demand and students' motivation to develop proficiency in big data analysis within the accounting domain.

REFERENCES

[1]. Ajzen, I. (1991). The theory of planned behaviour. *Organisational behaviour and human decision consideration, 50*(2), 179-211.
[2]. Ajzen, I. (2002). Constructing a TPB Questionnaire: Conceptual and Methodological Considerations. *Psychology*, Business.
[3]. Akpeneye, K. (2022). *The Impact of Emerging Big Data and Analytical Approaches.* American: Bryant University Honors Thesis.
[4]. Augustine, F. K., Jr, W., Monica, M. J., & Chambers, V. (2020). Analytics, accounting and big data: Enhancing Accounting. *Journal of Management & Engineering Integration, 13*(1), 1-8.
[5]. Brink, W. D., & Stoel, M. D. (2019). Advances in Accounting Education: Teaching and Curriculum Innovations. *Advances in Accounting Education, 22*, 23-43.
[6]. Brynjolfsson, E., & McAfee, .(2014) .*The Second Machine Age: Work Progress And Prosperity In A Time Of Brilliant Technologies.* New York: WW Norton.
[7]. Clayton, P., & Clopton, J. (2018). Business curriculum redesign: Integrating data analytics. *Journal of Education for Business, 94*(1), 57-63.
[8]. Cockcroft, S., & Russell, M. (2018). *Big Data Opportunities for Accounting and Finance Practice and Research.* Australian: University of Queensland Business School.
[9]. Ford, M. (2015). *Rise of the Robots: Technology and the Threat of a Jobless Future.* New York: Basic Books.
[10]. Fordham, D. R. (2005). New Roles for AIS Courses: A Surprising Finding from a Case Study. *New Roles for AIS Courses: A Surprising Finding from a Case Study, 19(1)*, 113-129.
[11]. Nguyen Thi Thanh Mai. (2020). Application of big data and data analysis in financial statement audit - benefits and challenges for auditing firms. *Journal of Banking Science and Training, 218*, 71-82.
[12]. Nonis, S. A., & Hudson, G. I. (2006). Academic Performance of College Students: Influence of Time Spent Studying and Working. *Journal of Education for Business, 81*, 151-159.
[13]. Osborne, M. A., & Frey, C. B. (2017). The future of employment: how susceptible are jobs to computerisation. *Technological forecasting and social change, 114*, 254-280.
[14]. Russom, P. (2011). *Big Data Analytics.* A publication by the nation center DWI courts.
[15]. Sarkar, S., J. G., Boss, S. R., & Daly, E. (2021). Developing institutional skills for addressing big data: Experiences in implementation of AACSB Standard 5. *Journal of Accounting Education, 54*, 100708.
[16]. Wang, Y., & Wang, Z. (2016). Integrating Data Mining Into Managerial Accounting System: Challenges and Opportunities. *Chinese Business Review, 15*(1), 33-41.
[17]. Yang, W. (2020). Analysis on the influence of big data era on enterprise financial accounting -- a case study of HUA WEI Technologies Co., LTD. *International Conference on Energy Big Data and Low-carbon Development Management (EBLDM 2020), 214*, 6.

*Corresponding Author: **Hanh Nguyen Thi Thuy[1]**
School of Finance and Accounting, Industrial University of Ho Chi Minh City, Ho Chi Minh City, Viet Nam   *nguyenthithuyhanh@iuh.edu.vn*