JBM
The Journal of Business and Management
(B category academic journal as per UGC Nepal classification)

ISSN 2350-8868
Volume IX | Issue 1 | June 2025

Editor-in-Chief

Associate Professor Bharat Ram Dhungana, Ph.D.
School of Business, Faculty of Management Studies
Pokhara University, Pokhara, Nepal
Email: dhunganabharat.pu@gmail.com

Editorial Board Members

Published by

School of Business
Faculty of Management Studies
Pokhara University
Pokhara, Nepal

ISSN 2350-8868
Volume IX | Issue 1 | June 2025

Advisory Board

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List of Authors

Basu Dev Lamichhane, Saraswati Multiple Campus, Tribhuvan University, Kathmandu, Nepal

Bhim Prasad Bhattarai, School of Management, Kathmandu University, Lalitpur, Nepal

Bishnu Prasad Bhattarai, Patan Multiple Campus, Tribhuvan University, Lalitpur, Nepal

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Gyanendra B. S. Johri, Department of Commerce & Business Administration, University of Allahabad, Prayagraj, India

Hitesh Tripathi, School of Management & Commerce, Sanskriti University, Mathura, India

Padam Bahadur Lama, Saraswati Multiple Campus, Tribhuvan University, Kathmandu, Nepal

Pradeep Kumar Srivastava, Department of Commerce & Business Administration, University of Allahabad, Prayagraj, India

Prerna Pandey, Independent Researcher, Kathmandu, Nepal

Saujan Lamichhane, Independent Researcher, Kathmandu, Nepal

Shankar Nath Adhikari, Atlantic International College, Pokhara University, Kathmandu, Nepal

Sharad Srivastava, Department of Commerce, Indira Gandhi National Tribal University, Amarkantak, India

Shiva Raj Poudel, Far Western University, Kanchanpur, Nepal

Siddha Raj Bhatt, School of Management, Kathmandu University, Lalitpur, Nepal

Sudip Wagle, Birendra Multiple Campus, Tribhuvan University, Bharatpur, Nepal

Sweta PC, Independent Researcher, Kathmandu, Nepal

Thakur Prasad Pokharel, School of Engineering of Pokhara University, Pokhara, Nepal

Udaya Kumar Shrestha, Birendra Multiple Campus, Tribhuvan University, Bharatpur, Nepal

JBM
The Journal of Business and Management
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ISSN 2350-8868
Volume IX | Issue 1 | June 2025

RESEARCH PAPERS

JBM
The Journal of Business and Management
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ISSN 2350-8868
Volume IX | Issue 1 | June 2025

Perception of Management Scholars for Course Specialization Decision in Nepal

Basu Dev Lamichhane*, Padam Bahadur Lama*, Prerna Pandey**,
Saujan Lamichhane**, Sweta PC**

*Saraswati Multiple Campus, Tribhuvan University, Kathmandu, Nepal
**Independent Researcher, Kathmandu, Nepal

Received: 24 March 2025
Reviewed: 12 April 2025
Accepted: 5 May 2025
Published: 30 June 2025

Correspondence:
Padam Bahadur Lama
padam.lama@smc.tu.edu.np

Citation:
Lamichhane, B. D., Lama, P. B., Pandey, P., Lamichhane, S., & PC, S. (2025). Perception of management scholars for course specialization decision in Nepal. *The Journal of Business and Management, 9*(1), 1-13. https://doi.org/10.3126/jbm.v9iI.81179

Abstract

Background: The University offers plenty of courses to cultivate academic careers and enhance professionalism among the scholars. Similarly, evolution of modern market with competitive scenario requires competent resources to mitigate diverse challenges. Thus, the adoption of courses by college scholars plays a vital role for driving the future industry and market. Moreover, the course selection decision of college students relies on several dimensions and factors.

Objectives: The main aim of this study is to examine the determinants of students' specialization choices. This study adopted independent variables future prospects (FP), family factors (FF), and market trends (MT), and dependent variables as specialization decisions (SD).

Methods: The research design embraced in the study consists of descriptive, relational, and causal research designs. To assess the relationship of learners' specialization choices, a survey with a structured questionnaire was used to collect the information. A structural questionnaire was distributed among the respondents to give the responses freely. Thus, the study utilized 102 respondents for analysis. This research utilized frequency, mean, median, mode, correlation, and regression analysis for the statistical segment.

Results: The findings of the study revealed a positive and significant influence of prospects on course specialization ($\beta = 0.336$, $p < 0.05$). Similarly, a positive and significant effect of family factors was found on course decisions ($\beta = 0.245$, $p < 0.05$). Finally, results depicted a positive and significant influence of market opportunity trend on course specialization decision ($\beta = 0.337$, $p < 0.05$). Thus, the findings of the study revealed that the future prospect, market trend, and family factors positively link with course specialization decision.

Conclusion: The findings of the study depicted that the course selection decisions of college students are influenced in favorable ways by the future prospect of the course, market trends, and family factors advocating the significant role of family consultation, requirement of market and future prospects.

Keywords: Academic pathway, academic performance, course specialization, student preference

JEL Classification: A22, I20, M10

ISSN 2350-8868
Volume IX | Issue 1 | June 2025

Introduction

The higher level of the educational system offers plenty of opportunities to scholars by offering a tremendous structure of courses to shape their academic and job careers. Thus, embracing the most suitable courses in the higher education system is complex and exerts dilemmas among the learners. Therefore, the selection of a specialization course has become a key concern for students in which consultation of parents, the role of the university, and the market scenario are the key factors for determining the course selection decision. Recent studies have emphasized management scholars' perceptions of the challenges they experience in getting jobs, particularly when market demand shifts (Mainga et al., 2022). Higher educational institutions in Nepal have highlighted the importance of undergraduate employability in response to the needs of the business sector (Szabo, et al., 2020). Similarly, course selection is a significant and critical subject for college students. Students with varying levels of academic proficiency drive job opportunities and long-term professional growth. Thus, the course selection process is directly linked with academic achievement and motivation among students (Babad, et al., 2003).

The major complexity for scholars is to determine and establish a career path. One of the most crucial choices a student will ever make in their life is specialization. Thus, the rationale behind the student's decision to pursue management studies is due to its wide horizon and application. Several factors are responsible for selecting the specialization subjects, including market trends and high job opportunities (Waseem & Zarif, 2012). However, the job market is always expecting skilled and competent human capital, but organizations face a scarcity of resources. Thus, the major challenge was to discover highly competent individuals because higher education specialties were sometimes random among students (Andreea et al., 2013). Parents have an important role in advising students about their specialized options. Students benefit from improved guidance from universities and parents. Students' gender, academic performance, and parent education all influence their choice of specialty (Sarwar & Masood, 2015). Moreover, the predictor's future prospects, family factors, and market trends significantly play a vital role in decision-making for the selection of specialization courses in the higher education system.

Moreover, the huge disparity between the availability of competent human resources and the higher demand of the industrial sector exists in reality, creating complexity in the recruitment mechanism. Next, undergraduate students are increasingly accepting less popular majors thanks to the academic advisor's role and instruction on course content and learning objectives. Misra et al. (2017) stated that less well-liked subjects were experiencing a lack of locally skilled and accessible personnel to satisfy industrial demands. Choosing a major is a significant issue for many industries and academic institutions. Graduate students have a lot of options to study and subsequently work in many areas thanks to the degree of education (Rababah et al., 2017). A person's career path may be influenced by their undergraduate major selection, which can be a complex decision. The intended result of selecting a specialist is the range of professional alternatives. Making decisions about specialization is crucial for their future job fulfillment. Chowdhury and Hossain (2019) claimed that societal factors and prospects have an impact on university-level management and social science students. Selecting the appropriate field of expertise may be a very challenging task, especially when there are many options (Ashraf & Abdullah, 2020).

Shrestha and Shrestha (2021) assert that choosing specialty courses is significantly influenced by prior academic achievement. Once the covariate individual component (previous academic achievement) is controlled for, the influence of the social factor and prospect consideration on specialty selections is negligible. Personal, familial, and professional issues impacted the decisions (Liu et al., 2021). Before attending university, students have some information about their major rather than none at all. The professional aspect is the most important element that influences a student's major decision. Observing this evidence, this study aims to discover the influences of family counseling, market trends, and future

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prospects on academic course selection during university study. Moreover, the discovery of evidence can develop a reliable conclusion based on the Nepalese perspective that can extend support for the selection of specialization decisions.

Review of Literature

Risk Theory

Babad and Tayeb (2003) examined the three factors of course difficulty, lecturer style, and learning value while choosing a course. They came to the conclusion that pupils used to shun hard labor. Easy courses were shown to be strongly preferred by students over challenging ones. Additionally, they discovered that the aspects of lecturer style and learning value were highly valued by students. Feather (1988) discovered evidence to support the theory that students' self-perceptions of their aptitude for mathematics and English influence the courses they choose to take. Kerin et al. (1975) discovered that colleagues were the most essential source of information when selecting courses, followed by personal interest, course substance, and compatibility with the primary subject. This emphasizes the significance of risk theory in understanding student decision-making processes. Students have varying expectations and recognize that these expectations may not be reached. Numerous studies have focused on students' viewpoints, and more research into risk theory and decision making might help students better comprehend their course choices.

Review of Empirical Literature

Waseem and Zarif (2012) investigated Pakistani students' decision to pursue business administration degrees. The study found that students' preferences for management courses were influenced by factors such as the abundance of schools, market trends, and strong employment prospects. The majority chose management studies based on their interests, and the study suggests the government should focus on boosting economic confidence for the next generation. The study by Andreea et al. (2013) examined the factors influencing Romanian students' decision to specialize in higher education. It aimed to understand the challenges of finding highly skilled individuals in Romania. The study found that personal characteristics, economic factors, and corporate climate significantly influence students' decisions (Shrestha et al., 2024). However, most students choose subjects randomly without understanding their career implications, highlighting the need for better understanding.

Sarwar and Masood (2015) the study analyzed factors influencing business graduates' specialization selection, aiming to improve university counseling and competitiveness. Factors such as gender, academic results, and parents' education and professions were identified. The study aimed to understand the reasons behind students' specialization choices and their influence on their decisions. The study found that academic, social, future prospect, human, market demand, and job prospect factors significantly influence the specialization area of business graduates. No relationship was found between father's education, mother's education, occupation, or family income. Career development and personal abilities were the most influential factors.

Mishra et al. (2017) the study investigates factors influencing undergraduate choice of communication majors in Oman, focusing on the demand for public relations over journalism or digital media due to a shortage of locally trained talent. It examines student perceptions of journalism, public relations, and digital media. The findings depicted and discovered that there is a positive attitude of students towards public relations.

Rababah et al. (2017) The study aimed to identify factors influencing students' choice of business administration as a major at Arab Open University. Factors included past achievements, personal interests, job prospects, family members and peers, media, and publicity. Job prospects, family members,

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and media also played significant roles in students' decision-making process. Descriptive and causal research design were used. The research found that parents, friends, and media influence students' major subject choices, with a small sample size of 45 students from AOU's Oman branch. The study was limited to business degree students and focused on personal interests and media influence. The study by Lawati et al. (2017) reveals that Nizwa College of Technology students prefer Human Resources Management and Accounting specializations over Marketing, influenced by factors like self-perception, gender, convenience, and career. However, students lack awareness about marketing specializations.

Chowdhury and Hossain's 2019 study examined the factors influencing business students' perception of specialization selection in Sylhet, Bangladesh, focusing on faculty profile, media, introductory course, referent factors, social media, access to information, and career growth. The study found that faculty members, university content, family, seniority, and friends significantly influence students' choice of specialization and major subject choice. Abdullah and Ashraf (2020) conducted a comparative study on factors influencing the specialization of management and social science students at the university level in Lahore. They identified personal, academic, job opportunities, prospects, and social factors as independent variables, aiming to identify the factors influencing their choice. The study found academic factors significantly influence students' specialization areas in management and social science faculties, with no significant difference between management and science, and no individual reasons for selection.

Shrestha and Shrestha (2021) explored factors influencing management specialization course choices, focusing on future prospects, social factors, and individual factors, including employment opportunities, compensation, and academic performance. The study found that students prepare for future income through specialization courses, influenced by parental, peer, and role model advice, and influenced by academic performance. The study by Liu, Li, Zhu, & Chen (2021) examined the factors influencing the major choice of Nanjing Audit University students in auditing, accounting, and finance. The study found that students at NAU have knowledge about major subjects, with personal, family, and professional factors influencing their specialization selection.

Table 1

Review of empirical studies

Authors	Major Findings
Waseem and Zarif (2012)	Identified that marketing trend did not have significant impact on students' for selecting management science as study option. Observed the students choose subject with personal interest. Found negative and low correlation between selections of management institutes.
Andreea, Liviu, and Alina (2013)	Identified that family and social image influenced students' decision for course selection.
Sarwar and Masood (2015)	Showed no relationship between father's and mother's education with selection of specialization. Found career development and personal abilities of the business graduates were the most influential factors in the selection of specialization.
Mishra, Ismail, and Hadabi (2017)	Observed that there is a significant and positive relationship between selection of major subjects and family advice, and job opportunities. Identified there is a positive attitude of students towards public relation.

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Rababah, Chowdhury, Marzooqi, and Mudhafar (2017)	It Shows that there is no significant relationship between past achievements, job prospects with student's choice of business as major subject. Identified that there is a significant relationship between personal interest, family members, media, and publicity with student's choice of business as major.
Lawati, Kumar, and Subramaniam (2017)	Observed, most of the students suggest juniors choose marketing as their third choice. Identified college orientation has significant influence on student's decision.
Chowdhury and Hossain (2019)	Identified that the choice of specialization was heavily influenced by faculty members and content of the subject offered by the university.
Abdullah and Ashraf (2020)	The economic factors are not associated with the degree gets by students. Identified academic factors influenced the choice of areas of specialization.
Shrestha and Shrestha (2021)	Identified significant effect of social factor, future prospect consideration on specialization choice. Showed significant effect of GPA on selection of course.
Liu, Li, Zhu, and Chen (2021)	Showed students were not completely blind while choosing subject.

The study aimed to identify the relationship between family and professional factors and specialization choice in Kathmandu Valley. It was conducted using a questionnaire with 3-5 options. The study was based on a hypothesis, but it was unable to analyze the impact of specialization choices. Based on the review of literature, the following hypotheses have been developed for the study:

H1: There is a positive effect of future prospect on specialization decisions.

H2: There is a positive effect of market trend on specialization decisions.

H3: There is a positive effect of family factors on specialization decisions.

The study uses a research framework to analyze the relationship between dependent and independent variables, with specialization selection as the dependent variable and future prospect, family factors, and market trends as the dependent variables.

Figure 1

Conceptual framework

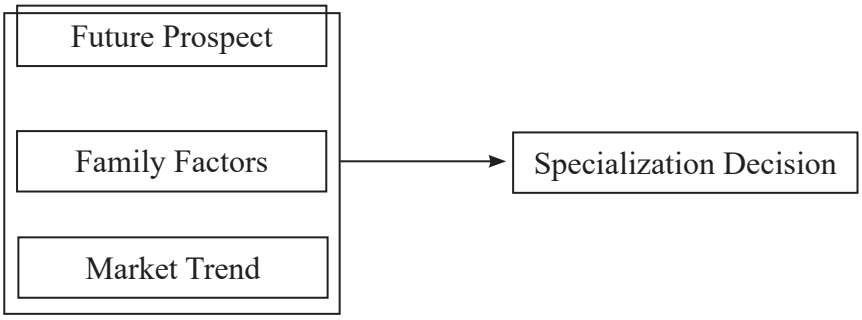

Figure 1 shows the research framework of the study consisting of the future prospect, family factor, market trend and specialization decision as study variables.

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Materials and Methods

The research methodology section describes the actions used to study a research topic and the techniques utilized to comprehend it. It describes the research strategy, population and sample size, type and source of data, variable definitions, analytic methodologies, and the study's limitations. The study employed a quantitative technique to investigate the influence of prospects, family variables, and market trends on specialty selection. Descriptive, casual, and relational research strategies were employed to investigate respondents' beliefs, actions, and characteristics. The 350 structured questionnaires were distributed to target respondents of college students in Kathmandu and received 102 (29.14 percent) useful questionnaires. The study gathered information from respondents using primary data sources such as structured questionnaires. The surveys were classified into two types: classification and research questions. The surveys consisted of Likert scales, multiple choice questions, and single choice questions. The questionnaire was developed to examine future prospects, market trends, and family considerations. The instrument was reliable and valid, based on the findings of the literature research, and it was intended to be completed quickly. The following study model has been formulated:

$SD = \alpha + \beta 1\ FP + \beta 2\ MT + \beta 3\ FF + ei$……(1)

Where,

Y= Specialization Decision

α = Intercept

FP =Future Prospects

MT =Market Trend

FF =Family Factor

Results and Discussion

Descriptive statistics of demographic responses

Table 2

Demographic characteristics of respondents

Gender	**Frequency**	**Percent**
Male	52	51
Female	50	49
Total	**102**	**100**
Education level	**Frequency**	**Percent**
Bachelor level	70	68.6
Master level	32	31.4
Total	**102**	**100**

Table 2 shows the demographic profile of the respondents. The study analyzed 120 respondents, with 52 male and 50 female. The majority 51 percent male were male, while the remaining 49 percent were female. The results showed no equal participation in terms of gender, with a smaller female population. Next, bachelor-level instructors comprised 68.6 percent of all participants, while master-level instructors accounted for percent.

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Table 3

Perspective matching between course decisions and job market

Response	Frequency	Percent
No	30	29.4
Yes	72	70.6
Total	**102**	**100**

Table 3 reveals a significant discrepancy in student perspectives on career choices, with 72 respondents confident that their dream job aligns with their field and 30 believe it doesn't.

Table 4

Introductory course based on aptitude and skill

Response	Frequency	Percent
No	41	40.2
Yes	61	59.8
Total	**102**	**100**

Table 4 shows that out of 102 respondents, 61 students believe the introductory course aligns with their aptitude and skill, while 41 students believe the course does not match their abilities.

Table 5

Parents' encouragement on specialization decision

Response	Frequency	Percent
No	49	48
Yes	53	52
Total	**102**	**100**

Table 5 shows that out of 102 respondents, 53 chose their specialization course through parental encouragement, while 49 were not encouraged by their parents to choose their specialization course.

Table 6

Survey on future prospects

Statement	Rating					Total responses	Weighted value	Weighted mean
	SDA	DA	N	A	SA			
I expect good income and pay increments with time in this specialization	15	25	32	22	8	102	289	2.833
My dream job matches the job of this field.	11	23	37	24	7	102	299	2.931
I think I can improve the skills through studying the course related to my specialization.	6	13	28	28	27	102	363	3.559
Grand mean								9.324

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Table 6 shows the survey on the future prospects of the courses. The majority of respondents believe they can improve their skills through studying courses related to their specialization, with a weighted mean value of 3.559. They also believe their dream job matches the field's job, and they expect a good income and pay increments with time in their specialization. The grand weighted mean value for the independent variable is 9.324.

Table 7

Survey on market trend

Statement	Rating					Total responses	Weighted value	Weighted mean
	SDA	DA	N	A	SA			
I chose this subject as there is less competition and high scope in this field compared to other field.	6	12	35	41	8	102	339	3.324
I think this field polishes my attitude more than any other discipline because of my interest in the field.	3	14	48	31	6	102	329	3.225
I think I can improve my skills through studying the courses related to my specialization.	6	13	28	28	27	102	363	3.559
Grand mean								10.108

Table 7 shows the results of the survey on market trends. The majority of respondents believe that studying courses related to their specialization can improve their skills and polish their attitude more than any other discipline, with a weighted mean value of 3.559. The grand weighted value for the dependent variable is 10.108, indicating a strong positive correlation between the two factors.

Table 8

Survey on family factors

Statement	Rating					Total responses	Weighted value	Weighted mean
	SDA	DA	N	A	SA			
My family members influenced me to choose a course.	15	23	29	29	6	102	294	2.882
My family provides me with emotional support to choose my course.	4	15	38	37	8	102	336	3.294
I can study the course that my family can afford.	4	13	34	35	16	102	352	3.451
Grand mean								9.627

Table 8 shows the findings of a survey on family factors for specialization course decision. The majority of respondents agree that they can afford a course, with a weighted mean value of 3.451. They also believe their family provides emotional support and influences them to choose the course, with a weighted mean value of 3.294. The grand weighted value for the dependent variable is 9.627.

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Table 9

Survey on specialization decision

Statement	Rating					Total responses	Weighted value	Weighted mean
	SDA	DA	N	A	SA			
I am satisfied with my preference of my major.	7	14	30	42	9	102	338	3.314
I will change my major if I don't find it interesting.	4	9	47	31	11	102	342	3.353
I could have chosen a different major if I were informed well about other majors in the first year.	4	27	26	36	9	102	325	3.186
Grand mean								9.853

Table 9 shows the results of a survey on specialization decisions. It shows that the majority of the respondents agreed with the statement I will change my major if I don't find it interesting with a weighted mean of 3.353. Similarly, another statement I am satisfied with my preference of my major with a weighted mean of 3.314. The statement I could have chosen a different major if I had been informed well about other majors in the first year with the weighted mean of 3.186. And the grand weighted mean value for the dependent variable is found to be 9.853.

Table 10

Descriptive statics for all samples

Variables/statistics	N	Mean	Std. Deviation	Variance
Future Prospects	102	3.0556	0.75355	0.568
Market trend		3.3693	0.69874	0.488
Family factors		3.2092	0.69877	0.488
Specialization of choice		3.2843	0.56754	0.322

Table 10 presents the descriptive statistics of the variables under study, including mean, median mode, standard deviation, and variance for all sample respondents. The independent variable, market trend, had the highest mean of 3.366, followed by future prospect at 3.0556, family factor at 3.2092, and specialization at 3.2843.

Table 11

Correlation analysis

Variables	Specialization Decision
Future Prospect	.446**
Market Trend	.301**
Family Factor	.414**

** Correlation is significant at the 0.01 level (2-tailed).

Table 11 shows the correlation results. The study found a positive correlation between future prospects and specialization of choice, with a significant correlation at the 0.01 level (2-tailed), indicating a positive relationship between these variables. Moreover, the study reveals a positive correlation between

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market trends and specialization of choice, as shown in the result. Finally, the study reveals a positive correlation between family factors and specialization of choice.

Table 12

Regression coefficient

Variables	Intercept	Unstandardized Coefficients	Standardized Coefficients		t	Sig.	F	Adj. R_Sq	SEE
		B	Std. Error	Beta					
FP	2.257	0.336	.067	.446	4.987	0.0	24.872	0.191	0.51042
MT	2.46	0.245	0.077	0.301	3.16	0.00	9.986	0.082	0.54387
FF	2.204	0.337	0.074	0.414	4.554	0.00	20.741	0.163	0.51908

a. Dependent Variable: specialization of choice

Note: FP = Future prospect, MT = Market trends, FF = Family factor, and SD = Specialization decision

Table 12 reveals a significant positive effect of future prospects on specialization choice, with shopping future prospects as independent and specialization choice as dependent. The coefficient with 0.336 indicates that an increase in future prospects leads to an increase in specialization choice at a 99% confidence level. Moreover, a significant positive effect of market trends on specialization choice, with market trends being independent and specialization choice dependent. The effect is positive and significant at a 99% confidence level, with a coefficient of 0.245 indicating that an increase in market trends leads to an increase in specialization choice. Finally, the study reveals a significant positive effect of family factors on specialization choice, with family factors acting as independent variables and specialization choices as dependent ones. The market trend also positively influences specialization choice, with a coefficient of 0.337 indicating an increase in family factors.

Table 13

Summary of hypotheses

Hypothesis	Results
H1: There is a positive effect of future prospect on specialization decision	Accepted
H2: There is a positive effect of market trend on specialization decision	Accepted
H3: There is a positive effect of family factors on specialization decision	Accepted

Table 13 shows the summary of the hypotheses. Hypothesis H1: There is a positive effect of future prospects on specialization decision was accepted as the study found significant. Next, the second hypothesis H2: There is a positive effect of market trend on specialization decision was also accepted. Finally, H3: There is a positive effect of family factors on specialization decision was also accepted.

Conclusion and Suggestions

The objective of the study was to assess the factors influencing prospects, market trends, and family suggestions on the specialization decisions of scholars. This study adopted descriptive, correlational, and causal research designs, and the primary data was used for the analysis, in order to assess the differences, investigate the relationship, and analyze the role of the independent variables: prospects, market trend, family factor, and the dependent variable on specialization choice among the students in the Kathmandu Valley. The data was collected through the structured questionnaire that was personally administered to the respondents of Kathmandu Valley. The study was conducted in 102 respondents constituted the sample size. In this study, data was evaluated using mean, median, mode, standard deviation, variance,

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and correlation and regression analysis.

The link between specialization and its drivers as a prospect, market trend, and family factors was revealed. This can be concluded that the selection decision of specialized courses of scholars is influenced by several factors in which academic institutions should concentrate while offering academic courses. Moreover, it was found that the choice of specialization is positively and significantly correlated with market trends, prospects, and family factors. The overall fit of the linear regression model is evident from the test results. It demonstrates that, on one level of significance, the influence of family, prospects, and market trends is substantial. The study's goal was to have a better understanding of the best strategy to choose a specialism.

The decision to specialize is influenced by several variables. The main factors influencing the decision to specialize are the subject of this study. It is imperative that students assess every factor that influences their choice of specialization, whether directly or indirectly. The findings of this study will have significant ramifications and are thought to be beneficial for students, college students, etc. Understanding their children's priorities in the specialization course selection can help parents and students make decisions on their specializations. As a result, future research can include additional factors, longitudinal studies, larger sample sizes, and more leading variables that span various geographic locations.

Author contribution statement

Basu Dev Lamichhane: Conceptualization, methodology, data analysis and writing; **Padam Bahadur Lama:** Conceptualization, methodology, data analysis and writing; **Prerna Pandey:** Conceptualization, methodology, data analysis and writing; **Saujan Lamichhane:** Conceptualization, methodology, data analysis and writing; **Sweta PC:** Data collection. All author(s) involved in addressing the comments, revision of the paper and finalization of manuscript.

Funding

There is no funding support for this study.

Declaration statement

The authors declare no conflict of interest.

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JBM
The Journal of Business and Management
(B category academic journal as per UGC Nepal classification)

ISSN 2350-8868
Volume IX | Issue 1 | June 2025

Behavioral Intentions Toward Cryptocurrency Transactions: Exploring Through Snowball Sampling Among Users

Bhim Prasad Bhattarai*

*School of Management, Kathmandu University, Lalitpur, Nepal

Received: 16 March 2025
Reviewed: 24 April 2025
Accepted: 15 May 2025
Published: 30 June 2025

Correspondence:
Bhim Prasad Bhattarai
24622_bhim@kusom.edu.np

Citation:
Bhattarai, B.P. (2025). Behavioral intentions toward cryptocurrency transactions: Exploring through snowball sampling among users. *The Journal of Business and Management, 9*(1), 14-29. https://doi.org/10.3126/jbm.v9iI.81181

Abstract

Background: Cryptocurrency is a digital decentralized currency that enables peer-to-peer transactions without the involvement of intermediaries, using blockchain technology to ensure security and transparency. These emotions can help understand when and what behavioral intentions toward cryptocurrency adoption are necessary. These insights contribute to the growing literature on fintech adoption in emerging economies and provide valuable guidance for policymakers and investors formulating cryptocurrency regulations in Nepal.

Objectives: It aims to investigate the influence of perceived usefulness, perceived ease of use, trust, and perceived risk constructs attached to an individual's intention to be involved in cryptocurrency transactions. It finally aims to study the relationships among these variables and their effect on cryptocurrency adoption in the Nepal context.

Methods: The study uses a quantitative descriptive design and snowball sampling alone to extract information from cryptocurrency users in Nepal. A structured online questionnaire was used to gather 272 responses and analyzed using correlation and regression to investigate the significance of the proposed hypotheses.

Results: Findings show that perceived usefulness, ease, or trust significantly and positively influence behavioral intention toward cryptocurrency adoption, while perceived risk harms adoption because users worry about market volatility, regulatory uncertainty, and security threats. Despite the government's legal restrictions, many Nepalese citizens are still involved in cryptocurrency transactions, seeing it as a source of financial benefit and investment opportunity.

Conclusion: The study attests that perceived usefulness, perceived ease of use, and trust motivate behavior toward adopting cryptocurrency, while perceived risk provides a barrier. This enlightens policymakers on balanced regulatory measures that address risks while encouraging innovation in digital finance. These findings would provide valuable implications for policymakers, financial institutions, and technology developers in outlining the future of cryptocurrency regulation and adoption strategies.

Keywords: Behavioral intention, cryptocurrency, perceived usefulness, trust, perceived risk

JEL Classification: D14, E42, G41

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Introduction

The fast development of financial technology has largely transformed the world's financial landscape, with cryptocurrencies being a disruptive innovation. Cryptocurrencies such as Bitcoin and Ethereum use decentralized blockchain technology, thereby doing away with the use of intermediaries such as banks and financial institutions (Nakamoto, 2008). Cryptocurrencies have increasingly become popular since their introduction, owing to their anticipated advantages, which are lower transaction costs, improved security, as well as anonymity. But the use of cryptocurrencies varies significantly in different parts of the world, depending primarily on regulatory environments, levels of technological awareness, and perceived risk (Böhme et al., 2015). The current study investigates users' behavioral inclinations regarding cryptocurrency transactions, with specific reference to the context of Nepal, where user attitudes and regulatory hurdles are key determinants.

The history of cryptocurrency can be traced to the year 2009 when Bitcoin, a decentralized peer-to-peer payment network (Nakamoto, 2008), was introduced. In comparison to conventional banking systems, cryptocurrency transactions are processed using blockchain technology, which makes them transparent, secure, and immutable (Antonopoulos, 2017). Whereas electronic payment systems enabled by conventional financial institutions tend to have intermediaries, cryptocurrencies provide a cheaper and more inclusive alternative that eliminates intermediaries (Fauzi et al., 2020). But the fluctuation in the price of cryptocurrencies, security concerns, and the possibility of illicit activities have prompted skepticism and regulatory actions in most nations, including Nepal (Houben & Snyers, 2018).

In Nepal, cryptocurrency transactions are prohibited under the Foreign Exchange Regulation Act (2019), classifying them as illegal financial instruments. Despite such legal restrictions, the number of people in Nepal getting involved in cryptocurrency transactions is growing, indicating a gap between regulatory systems and user activities (Nepal Rastra Bank, 2021). The prevailing regulatory ambiguity poses immense challenges to investors, policymakers, and financial institutions in ascertaining the legality and way forward of cryptocurrencies within the nation. Moreover, the absence of tools meant for consumer protection, as well as a lack of knowledge about the risks associated with cryptocurrencies, increases their adoption (Kshetri, 2021). Explaining the behavioral intentions of cryptocurrency transactions entails examining key psychological and technological variables that shape user decision-making behavior. The Technology Acceptance Model (TAM) posits that perceived usefulness and ease of use are important predictors of technology adoption (Davis, 1989). Specifically, users will adopt digital currencies when they find them easy to use and useful for enabling financial transactions (Venkatesh et al., 2003). Further, trust and perceived risk play an incredible role in the rates of adoption. Based on studies, individuals with greater trust in blockchain technology and less perceived risk are more likely to use cryptocurrencies (Gefen et al., 2003).

Although numerous studies have concentrated on the adoption of cryptocurrencies in developed economies, studies targeting emerging economies like Nepal are scarce. Existing studies have also centered primarily on technological and regulatory dimensions, with less attention to consumer attitudes and behavioral drivers that affect cryptocurrency adoption (Folkinshteyn & Lennon, 2016). The purpose of this research is to fill the existing gap by examining the behavioral intentions of the users of cryptocurrencies in Nepal, thereby offering information that can assist policymakers, financial institutions, and technology developers in making future adoption strategies and regulations.

In Nepal, cryptocurrency usage is presently categorized as illegal pursuant to the Foreign Exchange Regulation Act of 2019 that imposes a ban on foreign currency along with non-sovereign digital asset-based transactions. There have been various advisories issued by the Nepal Rastra Bank to strengthen this ban (Dhungana, 2022). Notwithstanding the prevailing regulatory approach, cryptocurrencies continue to gain appeal among Nepali people, particularly young and technologically literate citizens. A large

number of them are actively involved in peer-to-peer transactions and investment through decentralized platforms (Paudel & Baral, 2023). Such a paradoxical situation invites some pertinent questions: why would individuals use a financial instrument without legal status, and why would they want to circumvent traditional banking channels for interaction with crypto-assets? Research undertaken at an international scale has identified that behavioral aspects, including perceived usefulness and ease of use, are significant determinants of individuals' intention to use cryptocurrencies (Arias-Oliva et al., 2019). Furthermore, trust in the system and the technology underpinning it is critical in influencing individuals' decisions to invest or make payments using cryptocurrencies, particularly in settings where there is limited regulatory clarity (Alqaralleh et al., 2021).

In the Nepalese context, where there are legal restrictions coupled with growing popular interest, the issue is whether users see these risks and whether trust and perceived utility overcome the challenges. This study attempts to investigate such behavioral dynamics through the following research questions: (1) Do perceived ease of use and perceived usefulness influence users' intentions to use cryptocurrency? (2) Does perceived risk have an impact on investment in cryptocurrency? (3) Does trust have a strong relationship with behavioral intentions towards cryptocurrency?

This study will evaluate the attitudes of the public regarding cryptocurrency adoption in Nepal's illicit environment, with three primary objectives. First, it will establish the position of behavioral intentions of Nepalese users towards cryptocurrency transactions, addressing a significant gap in the literature of emerging economies (Kshetri, 2021). Second, extending the Technology Acceptance Model (Davis, 1989), this research explores the influence of perceived usefulness (PU) and perceived ease of use (PEU) on informing adoption choices in a setting with legal limitations (Folkinshteyn & Lennon, 2016). Furthermore, it looks at the dual function of trust (T) in blockchain networks (Gefen et al., 2003) and perceived risk (PR) under market fluctuation and regulation uncertainty (Xie, 2022) in influencing users' behavior. By exploring such interconnected drivers through snowball sampling - a necessity owing to Nepal's crypto ban (Nepal Rastra Bank, 2021) - the study provides evidence-based recommendations for developing holistic regulatory frameworks in light of both technological potential and financial issues.

The global advancement of cryptocurrency has had a contradictory impact in Nepal, where they are prohibited in the Foreign Exchange Regulation Act (Nepal Rastra Bank, 2019), yet it is gaining massive traction. While various other countries have begun adopting cryptocurrency as money and an asset in the world of the web (International Monetary Fund, 2023), Nepal's tradition-oriented approach has created a unique platform where its users are at a state of legal ambiguity. This study stems from interrogating questions regarding this paradox: Why are Nepalese citizens still adopting cryptocurrency despite legal prohibition? Could regulated integration improve individual economic status and national income (World Bank, 2022)? The study is particularly urgent given the democratizing potential of cryptocurrency in a nation where 45% of adults remain unbanked (Asian Development Bank, 2023). Through examining socio-economic reasons for taking up crypto - e.g., work for cerebral returns rather than usual labor (Tapscott, 2022) - this study provides essential data for policymakers to weigh whether current bans are effective, or whether a controlled strategy may be able to harness the potential of crypto with less risk (Gurung et al., 2023). The findings will inform existing global debates about how best to harmonize financial innovation with consumer protection in emerging markets.

Review of Literature

A comprehensive review of the literature is crucial in understanding the behavioral intentions that are manifested by cryptocurrency users and the determinants that drive their adoption. This chapter provides a conceptual framework, presents empirical evidence, and establishes gaps in the literature that warrant the undertaking of this research.

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The Technology Acceptance Model (TAM), created by Davis in 1989, explains that there are two significant determinants of technology adoption: perceived usefulness (PU) and perceived ease of use (PEU). PU is the individual's perception that using a technology will enhance his or her performance or bring substantial advantages, whereas PEU is the degree to which he or she perceives the technology as being easy to use. There have been various attempts to apply TAM in cryptocurrency, with studies showing that people are more likely to use digital currencies if they perceive them as useful and easy to use (Kim, 2017).

Building on the Technology Acceptance Model (TAM), Venkatesh et al. (2003) constructed the Unified Theory of Acceptance and Use of Technology (UTAUT), integrating other variables like social influence and facilitating conditions. Social influence describes the degree to which individuals perceive that others expect them to use technology, whereas facilitating conditions describe the external resources and infrastructure conducive to adoption. Both social and regulatory contexts are found to have a significant impact on cryptocurrency adoption (Gupta, 2022).

Featherman and Pavlou (2003) described various kinds of perceived risks, such as financial, security, and legal risks, all of which are especially relevant in the context of cryptocurrency transactions. Because of the intrinsic volatility, decentralization, and prevalent lack of regulation in most areas, investment loss concerns, scams, and regulatory fines have a strong influence on user adoption (Xie, 2022).

Gefen et al. (2003) suggested that technology trust, service trust, and transaction security influence adoption decisions. For cryptocurrency, trust is associated with blockchain security, exchange websites, and government oversight (Humayun & Belk, 2024). Individuals will engage in digital cash if they find the system transparent, secure, and free from manipulation (Krombholz, 2021).

Folkinshteyn and Lennon (2016) discovered that most individuals take up cryptocurrency mainly for investment potential and financial freedom, but are deterred by security concerns and legal uncertainty as significant barriers. Kim (2017) demonstrated that perceived usefulness plays a fundamental role in the adoption of cryptocurrency, particularly in areas with poor access to conventional banking services. Mazambani and Mutambara (2019) noted that perceived ease of use is a key determinant because cumbersome platforms discourage novice users from participating in cryptocurrency transactions. Humayun and Belk (2024) emphasized that blockchain technology and crypto exchange trust are essential adoption drivers. (Krombholz, 2021) surveyed 1,775 Bitcoin users and stated that although the majority of users have trust in the security of the blockchain, there are still vulnerabilities on exchange sites and hacking activity issues. Xie (2022) juxtaposed regulations in China and the USA of cryptocurrencies and concluded that regulatory uncertainty significantly increases perceived risk and causes discouragement of adoption. Gupta (2022) studied the adoption of cryptocurrency in India, where there are regulatory ambiguities, and established that the majority of users continue to be active in cryptocurrency despite hazards, driven by prospective earnings. Sas and Khairuddin (2016) clarified that early adopters of cryptocurrency value financial autonomy and decentralization, yet price fluctuations and lack of consumer protection hinder widespread adoption. The Nepal Rastra Bank (2021) has explicitly banned cryptocurrency transactions; however, the illicit trade is ongoing via peer-to-peer (P2P) platforms, which reflects the presence of an unsafe and unregulated black market.

These works demonstrate that while the adoption of cryptocurrency is led by perceived benefits and technological ease, trust and risk considerations remain crucial. However, there has been scant research on Nepalese users, particularly in an environment where cryptocurrency is prohibited by law.

Despite extensive studies on cryptocurrency adoption worldwide, there remain some research gaps that this research attempts to bridge. Lack of sufficient studies on the users of cryptocurrency in Nepal. Most studies have touched on cryptocurrency adoption among countries where cryptocurrencies are

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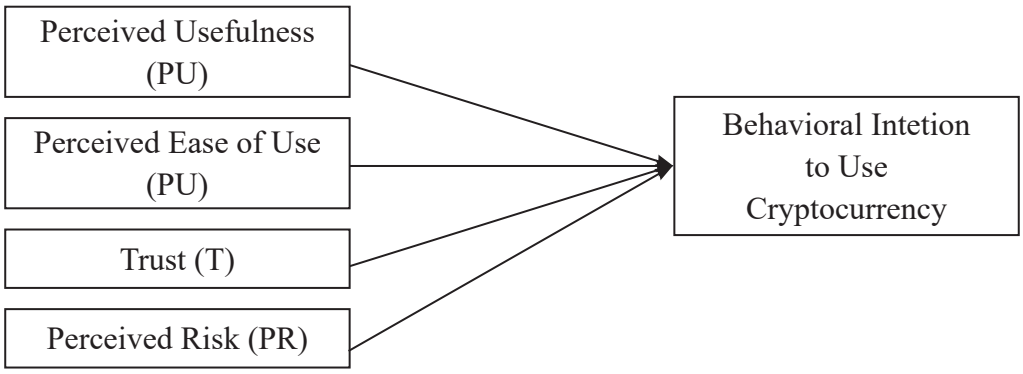
either legal or at least partially regulated. Cryptocurrency trading is strictly forbidden in Nepal, thereby presenting a unique adoption scenario that has been less studied. There is a scarcity of research that employs snowball sampling. Most of the existing studies have utilized random or convenience sampling, usually in environments where cryptocurrency trading is prevalent. Given the clandestine nature of Nepal's cryptocurrency market, snowball sampling is a better approach to access genuine users. Limited integration of risk and trust considerations in legal limitation markets, as numerous studies have tested perceived ease of use and perceived usefulness, but few have addressed the relationship between trust, perceived risk, and adoption in legally constrained contexts. The analysis of how Nepalese users view these aspects can provide fresh insight into trends in cryptocurrency adoption. By examining these limitations, this research provides novel evidence on the behavioral intentions of Nepalese crypto-users, thereby contributing to the wider literature on digital financial technologies in constrained economies.

Theoretical Framework in Cryptocurrency Adoption

Various theoretical models account for the adoption of cryptocurrencies; for example, the Technology Acceptance Model (TAM) is based on the notions of perceived usefulness (PU) and perceived ease of use (PEU) (Davis, 1989). Trust and social influence were therefore added to it by the contemporaries: Venkatesh et al. (2003). Further on, that is, in the immediate past, as cited by Venkatesh et al. (2012), the introduction of effort expectancy and the facilitating conditions into the Unified Theory of Acceptance and Use of Technology (UTAUT) emerged. One of the ground-breaking theories of adoption is the Diffusion of Innovations (DOI), which considers early adopters to be influential (Rogers, 2003). Finally, it is possible to view the adoption intent through the Theory of Planned Behavior (TPB). Here, the argument is that the three components of attitude, subjective norm, and perceived behavioral control can predict the intention to adopt (Ajzen, 1991).



Behavioral Intention to Use Cryptocurrency

The perception of trust and risk, usefulness, and ease of use influence users' behavioral intentions toward cryptocurrency adoption or rejection for transactions. Perceived usefulness is a perception that cryptocurrency would help users financially by keeping transaction costs low and providing global access (Davis, 1989). Perceived ease of use plays an equally important role in determining whether the users consider cryptocurrency a convenient way to do transactions or whether they associate it with difficulty-thereby affecting adoption (Venkatesh & Davis, 2000). It is, however, trust that bridges these two behavioral constructs; trust in blockchain security and trust in platform reliability foster usage (Gefen et al., 2003). These models face contextual limitations. While TAM (Davis, 1989) effectively explains individual adoption in open markets, Nepal's legal prohibition creates unique systemic barriers (Shrestha & Dhakal, 2023). Similarly, UTAUT's 'facilitating conditions' (Venkatesh et al., 2003) assume institutional support—a mismatch with Nepal's criminalized environment, where users rely on peer networks (Khatiwada et al., 2023). This study adapts these frameworks by incorporating prohibited-

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context moderators. In contrast, perceived risk is an opposing force negatively impacting behavior due to risks of volatility, fraud, and regulatory uncertainties (Featherman & Pavlou, 2003). Despite legal restrictions in Nepal on the use of cryptocurrency, a large group remains to weigh its benefits versus the risks (Folkinshteyn & Lennon, 2016). These sets of factors are therefore essential to give an insight into the forecasts on adoption and factors that influence regulation in the future.

Perceived Usefulness (PU)

Perceived usefulness refers to the degree to which a user believes that using a particular technology enhances their performance. Research shows that users adopt cryptocurrencies due to their ability to facilitate low-cost, borderless transactions (Fauzi et al., 2020). Studies by Kshetri (2021) indicate that cryptocurrency adoption is driven by its potential to provide financial inclusion in unbanked regions. Furthermore, recent studies highlight that the adoption of cryptocurrency in e-commerce and cross-border remittances is increasing due to its speed and cost-effectiveness (Gomber et al., 2018).

H1: *There is a significant relationship between the perceived usefulness and intentions of users toward cryptocurrency.*

Perceived Ease of Use (PEU)

The perceived ease of use relates to the level of effort to use cryptocurrency. More user-friendly interfaces and simplified transaction processing favorably influence adoption rates (Gefen et al., 2003). However, research shows the technicalities remain a hindrance for novice users (Folkinshteyn & Lennon, 2016). The research also shows that a lack of educational resources and technical support can inhibit new users from using cryptocurrency platforms (Mallat, 2007). To overcome these obstacles, developers of cryptocurrencies have begun implementing mobile-friendly apps with simpler user experiences to better enhance accessibility.

H2: *There is a significant relationship between Perceived Ease of Use and the intention of users toward cryptocurrency.*

Trust (T)

The adoption of cryptocurrencies is heavily reliant on trust in terms of security, fraud, and undefined regulatory criteria (Houben & Snyers, 2018). Those who trust the technology of blockchain and decentralized finance processes are likely to be more willing to trade in cryptocurrencies (Gefen et al., 2003). According to research (Nakamoto, 2008), the transparency and immutability of the blockchains increase user confidence. Lastly, trust is molded also by media coverage and governmental attitudes toward cryptocurrency regulation affecting public perception (Lustig & Nardi, 2015). Studies believe that an institutional adoption of blockchain technology could serve to create greater trust and wider acceptance (Walch, 2017).

H3: *There is a significant relationship between Trust and the intention of users toward cryptocurrency.*

Perceived Risk (PR)

Risk as perceived is defined as the likelihood of a negative event that, among other things, threatens security for the user, with price volatility and legal uncertainty following close behind (Kim, 2018). Empirical evidence, on the other hand, states that adoption intent is negatively affected by high levels of perceived risk (Kshetri, 2021). Furthermore, some studies point out, for example, that a lack of insurance cover for cryptocurrency investments and hacking incidents serve to amplify risks in the minds of potential investors (Böhme et al., 2015). Then again, some investors are willing to adopt cryptocurrencies due to their high return potential and the diversification benefits they offer in the investors' portfolios (Corbet et al., 2019).

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H4: There is a significant relationship between Perceived Risk and the intention of users toward cryptocurrency.

It can be gathered from the literature that perceived usefulness, ease of use, trust, and perceived risk are some of the critical factors influencing the adoption of cryptocurrencies. Though blockchain technology promises security and efficiency, regulatory challenges and security issues have been critical determinants of adoption trends. The current study endeavors to empirically test the above hypotheses in the context of Nepal, thus providing some insights for policymakers and financial institutions. Future studies should assess regulatory clarity, technological updates, and demographics as other evaluating factors for cryptocurrency adoption

Materials and Methods

The methods used to carry out this study on behavioral intention toward cryptocurrency transactions in Nepal. The research design, sources of data, procedures for data collection, sampling techniques, research instrumentation, and procedures for data analysis are discussed. While keeping in view the legal restrictions on cryptocurrency transactions in Nepal, this study uses a descriptive research design to explore user perceptions and behaviors in an unregulated financial environment.

Research Design

The descriptive research design is used to study the behavioral intentions of Nepalese cryptocurrency users. It consisted of a survey method through a structured questionnaire to measure key variables like perceived usefulness, ease of use, trust, and perceived risk. To maintain anonymity and accessibility, the online questionnaire was used via Google Forms. A total of 272 responses were received from people with prior experience in cryptocurrency transactions. Given the illegal nature of cryptocurrency transactions in Nepal (Nepal Rastra Bank, 2021), a non-probability sampling technique was applied in snowball sampling where respondents are reached through referrals. This allowed access to participants who were trading in cryptocurrency while maintaining confidentiality.

Population and Sample

As individuals residing in Nepal with experience in using cryptocurrency for trading, investing, or digital transactions, this study's targeted population involves 272 respondents who have been sampled through snowball sampling and are involved in cryptocurrency transaction activities. The approximate total population of cryptocurrency users in Nepal is currently unknown, due to the absence of official data or registry, as the Nepal Rastra Bank prohibits cryptocurrency transactions. However, estimates suggest a growing underground community, particularly among youths and digital entrepreneurs (Dhungana, 2022). Users are identified through referrals within cryptocurrency communities and online groups.

Nature and Sources of Data

The study mainly relies on the primary data in the form of a structured close-ended questionnaire and data sources have also been consulted to enhance the validity of the study, including Cryptocurrency-related research articles and journals, Coin Market Cap and security token databases, Blockchain and crypto-wallet transaction records, and Regulatory guidelines from Nepal Rastra Bank (NRB, 2021)

Sampling Method

Due to the legal constraints on cryptocurrency transactions, it was found that the non-probability sampling technique was preferable in Nepal. Snowball sampling was the most suitable method of involving respondents, whereby they referred other users of cryptocurrency in their network to participate. This was needed since the peer-to-peer and encrypted online groups are exposing the cryptocurrency traders in Nepal to operate discreetly. Concerning access to the research study, it can also be said that

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it is quantitative and that data was collected through the use of questionnaires that were given to the respondents in the survey for purposes of identification.

Data Collection Procedure

Data collection was conducted exclusively online to ensure participant anonymity and security. The structured questionnaire was distributed via Encrypted email referrals, Cryptocurrency discussion forums, and Private online messenger groups (Telegram, WhatsApp, TikTok, Instagram, LinkedIn). All 272 participants had direct experience in cryptocurrency trading, blockchain transactions, or digital asset management. Responses were collected over three months, ensuring sufficient sample representation.

Data Analysis

It was analyzed using statistical quantitative methods. Demographic analysis analyzed respondents based on age, sex, family type, profession, monthly income, and marital status as factors in exposure to cryptocurrencies. Correlation analysis looks at the interaction among dependent and independent variables, while regression and ANOVA analysis test for influence. Data processing and hypothesis testing were done using SPSS and Excel.

Reliability and Validity

Validity and reliability of the survey questionnaire were ensured through a systematic process. Internal consistency was established using Cronbach's alpha, with all constructs meeting the minimum threshold of 0.70, indicating reliable measurement (Hair et al., 2019). For content validity, the questionnaire was expert-checked by industry and academic experts, and it was ensured that the items accurately represented the conceptual framework of the study.

Results and Discussion

This section presents the data analysis of the study's conclusion. Demographic details and content analysis are presented here.

Table 1

Demographic Profile of Respondents

Demographic variable	Classification	Frequency	Percentage
Family Type	Nuclear	188	69.1
	Joint	84	30.9
Monthly Income	Below 25000	72	26.5
	25000-50000	64	23.5
	50000-75000	106	39.0
	75000 above	30	11.0
Gender	Female	110	40.4
	Male	162	59.6
Marital Status	Married	242	89.0
	Unmarried	30	11.0
Occupation	Business	72	26.5
	Employee	64	23.5
	Self-Employee	106	39.0
	Student	30	11.0

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Note: Online survey data collection by snowball sampling.

Table 1, 69.1% of respondents belong to nuclear families, while 30.9% belong to joint families, therefore, nuclear family individuals are believed to exercise financial autonomy in cryptocurrency acceptance. In income brackets, 39.0% are between NPR 50,000-75,000 incomes, which makes them the largest group of cryptocurrency users, while 26.5% earn below NPR 25,000. This shows that the middle-income group is more into cryptocurrency investments. Gender-wise, 59.6% are male and 40.4% female, indicating greater male participation, though female participation is commendable. In terms of marital status, it is hinted that 89.0% of users are married, whereby the adoption may be driven by long-term financial planning. Data on occupation reveals that 39.0% there to be self-employed, with preference given to business owners at 26.5%, and employees at 23.5%, which suggests that entrepreneurs and professionals view cryptocurrencies as avenues for investment. In conclusion, it can be noted that, in Nepal, the most active cryptocurrency users are middle-income people, self-employed males from nuclear families.

Table 2

Correlation matrix of dependent variables and independent variables

		agg_PU	agg_PEU	agg_T	agg_PR	agg_BI
agg_PU	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	272				
agg_PEU	Pearson Correlation	0.725**	1			
	Sig. (2-tailed)	0.000				
	N	272	272			
agg_T	Pearson Correlation	0.700**	0.685**	1		
	Sig. (2-tailed)	0.000	0.000			
	N	272	272	272		
agg_PR	Pearson Correlation	0.051	0.228**	0.087	1	
	Sig. (2-tailed)	0.403	0.000	0.153		
	N	272	272	272	272	
agg_BI	Pearson Correlation	0.502**	0.503**	0.512**	0.357**	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	
	N	272	272	272	272	272

** Correlation is significant at the 0.01 level (2-tailed).

* A correlation is statistically significant if it's "Sig. (2-tailed)" < 0.05.

The correlation matrix presents an understanding of how dependent variables (behavioral intention) relate to independent variables (perceived usefulness, perceived ease of use, trust, and perceived risk).

The results indicate a strong positive correlation between PU and BI ($r=0.502$, $p<0.01$) because the more useful it is perceived, the more probable it will be adopted by users, while the PEU score has a correlated result with BI ($r=0.503$, $p<0.01$) wherein users adopt cryptocurrencies for being easily understandable and operable. User confidence in blockchain security, crypto exchanges, and financial transactions has the most effect on this adoption because trust (T) has the strongest correlation with BI ($r=0.512$, $p<0.01$). However, participation in perceived risk (PR) has a negative but moderate correlation with BI ($r=0.357$, $p<0.01$), which means that if an individual understands risky factors, such as security, fraud, and regulation concerns, the chances of adoption are lower.

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Thus, it can be understood that PU and PEU are extremely correlated, with PU correlating with PEU at r=0.725, p<0.01; that is to say, those cryptocurrencies perceived as useful are also perceived as easy to use. Trust has a strong correlation with PU (r=0.700, p<0.01) and PEU (r=0.685, p<0.01), indicating a tendency that when they find cryptocurrencies beneficial and simple, users will be open to the adoption of cryptocurrencies. The correlation analysis endorses perceived usefulness, perceived ease of use, and trust as determinants of behavioral intention, while perceived risk exhibits a negative influence on adoption. These results reiterate the need for an adoption-ready, secure, user-friendly, and trustworthy cryptocurrency platform.

Table 3

Regression between independent variables and dependent variables

Model	R	R Square	Adjusted R Square	Std. The error in the Estimate
1	0.636a	0.405	0.396	0.55806

a. Dependent Variable: agg_BI

b. Predictors: (Constant), agg_PR, agg_PU, agg_T, agg_PEU

The proper analysis shows the correlation to be moderate to strong (R = 0.636) between the independent variables, i.e., perceived usefulness, ease of use, trust, and perceived risk, and behavioral intention to adopt cryptocurrency. The model accounted for 40.5 percent variance in behavioral intention, with an R-squared value of 0.405, further confirming what has been significantly influential in the making of the decisions by users. The adjusted R-squared of 0.396 would also add weightage for the model, and the standard error of 0.55806 indicates reasonable prediction accuracy. Overall, findings show that usefulness, ease of use, and trust are positively influencing adoption, while risk perceptions are negatively influencing user intention, thus pointing toward the construction of secure and user-friendly cryptocurrency platforms.

Table 4

ANOVA between independent and dependent variables

	Model	Sum of Squares	DF	Mean Square	F	Sig.
1	Regression	56.582	5	14.145	45.420	0.000b
	Residual	83.154	267	0.311		
	Total	139.735	272			

a. Dependent Variable: agg_BI

b. Predictors: (Constant), agg_PR, agg_PU, agg_T, agg_PEU

The ANOVA test finds the overall significance of the regression model in explaining behavioral intention (BI) with respect to cryptocurrency adoption. The F-statistic 45.420 with a p-value of 0.000 confirms the significance of the model very highly and states that there is a joint effect of all the independent variables (perceived usefulness, ease of use, trust, and perceived risk) on behavioral intention. The regression sums of squares 56.582 implies that the model accounts for a considerable share of variance in behavioral intention, and the residual sum of squares 83.154 stands for the unexplained variance. The mean of squares for regression 14.145 was substantially larger than the residual mean of square 0.311, reinforcing the model's effectiveness.

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Table 5

Coefficients between dependent and independent variables

		Unstandardized Coefficients		Standardized Coefficients		
	Model	**B**	**Std. Error**	**Beta**	**T**	**Sig.**
1	(Constant)	0.724	0.230		3.148	0.002
	agg_PU	0.230	0.069	0.252	3.328	0.001
	agg_PEU	0.068	0.071	0.073	0.955	0.341
	agg_T	0.257	0.071	0.259	3.649	0.000
	agg_PR	0.298	0.048	0.305	6.203	0.000

a. Dependent Variable: agg_BI

b. Predictors: (Constant), agg_PR, agg_PU, agg_T, agg_PEU

Model Fit Equation: Y= a + bx

Y=0.724+0.230X1+0.068X2+0.257X3+0.298X4

Where,

a = Behavior Intention, X1 = Perceived usefulness, X2 = Perceived ease of use

X3 = Trust, X4 = Perceived risk

Perceived Usefulness has a positive and statistically significant impact on Behavioral Intention (B=0.230, p = 0.001), suggesting that the more useful people perceive cryptocurrency transactions to be, the more likely they are to use them. Perceived Ease of Use has a positive but insignificant effect on Behavioral Intention (B = 0.068, p=0.341). This implies that ease of use does not strongly influence users' intention to engage in cryptocurrency transactions. Trust has a strong positive and statistically significant effect on Behavioral Intention (B=0.257, p=0.000), indicating that trust in cryptocurrency systems significantly enhances users' intention to transact. Perceived Risk has the highest impact on Behavioral Intention (B=0.298, p=0.000). This insight is critical for policymakers, fintech developers, and marketers aiming to enhance cryptocurrency adoption.

Hypothesis testing summary

Hypotheses	**Result**
H1: There is a significant relationship between perceived usefulness and behavioral intention toward cryptocurrency.	Accepted
H2: There is a significant relationship between perceived ease of use and behavioral intention towards cryptocurrency.	Rejected
H3: There is a significant relationship between trust and behavioral intention toward cryptocurrency.	Accepted
H4: There is a significant relationship between perceived risk and behavioral intention toward cryptocurrency.	Accepted

The present research endeavored to study the factors affecting the adoption of cryptocurrency in Nepal and generated multiple important insights. Initially, one remarkable finding was the huge gap in public awareness and understanding of cryptocurrency in Nepal. Many respondents were curious about cryptocurrencies but had no sound knowledge, hence the need for education. Sharma et al. (2020), among others, have highlighted that the absence of financial literacy among people acts as a barrier

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to the adoption of this and other emerging technologies. Other than the knowledge barrier, regulatory concern has come up as another major barrier for adoption. Participants expressed that they were uneasy with the existing unclear regulatory environment in Nepal.

Gupta and Singh (2019) stated that generally lacking clarity on regulations inhibits adoption, particularly in emerging markets. Concerning trust and security, respondents were apprehensive about the risk of hacking and fraud-an observation similar to the findings of Lee and Choi (2021), where security grounds remained the major reason preventing potential users. Participants from this study suggested that in addressing security concerns, infrastructure and support systems should be put in place to cultivate trust in the cryptocurrency ecosystem. Economic motivations, especially the possibility of high returns, are a strong driver of usage. The promise of high returns is the main attraction to most respondents for digital currency, as is confirmed by Zhang and Li (2020), who stated that speculation on returns is often a major factor in driving adoption in similar markets. Social networks were finally big influencers in the decision-making processes of participants when deciding to work with cryptocurrency. A majority of the respondents asserted to have been convinced by already existing peers or relatives already dealing in online money, consistent with previous findings by Bista and Shrestha (2018), wherein peer influence is a leading force in using cryptocurrencies, particularly in emerging economies. Generally, the findings suggest that even though there is potential for high uptake of cryptocurrency in Nepal, filling knowledge gaps, demystifying the regulations, ensuring security, and leveraging social networks will be crucial in overcoming the barriers to mass adoption.

Conclusion and Suggestions

To increase the adoption of cryptocurrencies in Nepal, the biggest hurdle that needs to be addressed is the level of public awareness, which can be done through educational endorsements. Government agencies, educational institutions, and cryptocurrency platforms should organize workshops, online courses, and seminars introducing the basics of cryptocurrencies, how they can benefit people, and what the potential risks of using them. To give further legal assurance to uncertain elements regarding digital wallets, exchanges, and ICOs, an explicit regulatory framework has to be formed. It would facilitate better protection for users on one side and businesses on the other. Security needs to be given utmost importance; hence, the platform and exchange should be put in place topmost security measures, such as two-factor authentication and encryption, while also instilling in their users' consciousness how to protect their assets. The social network channel also needs to be harnessed, whereby these platforms can promote adoption through referral programs and online communities consisting of users able to share their experiences. Future research should also examine the social and cultural factors that curtail adoption, such as distrust of financial institutions and family influence. Furthermore, government-issued initiatives, i.e., a national digital currency or partnerships with blockchain firms, would give further credibility and elevate acceptance of cryptocurrencies across Nepal.

This study is an additional piece in the expanding induced knowledge of the phenomenon, cryptocurrency adoption in Nepal. Any forthcoming study may look at the potential effect of regulatory policies on the adoption of cryptocurrencies. How does the restriction by law affect user behavior and market structuring? One may consider some comparative studies between Nepal and other emerging economies confronting almost the same hurdles in regulation, to have an overall notion of how different jurisdictions conceive one aspect of the field of cryptocurrency. Other future directions could then come about by considering the users' demographic and adoption trends to widen the understanding of how age, income level, and technological know-how differ, among others, in feature involvement in the cryptocurrency space. The collaborative research shows that social, cultural, and psychological peculiarities to risk profile, financial literacy, cognitive biases, etc., are strong contributors to investment decisions and thus deserve serious attention from research. Our studies have highlighted several key implications

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for policymakers, cryptocurrency platforms, and the financial sector. Policymakers should build clear regulations to form a secure and confident environment for cryptocurrency to be adopted, coupled with the promotion of financial literacy. Cryptocurrency platforms should build confidence by putting user security first through adequate security measures and education resources. For the financial sector, initiating integration of cryptocurrency and traditional banking could make it possible to enhance financial inclusion and especially.

Author contribution statement

The author solely conducted conceptualization, data collection, analysis, writing tasks, addressing the comments of reviewers, and finalizing the manuscript.

Funding

There is no funding support for this study.

Declaration statement

The authors declare no conflict of interest.

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JBM
The Journal of Business and Management
(B category academic journal as per UGC Nepal classification)

ISSN 2350-8868
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Age Discrimination at Workplace: A Study of Service Sector Organizations in Nepal

Durga Sapkota*, Bishnu Prasad Bhattarai**

*Research Scholar, Kathmandu, Nepal
**Patan Multiple Campus, Tribhuvan University, Lalitpur, Nepal

Received: 19 March 2025
Reviewed: 6 May 2025
Accepted: 28 May 2025
Published: 30 June 2025

Correspondence:
Bishnu Prasad Bhattarai
drbhattarai2019@gmail.com

Citation:
Sapkota, D., & Bhattarai, B. P. (2025). Age discrimination at workplace: A study of service sector organizations in Nepal. *The Journal of Business and Management, 9*(1), 30-45. https://doi.org/10.3126/jbm.v9iI.81197

Abstract

Background: Workplace age discrimination has been recognized globally as a significant issue, leading to negative outcomes for employees, employers, and their relationships. While management practices and positive organizational cultures can mitigate ageism, it remains an under-researched area in Nepal. Unlike gender or caste-based discrimination, ageism in Nepalese workplaces is rarely acknowledged, with limited understanding of its prevalence, forms, and impacts.

Objectives: The primary purpose of this study is to determine the relationship between selected factors (inter-generational contact, worker bias, job-age stereotypes and attitude towards elderly) and age discrimination in Nepalese service sector organization context.

Methods: The study uses a quantitative approach with descriptive, correlational, and causal-comparative methods to analyze factors influencing age discrimination in Nepal's service sector. Convenience sampling was used to collect 200 samples from service sector organizations within Kathmandu valley. Structured questionnaires were used to collect study data. The data collection period was September to November 2024.

Results: The regression analysis revealed an R^2 value of 0.267, indicating that 26.7% of variation in age discrimination is explained by the independent variables taken in the study. The model's statistical significance ($p < 0.01$) confirms that at least one beta coefficient is non-zero. Additionally, Variance Inflation Factor (VIF) values for all independent variables are below 2, confirming the absence of multicollinearity and validating the suitability of these variables for regression analysis.

Conclusion: The result of the study revealed that worker bias and job-age stereotypes have significant influence on age discrimination. Therefore, organizations have to provide more emphasis on these two variables in order to reduce age discrimination problems.

Keywords: Age discrimination, inter-generational contact, job-age stereotype, workplace bias

JEL Classification: C93, C9, J14, J1

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Introduction

Age discrimination refers to the act of making judgments and treating individuals or groups unfairly based on their age. It can occur in various settings, such as workplaces, shopping, and medical procedures. Age prejudice or ageism is a negative attitude or disposition toward aging and older people based on the belief that aging makes people unattractive, unintelligent, asexual, unemployable, mentally incompetent, which are more exaggerations about the older person (Atchley, 1997). Ageism is a set of beliefs, attitudes, norms, and values used to justify prejudice and subordination, particularly felt by seniors. Workplace age discrimination, also referred to as ageism, involves employees being disadvantaged or treated unfairly on the basis of their age or membership in a certain age group (Posthuma et al., 2012). Workplace age discrimination is comparable to other types of workplace discrimination, such sexism and racism, in that it is largely based on people's prejudices and perceptions of particular social groups (such as younger or older employees). Unlike racism and sexism, age discrimination affects almost everyone at some phase in their lives, but other social aspects are less permeable. Surprisingly, researchers have paid less attention to workplace age discrimination than sexism and racism so far.

Research shows that younger employees tend to have fewer positive beliefs about older employees than older employees (Hassell & Perrewe, 1995). As a result, favorable perceptions of older workers appear to grow with employee age. Interestingly, the same research found that older supervisors tend to hold more negative views of older employees compared to their younger counterparts. This observation is linked to the older supervisors' desire to distinguish themselves from the group of "older employees.". A meta-analysis of studies using simulated employment contexts found that younger raters gave less favorable ratings to older employees when they did not receive job relevant information and had to rate older and younger employees at the same time (Finkelstein et al., 1995). Negative age stereotypes are one of the main causes of age discrimination in the workplace. Age stereotypes are unfounded judgments and generalizations about workers based on their age, without credible evidence to support them.

A considerable amount of empirical research has shown that unfounded negative stereotypes about older employees are highly prevalent in many work situations, and that they tend to be similar among women and men (Posthuma & Campion, 2009). For example, older employees are mostly seen as less motivated and flexible than younger employees. Even though the most salient stereotypes about older employees are negative, research has also shown that attitudes and beliefs about older employees are multidimensional, such that older employees are perceived negatively about some characteristics and positively about other characteristics (Bal et al., 2011). Workplace age discrimination can result in negative outcomes for both employee and their employers, as well as the employee–employer relationship (Posthuma & Compion, 2009). Finally, research has shown that certain management practices and a positive organizational age culture may reduce the occurrence of age discrimination in work settings to some extent (Zacher & Gielnik, 2014). Thus, there is a nexus between the work environment and the retention of employees (Dhakal et al., 2024).

In the context of Nepal, age discrimination has not yet been widely recognized or addressed as a significant discriminatory factor, particularly in workplace settings. Unlike more prominently discussed issues such as gender or caste-based discrimination, ageism remains an under-researched and overlooked area in Nepalese society. There is a lack of awareness and acknowledgment of how age-based stereotypes and prejudices impact individuals, especially in professional environments. Despite the global recognition of age discrimination as a critical issue, Nepal has seen minimal academic or policy-focused research on this topic. As a result, there is limited understanding of the prevalence, forms, and consequences of ageism in Nepalese workplaces, highlighting a critical gap that needs to be explored to foster inclusivity and equity in the country's service sector and beyond. In this scenario, the statement of the problem of this study was: Does the relationship between selected factors (inter-generational contact, worker bias,

job-age stereotypes and attitude towards elderly) and age discrimination in Nepalese service sector organization context?

This study focuses on identifying the major factors contributing to age discrimination in Nepal's service sector workplaces. It aims to explore the current state of ageism, understand employees' experiences of perceived discrimination, and analyze the impact of specific factors such as organizational policies and cultural attitudes. Additionally, the study seeks to determine the most significant factors driving age discrimination and establish their relationship with workplace practices. In this connection, the primary purpose of the study was to determine the relationship between selected factors (inter-generational contact, worker bias, job-age stereotypes and attitude towards elderly) and age discrimination in Nepalese service sector organization context.

The study found that worker bias and job-age stereotypes have significant influence on age discrimination. Therefore, organizations have to provide more emphasis on these two variables in order to reduce age discrimination problems.

This study is organized into five sections. The first section outlines the background, objectives, problem statement, rationale, and significance of the study. The second section presents a review of relevant literature, identifying gaps that inform the study's hypotheses. The third section describes the research methodology, including population, sample size, and procedures. The fourth section presents and discusses the findings. Finally, the fifth section provides the conclusion and recommendations.

Review of Literature

Age bias in the workplace is a critical area of research in organizational studies. Numerous theories have been developed to explain the underlying motivations for age-based discrimination in employment settings. To strengthen the theoretical foundation of this study, the first section examines key conceptual frameworks, followed by a review of empirical research.

Several major theories proposed by scholars across different regions provide insight into this phenomenon. These are discussed below.

Terror Management Theory (TMT) by Greenberg et al. (1986), posits that the fear of death leads individuals to uphold cultural beliefs and self-esteem as a defense mechanism. Older adults often serve as reminders of mortality, triggering unconscious anxiety and resulting in age-based biases. This can be seen in workplace preferences for younger employees, media glorification of youth, and broader social distancing from aging populations.

Social Identity Theory (SIT) developed by Tajfel and Turner (1979), explains how group membership shapes self-concept and intergroup behavior. People divide themselves and others into groups (e.g., age, gender), favor their own group, and may discriminate against out-groups. SIT helps explain age discrimination by showing how society categorizes people as "young" or "old," with younger individuals often viewed as more capable, leading to discrimination against older individuals. These stereotypes are reinforced by media and workplace policies, marginalizing older people.

Implicit Bias Theory developed by Greenwald et al. (1998), explains how unconscious attitudes and stereotypes affect decisions and behavior. These automatic biases, shaped by cultural and personal factors, influence areas like hiring, healthcare, and social interactions. For example, managers may unconsciously favor younger workers, and doctors may underestimate older patients' recovery potential. Implicit biases can be measured through tools like the Implicit Association Test and can be addressed through awareness, blind hiring practices, and inter-generational interactions (Nelson, 2024).

The empirical studies have been continued by different scholars in different parts of the world to date

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2025. Some major studies related to the study have been explained as follows.

Iverson and Pullman (2000) conducted a study on older hospital employees to determine why they were being let go of the hospital. The study found that older employees who worked full-time were the most likely to be downsized. The main reason for their elimination was not their work performance, but rather the cost and the belief that older workers have a negative impact on the organization's finances. Given the increasing number of older individuals still working, it is important to recognize the discrimination against these workers in our society.

Kunze et al. (2010) analyzed that the emergence of perceived age discrimination climate on the company level and its performance consequences. This study examines the effects of age diversity in organizations using data from 8,651 employees across 128 companies. The analysis with Structural Equation Modeling showed that more age diversity is linked to higher perceptions of age discrimination. This sense of discrimination was found to harm company performance, with employee commitment acting as a mediating factor.

Furunes et al. (2010) explored that the age discrimination at workplace and his report shows an increase in perceived age discrimination among older employees. A self-report questionnaire was given to a random sample of 2,653 primary and secondary school teachers in Norway, Sweden, and Finland. Responses were measured using a Likert scale to assess agreement levels. Correlation analyses were done to examine the relationships between variables. The study showed that age discrimination continues to be a common problem in the workplace, affecting various stages of employment, such as recruitment and professional development.

James et al. (2012) conducted a study to explore how employee perceptions of unfair treatment towards older workers relate to their level of engagement at work. The study aimed to understand the impact of job quality on employee engagement in different groups of workers at a retail organization called "Citi Sales". The relationship between perception that older workers are likely to be promoted was tested among samples of 4,500 workers ranging from 18 to 94 years, employed in retail sector across three regions in the USA. They used linear regression, and participants were requested to rate on a five-point Likert scale. The data was analyzed using standard regression techniques, mean values, and standard deviations. Result shows that negative age-related perceptions can lead to lower levels of commitment to the organization, which is one aspect of employee engagement.

Solem (2015) asserted that ageism and age discrimination in working life. The author explores the cognitive, affective and behavioral aspects of ageism in working life in Norway. The study has used correlation and logistic regression analysis with various study variables. The study reveals that managerial views of workers over 50 are mostly positive. Many see their performance as similar to or even better than that of younger employees. However, bias still exists. Hiring managers often hesitate to interview applicants in their late fifties. This shows a gap between what they say and how they actually recruit.

Bodunrin (2018) analyzed that the discouraging ageism at workplace. This study looks at how age discrimination impacts job demotions and perceptions of ability among older adults. Using questionnaire data from elderly residents in Lagos, Nigeria, including veterans and retirees in senior care facilities, the research found that 95% of respondents felt marginalized and lost dignity because of age-related discrimination in various areas of life, even after retirement.

Yeung et al. (2021) conducted a study to examine how perceived age discrimination (PAD) affects work-related outcomes through job resources and demands. Using an online survey of 333 Chinese employees, the researchers measured workplace age discrimination, job resources and demands, work engagement, intention to stay, and work strain, followed by mediation analysis. The results indicated that PAD was associated with fewer job resources and greater job demands. Importantly, the study found that support

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from supervisors and coworkers helped mitigate the negative effects of PAD on both work engagement and employees' intention to remain with the organization. These findings emphasize the importance of social support in the workplace to lessen the harmful effects of age discrimination.

Beier (2022) reviewed the psychological literature on age stereotypes and their effects in the workplace. Both implicit and explicit biases against older workers were shown to limit access to training and advancement. These biases contribute to turnover and lower productivity. The review also highlighted successful inclusion strategies, such as intergenerational mentoring. The findings offer a framework for reducing ageism through organizational policy.

Lagace et al. (2023) analyzed that inter-generational relationships and knowledge-sharing initiatives can lessen ageism in the workplace and age-based prejudice against members of one's own group. Survey was done among 500 Canadian younger and older workers. The model suggests that knowledge sharing practices mediate the relationship between intergroup contacts, older worker perceptions, and age-based discrimination, thereby enhancing employees' intentions and work engagement.

Batinovic et al. (2023) found that older candidates received significantly fewer interview callbacks than younger ones. This trend was consistent across various countries and industries. The study highlights that even well-qualified older applicants are disadvantaged. It calls for interventions to reduce bias during recruitment processes.

Waligóra (2024) investigated how age diversity climate affects employees' connection to their organization. Employees who felt valued regardless of age were more loyal and motivated. In contrast, those who perceived age discrimination were more likely to feel alienated. This study emphasizes the importance of inclusive leadership and HR practices. Promoting fair treatment enhances organizational identification and reduces turnover.

Wu et al. (2025) reviewed research on how ageism and intergenerational relationships shape workplace environments. They found that organizations with supportive intergenerational climates experienced lower levels of age-based bias. Ageism often intersects gender and other factors, worsening discrimination. Promoting collaboration between age groups helps reduce stereotypes. Their study supports inclusive HR practices to enhance sustainability and fairness.

While there is a growing body of literature on age discrimination in various global contexts, limited research has specifically addressed the factors contributing to ageism within Nepal's service sector workplaces. The current understanding of the relationship between organizational policies, cultural attitudes, and age-related discrimination remains under-explored in the context of Nepal. Additionally, while studies have focused on age discrimination in general, few have examined the lived experiences of employees within Nepalese organizations, particularly how perceived discrimination influences workplace dynamics and practices. This study seeks to fill this gap by identifying the specific factors contributing to age discrimination in Nepal's service sector and exploring their impact on workplace culture and practices, thereby providing actionable insights for fostering inclusivity.

Based on various past empirical literature, the conceptual framework on age discrimination in service sector organization in Nepal consists of four independent variables i.e., inter-generational contact, older worker bias, attitude toward elderly and Job-age stereotype.

Figure 1

Conceptual Framework

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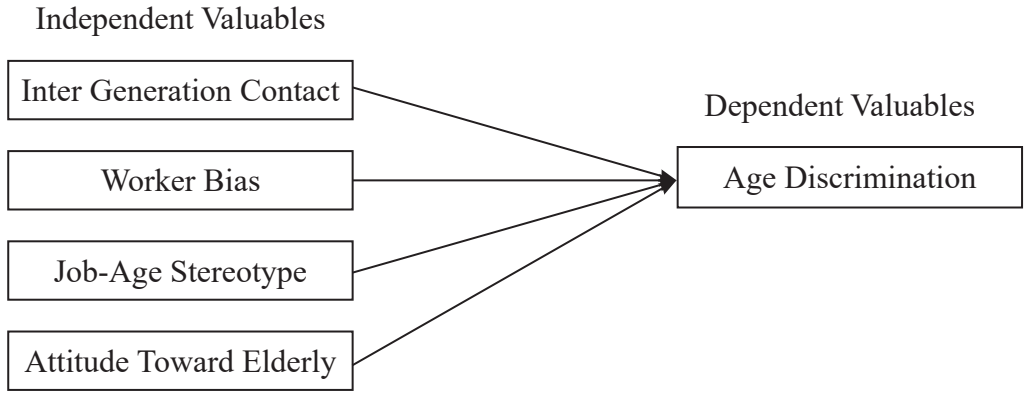

Materials and Methods

This study includes 20 service sector organizations operating in Nepal, which were purposively selected as the target sample. Only service sector organizations were included to ensure alignment with the study's objective of analyzing age discrimination in professional service environments. The respondents comprised employees from various organizational levels, including junior staff, assistants, officers, managers, senior managers, managing directors, and Chief Executive Officers (CEOs).

For data collection, a non-probability sampling technique - convenience sampling was employed due to its practical advantages and accessibility. This study was conducted over a period of three months. The data were collected from September to November 2024.

The research applied a combination of descriptive analysis, correlation analysis, and causal-comparative research design to explore the relationships among factors influencing age discrimination in Nepalese service organizations.

A structured questionnaire was developed to gather information on various factors contributing to workplace ageism. The questionnaire was adopted from the research of Tuckman and Lorge (1953), Iweins et al. (2013), Posthuma et al. (2012), and Wise and Uzel (2021). The questionnaire consisted of two main sections. The first section collected demographic information, including respondents' age, education level, and corporate position. These data were primarily used for descriptive analysis. The second section focused on the key study variables. The dependent variable, age discrimination, was measured using 6 statements. The independent variables included inter-generational contact (measured by 5 statements), worker bias (8 statements), job-age stereotypes (7 statements) and attitude toward the elderly (8 statements). Each item was measured using a 5-point Likert scale, ranging from 1 = Strongly Disagree to 5 = Strongly Agree. Participants' agreement levels with these statements reflected their perceptions of each measured concept (Lagace et al., 2023).

The Model

The following model has been employed to determine the age discrimination in context of service sector organization in Kathmandu valley.

$AD = \beta 0 + \beta 1IC + \beta 2WB + \beta 3JA + \beta 4ATE + et$

Where,

AD = Age Discrimination

$\beta 0$ = Constant term

$\beta 1$ to $\beta 4$ = Coefficient of Variables

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IC= Inter-generation Contact

WB = Worker Bias

JA = Job-Age Stereotypes

ATE = Attitude Toward Elderly

et = error terms

Variables and Hypothesis

Study has selected age discrimination as the dependent variable and has taken inter-generational contact, worker bias, job-age stereotypes and attitude toward elderly as independent variables. The following sections provide explanations of the study's measurements and hypotheses.

Dependent Variable

Age Discrimination

Age discrimination is the act of treating someone unfavorably because of their age, and it is a significant problem that affects the self-esteem and overall well-being of individuals. It is essential for society to work towards eliminating age discrimination and changing our negative perceptions of aging. Similar findings have been reported in previous studies, including Iverson and Pullman (2000), Kunze et al. (2010), Posthuma et al. (2012), Fineman (2014), and Legace et al. (2023).

Independent Variables

The study also has been taken Inter-generational contact, worker bias, job-age stereotype, attitude toward elderly as independent variables. Independent variables of the study have been described as follows.

Inter-generational Contact

Inter-generational contact is commonly referred to as positive social interactions between younger and older adults. Extensive research has examined how high-quality intergenerational contact influences workplace relations and employee attitudes across age groups. Lagace et al. (2023) proposed a model demonstrating that inter-generational relationships and knowledge-sharing can reduce workplace ageism. The result suggests that knowledge sharing practices can mitigate the impact of age-based discrimination on older workers, thereby boosting their intentions and work engagement. Other studies in support are Brubaker(1999), Wise et al. (2021).

H1: *There is a negative relationship between inter-generational contact and age discrimination*

Worker Bias

Worker bias presents a significant challenge, often hindering employees from achieving their professional aspirations or forcing them out of the workforce prematurely. Consequently, organizations deprive themselves of accessing skilled and experienced professionals. Such bias frequently manifests in assumptions like employers believing mature workers will demand excessive compensation. “If you are an employer who won’t interview older people because you don’t think they will accept the pay, then you don’t change your view,” says Cappelli. Axelrad et al. (2023) explores the prevalence of negative and ambivalent age-based stereotypes in organizations. It finds that managers often hold ambivalent stereotypes about older workers, with positive perceptions of their personal attributes and negative perceptions of their employability. However, these stereotypes decline with increased intergroup contact and accountability triggers. Supporting studies include those by Cappelli and Novelli (2010) and Bidwell et al. (2013).

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H2: *There is a positive relationship between worker bias and age discrimination.*

Job-Age Stereotype

Job-age stereotype is an assumption in which particular age group is related to the particular job. Generally, people assume that an entry level job is appropriate for the young age group employees, and a decision level job is appropriate to older employees. In many countries especially in developing countries like Nepal and India, there is age norm that governs the job type. For example, in banking sector of Nepal, vacancy announcement for junior assistant is given with age limit (age not exceeding 28 can apply). Rosen et al. (1976) examines the impact of age stereotypes on 142 business undergraduates' managerial decisions, finding that these stereotypes lead to discrimination against older employees. The findings suggest organizational changes to accommodate the unique needs of older workers. Other supporting studies include Finkelstein et al. (2015), Posthuma et al. (2009), and Posthuma et al. (2012).

H3: *There is a positive relationship between Job-age stereotype and age discrimination.*

Attitude Toward Elderly

People's attitude toward elderly people also determines their level of discrimination on the basis of age. If people are good toward the elderly, love to talk with them and help them across street, it is perceived that their attitude is good toward elderly and does not contribute to age discrimination. On the contrary, if people avoid old people assuming they are cranky and worthless, assume older people have bad health and less potential for development, such people may contribute to the age discrimination at workplace. Schwartz et al. (2001) investigated the relationship between young adults' contact with older adults and their attitudes towards the elderly. It hypothesized that self-reported quality of contact with older individuals was related to attitudes, while frequency of contact had no effect. Results showed that favorable quality of contact significantly influenced attitudes. Other supporting studies include Drury (Ed., 1993) and Murphy-Russell (1986).

H4: *There is a positive relationship between a bad attitude toward elderly and age discrimination.*

Results and Discussion

The profile of respondents is presented in Table 1. The majority of respondents (i.e.55%) are male, with 110 males and 90 females. Most respondents (i.e. 49.5%) are aged 26-35, followed by under 25, 36-45 (i.e.16%), and above 45 (i.e.10%). In terms of education, 55.5% hold a master's or PhD, 37.5 percent have a bachelor's degree, and 7 percent are intermediate graduates. Regarding work experience, 38.5% have 2-5 years, 28% have under 2 years, 17.5% have 5-10 years, and 16% have over 10 years. By position, 40% are officers, 30% are teachers/professors, 17.5% are managers, and 12.5% are executives.

Table 1

Profile of the Respondents

Respondents Character	No. of Responses	Percentage
Gender		
Male	110	55
Female	90	45
Total	200	100
Education		
Undergraduate	14	7
Graduate	75	37.5

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Master's and above	111	55.5
Total	**200**	**100**
Experience		
Below 2 years	56	28
2 to 5 years	77	38.5
5 to 10 years	35	17.5
Above 10 years	32	16
Total	**200**	**100**
Designation		
Officers	80	40
Managers	35	17.5
Executive	25	12.5
Others	60	30
Total	**200**	**100**

The descriptive statistics summary has been presented in Table 1. The study sought to determine the average score of all independent and dependent variables and to identify the deviation in the opinion of respondent with relation to each statement.

Table 2 depicts the coefficient of Cronbach's alpha for all the variables. Cronbach's alpha was employed to measure the reliability and internal consistency of the survey items across all constructs, ensuring the validity of the results drawn from the data.

Table 2

Coefficient of Cronbach's Alpha

Variables	Cronbach's alpha	No. of items
Age Discrimination	0.709	6
Intergenerational Contact	0.640	4
Worker Bias	0.765	8
Job-Age Stereotype	0.707	7
Attitude Toward Elderly	0.643	7
Overall	0.822	33

The reliability and validity result in table 2 shows that the instrument was both reliable and valid with Cronobach's alpha of 0.822 percent. There is no restriction to go further test.

Table 3

Descriptive Statistics of Study Variables

Variables	Min	Max	Mean	SD
IC	1.750	5.000	3.946	0.571
WB	1.750	4.630	3.092	0.650
JA	2.290	4.710	3.596	0.468
ATE	1.860	4.430	3.198	0.536
AD	1.500	4.830	3.736	0.540

Note. Field survey, 2024.

The mean scores of these variables were calculated using 5-point likert scale of 1 to 5 for which 1

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represents Strongly Disagree and 5 represent Strongly Agree. The highest mean score was 3.946 for inter-generational contact and likewise, the lowest was 3.092 for worker bias. The variable Job- age stereotype has the lowest value of standard deviation of 0.468 and at the same time, variable worker bias has the highest standard deviation with the value 0.650. The findings in Table 3 indicate that inter-generational contact has greater impact on age discrimination followed by Job-age stereotypes, attitude toward elderly, and worker bias respectively.

The Pearson correlation coefficient of study variable is presented in Table 4. Age discrimination was dependent variable inter-generational contact, worker bias, job-age stereotype and attitude towards elderly were independent variables.

Table 4

Person's Correlation among Study Variables

Variables	IC	WB	JA	ATE	AD
IC	1				
WB	0.061	1			
JA	0.005	0.323**	1		
ATE	0.301**	0.389**	0.131	1	
AD	0.132	0.279**	0.344**	0.157*	1

N=200; Correlation is significant at **p < 0.01 and * p < 0.05 (2-tailed)

Table 4 depicts the correlation matrix among the variables used in this study. The above correlation matrix shows that age discrimination is positively associated with inter-generational contact, worker bias, job-age stereotypes and attitude toward elderly as the p-value of all the independent variables is less than 0.05 (i.e. p<0.05). Generally, for absolute Pearson's Correlation Coefficient (r), 0-0.39 is regarded as weak correlation, 0.4-0.59 is regarded as moderate correlation and 0.6-1 is regarded as strong correlation (Cohen, 1988). The output as above clarifies that there exists a moderate and weak correlation between the mentioned variables for this study. The attitude toward elderly and age discrimination has a weak magnitude of association with their respective correlation value being 0.301.

Table 5 has been presented with regression analysis of study variables. The regression model coefficients results show the significance of each independent variable on the respective dependent variables.

The R-squared value of 0.267 indicates that approximately 26.7% of the variation in the dependent variable, i.e., age discrimination is explained by the independent variables included in the model. The F-statistics of 9.576 with a p-value of 0.000 (p < 0.05) implies that the overall regression model is statistically significant, which means combination of independent variables significantly predicts the dependent variable.

According to the results shown in the table, two independent variables i.e., worker bias and job-age stereotypes have significant impact on age discrimination because the p-value of those independent variables is below 0.05. While the p-value of inter-generational contact and attitude toward the elderly is greater than 0.05, indicating that it does not significantly affect dependent variable i.e. age discrimination.

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Table 5

Regression Coefficients of Study Variables

Variables	Coefficients	Std. Error	t-value	p-value	Collinearity Statistics	
					Tolerance	VIF
(Constant)	1.646	0.391	4.208	0.000		
IC	0.127	0.077	1.661	0.098	0.906	1.104
WB	0.163	0.070	2.324	0.021	0.772	1.296
JA	0.288	0.070	4.118	0.000	0.896	1.117
ATE	0.018	0.075	0.242	0.809	0.772	1.296
R-Squared = 0.267, Adjusted R-Squared = 0.247, F-Statistics = 9.576, P-value = 0.000						

In addition to that, all the independent variables in this study have positive relationship with dependent variable which can be observed by looking at "Unstandardized Coefficient (B)" where all the values are positive and VIF of all independent variable is near to 1 which means there is no significant multicollinearity among the independent variables. Therefore, each independent variable provides unique and non-redundant information in explaining the dependent variable. Job-age stereotypes have the highest positive impact on age discrimination having the value equal to 0.288 followed by worker bias (0.163), attitude toward elderly (0.018) and inter-generational contact (0.127).

From the results of the study hypothesis summarized in Table 6, it reveals that hypothesis H2 and H3 were supported while hypothesis H1 and H4 were not supported. This Indicates that the two variables, worker bias and Job-age stereotype were more influential in age discrimination in the Nepalese service industry.

Table 6

Results of hypotheses

Hypothesis	Expected Sign	Actual Sign	p-value	Measurements	Results
H1	-	+	.098	P-value > 0.05	Not Supported
H2	+	+	.021	P-value <0.05	Supported
H3	+	+	.000	P-value < 0.05	Supported
H4	+	+	.809	P-value > 0.05	Not Supported

The results of the study are aligned with previous research, particularly regarding the impact of worker bias and job-age stereotypes on age discrimination. Iverson and Pullman (2000) highlighted that older workers are often downsized due to perceptions about their negative impact on the organization, which resonates with the significant effect of worker bias found in the study results. The findings from Rupp et al. (2006) suggest that managerial ageism leads to more severe recommendations for older employees, which parallels the influence of job-age stereotypes on age discrimination in study.

The weak impact of inter-generational contact and attitude toward the elderly in the study is also consistent with findings from Kunze et al. (2010), who showed that organizational-level perceptions of age discrimination negatively affect performance outcomes but may not directly relate to personal inter-generational relationships or attitudes. The moderate R-squared value in the study (26.7%) suggests that while these factors contribute to age discrimination, there are likely additional elements that influence the phenomenon, supporting the notion that age discrimination is complex and multifaceted, as highlighted in previous study of Wood et al. (2008).

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Conclusion and Suggestions

Age discrimination in the workplace refers to unfair treatment in employment decisions based on a person's age. It typically affects older workers but can also impact younger employees, leading to biased outcomes in hiring, promotion, or termination.

The main purpose of the study is to identify major factors contributing to age discrimination at workplace in service sector organization. The study uses a quantitative approach with descriptive, correlational, and causal- comparative methods to analyze factors influencing age discrimination in service sector 200 organization within Kathmandu valley. Structured questionnaires were used to collect study data. The data collection period is September to November 2024. The findings indicate that all the independent variables (inter-generational contact, worker bias, job-age stereotypes and attitude toward the elderly) are positively associated with age discrimination. This is supported by the fact that all variables have positive unstandardized coefficients in the regression analysis, suggesting that increases in these factors are associated with increased levels of perceived age discrimination at the workplace. Job-age stereotypes have the highest impact on age discrimination, having the highest value of unstandardized coefficients which implies that it has the strongest impact on age discrimination compared to the other variables.

Since job-age stereotypes strongly influence age discrimination, organizations should implement training programs to challenge these biases and promote age diversity. Further, encouraging inter-generational contact can help reduce age bias, making it important to design team structures and roles that support age-diverse collaboration.

The result of the study revealed that worker bias and job-age stereotypes have significant influence on age discrimination. Therefore, organizations have to provide more emphasis on these two variables in order to reduce age discrimination problems.

Based on the conclusion of the study, policy makers and HR professionals in Nepal should take active steps to reduce age discrimination in the workplace. Policy makers should enforce clear anti-age discrimination laws, promote age-inclusive workforce policies, and mandate awareness training on age bias. HR professionals should ensure fair and age-neutral recruitment, provide equal development opportunities for all age groups, and regularly conduct sensitization programs to challenge job-age stereotypes and worker bias. Encouraging inter-generational collaboration and monitoring workplace attitudes can further support an inclusive environment where individuals are valued for their skills, not age.

Furthermore, this study is limited to service sector organizations with a small sample size. Future research can explore other sectors, including different variables, and use qualitative methods or advanced tools for further study.

Author contribution statement

Durga Sapkota: Data curation, review of literature, methodology, writing – original draft. **Bishnu Prasad Bhattarai:** Conceptualization, data analysis, writing, review and editing. All author(s) involved in addressing the comments, revision of the paper and finalization of manuscript.

Funding

There is no funding support for this study.

Declaration statement

The authors declare no conflict of interest.

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JBM
The Journal of Business and Management
(B category academic journal as per UGC Nepal classification)

ISSN 2350-8868
Volume IX | Issue 1 | June 2025

Entrepreneurial Mindset Development through Curriculum and Infrastructure Requirements towards the Making of Developed India: Issues and Challenges

Hitesh Tripathi*, Gyanendra B. S. Johri**, Pradeep Kumar Srivastava**, Sharad Srivastava***
*School of Management & Commerce, Sanskriti University, Mathura, India

**Department of Commerce & Business Administration, University of Allahabad, Prayagraj, India
***Department of Commerce, Indira Gandhi National Tribal University, Amarkantak, India

Received: 25 March 2025
Reviewed: 5 May 2025
Accepted: 27 May 2025
Published: 30 June 2025

Correspondence:
Pradeep Kumar Srivastava
pradeep@allduniv.ac.in

Citation:
Tripathi, H., Johri, G. B. S., Srivastava, P. K., & Srivastava, S. (2025). Entrepreneurial mindset development through curriculum and infrastructure requirements towards the making of developed India: Issues and challenges. *The Journal of Business and Management, 9*(1), 46-58. https://doi.org/10.3126/jbm.v9iI.81183

Abstract

Background: Entrepreneurial mindset development is increasingly considered essential in higher education to foster students' innovation, self-reliance, and economic resilience. However, traditional academic curricula often fall short in promoting such skills.

Objectives: This study explores how an academic curriculum can be effectively designed to foster the development of an entrepreneurial mindset in students.

Methods: A pilot study was conducted using a structured online questionnaire administered to academicians, students, and entrepreneurs across various domains. Exploratory Factor Analysis (EFA) uncovered underlying relationships between curriculum elements and entrepreneurial mindset development.

Results: Two key factors emerged from the EFA: (1) thematic theory, including classroom lectures and practical sessions, and (2) the establishment of an Entrepreneurship Development Cell (EDC) to support experiential learning. These elements were found to be instrumental in fostering entrepreneurial thinking.

Conclusion: The findings highlight the need for a paradigm shift in academic environments, emphasizing entrepreneurial actions over conventional pedagogies. Strengthening collaboration between academic, industry, and local communities is crucial. The study recommends embedding entrepreneurship into the university curriculum to cultivate independence and innovation among students, while future research should further identify additional cognitive and structural factors influencing mindset development.

Keywords: Academic curriculum, entrepreneurial education, entrepreneurial mindset development, ideation rationalization

JEL Classification: Z130, Z150, Z190

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Introduction

Fundamentally, education is a tool for the growth and stability of a nation. Education is a flexible journey that adjusts to society's evolving needs and desires. The success of education relies on continuous and thorough assessment of the educational framework. Assessment is a comprehensive concept that involves forming well-informed judgments by analysing quantitative data obtained through testing or measurement. It can also qualitatively evaluate an individual's unique behavioural traits. A country's education level significantly impacts its citizens' success in the fiercely competitive global economy. Given the swift alterations in economic dynamics caused by globalisation, education systems in developing nations like India cannot afford to produce an inadequately prepared workforce to navigate challenging market conditions. These nations require a proficient labour force that can effectively secure the well-being of their populace amidst an unpredictable business landscape and a fiercely competitive employment sector. Only under these circumstances can our institutions generate optimal human capital, equipped with essential skills to be self-reliant and able to make substantial contributions to the nation's growth and progress. A significant drawback of the Indian educational system is its failure to adequately prepare graduates for self-employment and entrepreneurial endeavours, often directing them towards conventional employment routes.

The significance of entrepreneurship education stems from how vital entrepreneurs are to the economy. Since new and small businesses are the primary producers of new jobs, entrepreneurship is a constant concern in most nations. Entrepreneurship education is a form of instruction that assists individuals in acquiring the knowledge, skills, attitudes, and perspectives essential for conceptualising, planning, and establishing a business that will yield sustained advantages and growth. Entrepreneurship requires taking risks, owning property, being responsible for it, and having freedom, which is the ability to make decisions on one's own or in groups without interference from others. It also includes having the necessary knowledge, abilities, and skills to produce and use resources and maximise the potential of already-available resources for wealth creation. "Entrepreneurship" also refers to various skills in managing, innovating, and manipulating conditions to achieve long-term benefits. Dexterity, efficiency, competence, adaptability, creativity, taking and bearing risks within enterprises, managing conditions to achieve sustainable profits, innovation, and manipulation are all aspects of entrepreneurship.

According to Walter and Block (2016), “entrepreneurship education consists of curricular and extracurricular opportunities through which people can learn about various facets of entrepreneurship, such as recognising and seizing business opportunities, stages for implementing a business idea, tactics for growing their ventures, management practises” (Dima, 2009; Miron et al., 2009), and other related topics. By entrepreneurship education, Walter and Block (2016) mean teaching people how to start and run their businesses.

Harms (2015) and Shrestha et al. (2024) offer another viewpoint on the significance of entrepreneurship education. The author claims that by assisting students in developing their skills and preparing them for self-employment in a complex and uncertain market, entrepreneurship education boosts the number of entrepreneurs.

“Incorporating entrepreneurial courses into engineering, humanities, science, and educational faculty programmes at universities is a timely and relevant yet understudied phenomenon of student entrepreneurship” (Fini et al., 2016). This is because universities need their graduates to have a particular mindset and behaviour. “Additionally, the appropriateness of various forms of entrepreneurial education and the selection of pedagogical approaches are given much consideration” (Ojastu et al., 2011).

Consequently, entrepreneurship is recognised as the primary catalyst for economic expansion, given its role in establishing fresh enterprises, generating employment, and fostering self-employment by

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leveraging new knowledge and skills. This trend has led to increasingly innovative and competitive economies, a critical concern for India in the present scenario.

Review of Literature

The term "development" pertains to the degree of economic advancement a nation has attained, typically assessed, in part, by the country's Gross National Product (GNP) per capita. To assess the correlation between a nation's developmental stage and educational performance, a UNESCO report from 1995 utilised the literacy rate as a significant indicator. The justification for this is that in recent years, it has become increasingly crucial to consider the relationship between a nation's level of economic development and its literacy attainment. Even relatively wealthy nations find their economic performance hampered by a labour force lacking skills geared toward vocational employment (Encarta Encyclopedia, 2002). Illiteracy is the foremost and most impactful factor hindering economic development in developing nations. The growth of a nation's material and human resources is the foundation of national development. Development is defined as improving the standard of living for people in areas such as access to food, clean water, shelter, roads, and medical care. Therefore, society or the people are the targets of development. Eriba (2006) argues that national development is the complete structural transformation of a country's socioeconomic, political, cultural, scientific, and educational systems. “It is strongly recommended that development must not only be induced but also maintained” (Emaikwu, 2010). Resource distribution has improved with sustainable development, both now and over time.

Guaranteeing that present requirements are fulfilled through sustainable development is crucial to preserving the capability of future generations to fulfil their own needs. Education for Sustainable Development encompasses understanding, valuing, and actively engaging in decisions concerning the appropriate ways to conduct activities at a local or global scale, ensuring an improved quality of life in the present and for generations to come. Additionally, empowering individuals to enhance their skills involves integrating human and material resources. Human development emphasises the advancement of people to enhance human capital, while sustainable development concentrates on resource utilisation, investment allocation, technological advancements, and institutional enhancements. It ensures a harmonious interplay of change by change. “Poverty, which knows no geographic boundaries, is present throughout the nation” (Osimibi, 2003). The cause of this issue is unemployment. Education is widely acknowledged as the most effective treatment for poverty.

The total "vocationalization" of education will be accomplished if entrepreneurship education is a core component of general education. "Vocationalization" integrates skill development into a curriculum based on a chosen occupational field to make the training recipient self-sufficient and employed. Integrating the acquisition of entrepreneurship skills within the educational system will empower young individuals to nurture an entrepreneurial mindset, encouraging creativity and fostering innovation. Within any country's economic framework, these empowered individuals can become job creators, rather than simply seeking employment opportunities. “The inclusion of entrepreneurship education in the educational system will inevitably strengthen existing alliances that will encourage the possibility of utilising a variety of perspectives, knowledge, skills, and experiences for national development. This will lead to effective and efficient resource management, sustained economic growth, and scientific and technological advancement” (Ekong, 2008).

Armed with entrepreneurial skills, competent individuals can significantly influence the national economy and actively contribute to development. This shift can lead to an economy with more employers than employees. The national landscape transforms into a business-oriented economy, aiming to address social inequalities through human-centric socioeconomic development and reform. Students can learn how to anticipate and adapt to change through the study of entrepreneurship. “Students learn that although a job may be completed today by carrying out a specific task, tomorrow, an entirely new set of skills may be

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required, and since businesses are constantly changing, workers need to learn ways to do a given job" (Bettina, 1991)."Graduates of entrepreneurship programmes will undoubtedly possess competencies that improve their managerial, leadership, and business ownership skills" (Dixon et al., 2005).

"Including entrepreneurship education in university curricula will also impact how young people are transformed, resulting in decreased youth unrest, theft, political thuggery, unemployment, etc. The issues of resource waste, capital waste, and corruption will be resolved. The tendency toward greed will be lessened because this type of education will ensure transparency in financial management among business owners and subsequent transfer to public life. Transparency will naturally become a living principle which will consequently be a culture in the more unruly sector of the economy, and national development will become an assured project" (Ekong, 2008).

Imparting entrepreneurial skills to college students elevates the socioeconomic and environmental context for fostering sustainable national development, shedding light on this crucial aspect. Providing employment opportunities for Nigerian graduates ensures stable national growth. Entrepreneurship education leads to the development of the beneficiaries' mental, physical, and intellectual capacities to obtain, interpret, and extrapolate information so that these capacities can be used, particularly for self-construction and national development. The nation's complex developmental issues, such as resource waste, hunger, disease control, etc., may be solved by incorporating the acquisition of entrepreneurship skills into university education. This initiative will open doors for the dormant capacities of self-actualisation and fulfilment, benefiting individuals and society. Moreover, by promoting the acquisition of entrepreneurial skills, we can significantly reduce the general ignorance and poverty that graduates might face, if not eliminate these challenges.

"The value of entrepreneurship education lies in generating jobs, promoting innovation, and creating opportunities for the country's diverse population" (Gomez-Mejia & Balkin, 2002). In their opinion, entrepreneurship begins with choosing a business idea, then drawing up a business plan, choosing the most suitable legal form to operate, raising the necessary funding, making more money, addressing growth and expansion that leads to people's involvement, and creating employees and new markets. This significantly reduces some social issues that society would have been dealing with. "Increasing the value of local resources, advancing technology, increasing capital formation and investment, and fostering an entrepreneurial culture are all advantages of entrepreneurship" (Manu et al., 2005). Integrating entrepreneurship education into university curricula aims to cultivate a specific breed of indigenous entrepreneurs. These individuals should be able to initiate and manage businesses, ultimately leading to job creation, production of goods and services, generating profits, and overall advancement in national development. SMEs positively affect Indian society and speed up the nation's development in many ways. They may develop by motivating students at various educational levels in the nation. Engaging in small business activities brings forth significant social benefits, such as revitalising traditional or indigenous industries, promoting indigenous entrepreneurship and technology, creating job opportunities, and aiding in the redistribution of wealth and income within a society.

A key obstacle to entrepreneurship education is the lack of motivation and specialised training among teachers. Teachers' practice-oriented activities, sometimes outside regular working hours, are not recognised as an official mandate. "In many universities, general studies departments frequently house entrepreneurship skill acquisition courses taught by lecturers who lack the basic training in entrepreneurship education and cannot thus impart the knowledge effectively. Only properly qualified teachers can comprehend and impart entrepreneurial subject matter in a motivating way to foster entrepreneurially minded students who will achieve the country's economic goals" (Matlay, 2005).

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Materials and Methods

The survey was conducted using a questionnaire developed after a pilot study of 30 academicians, entrepreneurs, and students. The information was gathered using a questionnaire that utilised a five-point Likert scale. The Likert Scale ranged from 1 to 5, where 1 represented "Strongly Disagree" and 5 denoted "Strongly Agree." The data collection encompassed items outlined in Table 1. Ten items were used for this study. The infrastructure dimension contains three items; four items belong to the academic syllabus dimension, and three to the market exposure item.

Table 1

Items for curriculum and infrastructure development

Construct	Items
Infrastructure	a) Students' entrepreneurship activities unit b) Vocational skill acquisition unit c) Entrepreneurship research and development unit
Academic Syllabus	a) Theory (foundation and advanced) b) Thematic units c) Assignments d) Projects
Market Exposure	a) Live entrepreneur interaction b) Business/Start-up model c) Participation in competitions

The sample for this study includes academicians. Students and entrepreneurs. One hundred seventy-two forms were circulated via email. Out of 172, 104 complete responses were received. The dataset underwent an Exploratory Factor Analysis (EFA) employing principal component analysis (PCA) as the factor extraction method and varimax rotation as the rotation method. This was done to discern essential variables and significant components within the data. The number of factors and items is determined based on the following principles: i) Kaiser-Meyer-Olkin Score (KMO) test,> 0.6, ii) Significant value of Bartlett's test factor, $p < 0.001$ and iii) Factor loading for items > 0.60 (Daud et al., 2019).

Ethical protocols such as obtaining informed consent, ensuring confidentiality, and allowing participants the right to withdraw were followed

Results and Discussion

Descriptive Statistics of the Respondents

Male respondents accounted for 51.92% of the total, while female respondents comprised 48.08%, as illustrated in Table 2. Most respondents (40.38%) were in the 24–30 age range, while 26.92% and 32.69% were in the 18–24 and >30 age ranges, respectively. 47.11% of the sample were undergraduates, while 52.88% had postgraduate degrees or higher.26.92% of respondents reported having more than six years of experience, 40.38% reported having three to six years of experience, and 32.69% reported having less than three years.

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Table 2

Profile for the respondents

Profile	Number of Respondents	Percentage
Gender		
Male	54	51.92
Female	50	48.08
Age Group		
18-24 years	28	26.92
24-30 years	42	40.38
>30 years	34	32.69
Level of Education		
Undergraduate	49	47.11
Postgraduate and more	55	52.88
Work Experience		
<3 years	34	32.69
3-6 years	42	40.38
>6 years	28	26.92

Table 3 shows the ten items measured across three constructs: Infrastructure, academic syllabus and market exposure. There are three items in the infrastructure category, four in the academic syllabus category and three in the market exposure category. Market exposure category (average mean score: 3.86) was found more important than infrastructure (average mean score: 3.69) and academic syllabus (average mean score: 2.96).

The mean scores for the three items within the infrastructure construct varied from 3.60 (item IS1) to 3.82 (item IS2). Standard deviations ranged from 0.738 (IS3: 20.33 percent of 3.63) to 0.782 (IS1: 21.72 percent of 3.60), indicating proximity to the mean values.

Within the academic syllabus construct, divided into four segments, mean scores ranged from 2.70 (item AS3) to 3.59 (item AS4). Standard deviations ranged from 0.705 (AS4: 19.64 percent of 3.59) to 0.892 (AS1: 32.09 percent of 2.78), suggesting values close to the mean.

For the three items constituting the market exposure construct, mean scores ranged from 3.68 (item ME1) to 4.08 (item ME2). Standard deviations ranged from 0.706 (ME2: 17.30 percent of 4.08) to 0.827 (ME1: 22.47 percent of 3.68), indicating a tight clustering of scores around the mean.

The notable standard deviations for items resulted from the respondents' diverse backgrounds, work experiences, and education levels.

The lowest mean score is 2.70 (item AS3: Assignments), while the highest mean score is 4.08 (item ME2: Business/Start-up model). The overall mean score for the constructs is 3.45. According to the findings, all three constructs explain the items for academic curriculum and infrastructure requirements.

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Table 3

Descriptive analysis

Code	Items	Mean	Std. Dev.	Coeff. of Var.
Infrastructure				
IS1	Students' entrepreneurship activities unit	3.60	0.782	0.2172
IS2	Vocational skill acquisition unit	3.85	0.760	0.1974
IS3	Entrepreneurship research and development unit	3.63	0.738	0.2033
	All Items in Infrastructure	3.69		
Academic Syllabus				
AS1	Theory (foundation and advanced)	2.78	0.892	0.3209
AS2	Thematic units	2.75	0.773	0.2811
AS3	Assignments	2.70	0.811	0.3004
AS4	Projects	3.59	0.705	0.1964
	All Items in Academic Syllabus	2.96		
Market Exposure				
ME1	Live entrepreneur interaction	3.68	0.827	0.2247
ME2	Business/Start-up model	4.08	0.706	0.1730
ME3	Participation in competitions	3.81	0.777	0.2039
	All Items in Market Exposure	3.86		

Exploratory Factor Analysis

In the social sciences, exploratory factor analysis (EFA) is a commonly used and widely applied statistical technique (Hogarty et al., 2005). EFA is a multivariate statistical procedure used to reduce a large number of factors into a smaller set of factors, establish dimensions and provide construct validity, to name a few (Williams et al., 2010).

Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity were employed to assess the sample's validity in this study. The KMO measure helps evaluate the adequacy of the data for conducting factor analysis, providing insights into the sampling adequacy for the analysis. Bartlett's test of sphericity tests whether the observed variables in the dataset are intercorrelated, a prerequisite for conducting a meaningful factor analysis. These tests are crucial in establishing the suitability of the data for factor analysis and subsequent interpretation of the results. For the factor analysis to be appropriate, Bartlett's test of sphericity must be significant at ($P < 0.05$) (Hair et al., 2014). The KMO scale runs from 0 to 1, but anything above 0.6 is acceptable (Hoque & Zainuddin, 2016). Prior to conducting further analysis, an item extraction process was initiated to reduce the number of items to a manageable quantity by investigating the total variance explained. In this procedure, items with eigenvalues surpassing 1.0 were isolated into distinct components (Zainuddin, 2012). Subsequently, upon reviewing the rotated component matrix, only items exhibiting factor loadings above 0.6 were retained for subsequent analysis, ensuring a focused and relevant set of items for the study.

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Table 4

KMO and Bartlett's test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.879	
Bartlett's Test of Sphericity	Approx. Chi-Square	1632.748
	df	45
	Sig.	.000

KMO has a general acceptance index of 0.6 or higher. As shown in Table 4, the KMO value of 0.879 is deemed excellent, surpassing the recommended threshold of 0.6. Additionally, the Bartlett test for sphericity should have a significance level of less than 0.05 for the factor analysis to be deemed appropriate and accepted, indicating the presence of meaningful relationships between the observed variables in the dataset. The significance value of Bartlett's Test is 0.000, which is less than the required significance value of 0.05. (Zainuddin, 2012). Indeed, a KMO score exceeding 0.6 and a Bartlett's test significance score below 0.05 indicate that the dataset is suitable and appropriate for proceeding with the reduction procedure. These values confirm that the data is sufficient for conducting factor analysis and reducing the number of items while still preserving meaningful components.

Total variance explained is the process of extracting elements and reducing them to a manageable number before further analysis. In this process, components with eigenvalues exceeding 1.0 are extracted into different components (Hoque et al., 2016; Zainuddin, 2012).

Table 5

Total variance explained

Component	**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**		
	Total	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	7.185	71.846	71.846	7.185	71.846	71.846
2	1.455	14.546	86.392	1.455	14.546	86.392
3	.438	4.376	90.768			
4	.378	3.782	94.549			
5	.217	2.175	96.724			
6	.177	1.768	98.492			
7	.069	.692	99.184			
8	.041	.407	99.591			
9	.028	.282	99.873			
10	.013	.127	100.000			

The EFA has extracted two components, with eigenvalues ranging from 7.185 to 1.455, as shown in Table 5. This suggests that the items are grouped into two components, warranting further investigation and analysis to explore the underlying structure and relationships within these components. In addition, this table shows that the total variance described is 86.392 percent.

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Table 6

Rotated component matrix

	Component	
	1	2
Thematic units	.915	
Theory (foundation and advanced)	.838	
Vocational skill acquisition unit	.781	
Live entrepreneur interaction	.780	
Assignments	.778	
Business/Start-up model	.747	
Participation in competitions	.628	
Entrepreneurship research and development unit		.932
Projects		.931
Students' entrepreneurship activities unit		.924
Extraction Method: Principal Component Analysis.		
Rotation Method: Varimax with Kaiser Normalisation.		

As per Table 6, the EFA procedure yielded two components. Only factor loadings greater than 0.6 will be retained according to the study's criteria. Upon reviewing the rotated component matrix, it is clear that all ten items demonstrate factor loadings exceeding 0.6. Consequently, all ten items within the two identified components will be considered for further analysis.

Reliability Analysis of the Components

Reliability analysis is a technique for determining the degree to which all items under each construct are error-free. Cronbach's alpha is a measure of an item's reliability. However, Cronbach's alpha tolerance varies by author. For valid internal consistency reliability, Cronbach's Alpha should be greater than 0.50. (Kerlinger & Lee, 2000). Cronbach's Alpha of 0.60 or higher indicates that the instrument has a high level of internal consistency, while 0.70 indicates a high-reliability level (Hoque et al., 2018). A Cronbach's Alpha minimum threshold of 0.60 is deemed acceptable in this study. The Cronbach's alpha values obtained for each component are displayed in Table 7. The outcomes demonstrate that all reliability measures for the two components exceed the stipulated threshold of 0.60, affirming the internal consistency and reliability of the measured constructs in this study.

Table 7

Reliability statistics for the two extracted components

Components	No. of Items	Cronbach's Alpha
Component 1	7	0.855
Component 2	3	0.865

Naming the Components

The extracted factors need to have names that make sense. Using the top one or two loading items for each factor is one method of factor naming. An adequately labelled factor gives an accurate, helpful description of the underlying construct, which improves the report's clarity. Table 8 shows the components' names based on the variables under each component.

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Table 8

Naming the components

Component	Variables	Name of the Component
Component 1	Thematic units	Thematic Theory
	Theory (foundation and advanced)	
	Vocational skill acquisition unit	
	Live entrepreneur interaction	
	Assignments	
	Business/Start-up model	
	Participation in competitions	
Component 2	Entrepreneurship research and development unit	Entrepreneurship Development Cell
	Projects	
	Students' entrepreneurship activities unit	

The robustness and credibility of any research study depend significantly on the data collection protocols and ethical considerations that guide the research process. In this study, the systematic approach employed in data gathering ensures that the data accurately reflect the intended population, while ethical rigour protects the rights and dignity of the respondents.

A well-designed data collection process begins with creating valid and reliable instruments. Pre-testing (pilot studies) and standardised procedures help reduce measurement error and bias, ensuring that the data truly represent the constructs of interest (Creswell, 2013). Sampling techniques—random, stratified, or purposive—are carefully chosen to achieve a representative sample, which is crucial for the generalizability of research findings. These protocols enhance the study's accuracy and build the foundation for sound statistical analysis.

Ethical considerations are equally important. Obtaining informed consent is a fundamental prerequisite, ensuring that respondents are fully aware of the study's purpose, their role, potential risks, and benefits. This process respects participants' autonomy and builds trust between the researcher and the respondents (Orb et al., 2001). Protecting the confidentiality and anonymity of participant data is another critical ethical requirement. Secure data storage and proper data handling practices help maintain privacy, further enhancing the reliability of the responses and the overall trustworthiness of the study.

Special attention must also be given to vulnerable populations. When researching groups with limited decision-making capacity, extra safeguards are necessary to prevent exploitation and ensure that these participants are not unduly burdened or harmed. According to Israel and Hay (2006), such extra precautions are critical in upholding ethical standards in social research, ensuring that the welfare of all participants is prioritised.

The advent of digital technology in data collection, through online surveys, electronic questionnaires, or digital interviews, offers increased efficiency and broader reach. However, it also introduces new ethical challenges such as data security and ensuring respondent privacy (Saunders et al., 2019). To protect sensitive information, researchers must ensure that digital platforms comply with ethical guidelines, including encrypted communication and secure storage systems.

Integrating rigorous data collection protocols with strict ethical practices is essential for generating valid and reliable research outcomes. These measures ensure that the study meets methodological standards and upholds the moral integrity of the research process. Future research should continue to refine these protocols, adapting to emerging digital tools while maintaining ethical vigilance. Such an approach will enhance the quality and impact of academic research by fostering an environment of trust and scientific excellence.

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Conclusion and Suggestions

Academic experts are constantly debating the teaching-learning methodologies and curricula for entrepreneurship education. Some claim that entrepreneurship education should primarily concentrate on practical components with less traditional classroom approaches that overwhelm the students with theoretical and conceptual content. However, in teaching entrepreneurship, it is essential to use methods such as lectures, assignments, class discussions, guest speakers, video clips, one-on-one coaching, role-plays, team teaching, and teamwork. The goal of spreading knowledge and developing potential entrepreneurial skills can be successful if these techniques are applied. Specific entrepreneurial skills are believed to be best absorbed when students invent new businesses. The entrepreneurial curricula at esteemed business schools like Babson College, Stanford Business School, Massachusetts Institute of Technology, Sloan School of Management, London Business School, and Cambridge University Judge School of Business are characterised by entrepreneurial frameworks emphasising behavioural learning methods. These institutions utilise teaching and learning activities beyond traditional classrooms, such as internships at start-ups, on-campus small business ventures, and small consulting engagements. The objective is to immerse students in experiences that align with the realities of entrepreneurship and foster their development as genuine entrepreneurs. These institutions do assert that a large number of graduates start their businesses right away.

The research outlined in this paper has certain limitations. The questionnaire did not delve into respondents' perspectives on student competitions, university-private sector collaborations, and other hands-on learning activities. Nevertheless, despite these limitations, this paper contributes significantly to entrepreneurship education research by presenting valuable recommendations for its future direction and development. More specifically, the current study includes some recommendations for university elements that might boost respondents' interest in entrepreneurship, for developing entrepreneurial skills in the classroom, and for extracurricular activities to advance knowledge in this area. A continuing body of research on this subject would assist educators in better understanding what is expected of young people in this regard and identify strategies for fostering a more entrepreneurial mindset in youth.

Author contribution statement

Hitesh Tripathi: Conceptualization, methodology, data analysis and writing. **Gyanendra B. S. Johri:** Conceptualization, data analysis and writing. **Pradeep Kumar Srivastava:** Conceptualization, data analysis, writing and project administration. **Sharad Srivastava:** Conceptualization, Data analysis and writing. All author(s) involved in addressing the comments, revision of the paper and finalization of manuscript.

Funding

There is no funding support for this study.

Declaration statement

The authors declare no conflict of interest.

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JBM
The Journal of Business and Management
(B category academic journal as per UGC Nepal classification)

ISSN 2350-8868
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Impact of Cognitive Bias on the Use of Management Information Systems in Nepalese Commercial Banks

Shankar Nath Adhikari*

*Atlantic International College, Pokhara University, Kathmandu, Nepal

Received: 7 March 2025
Reviewed: 15 May 2025
Accepted: 30 May 2025
Published: 30 June 2025

Correspondence:
Shankar Nath Adhikari
adhikari.shankarnath@gmail.com

Citation:
Adhikari, S. N. (2025). Impact of cognitive bias on the use of management information systems in Nepalese commercial banks. *The Journal of Business and Management, 9*(1), 59-72. https://doi.org/10.3126/jbm.v9iI.81194

Abstract

Background: Management Information Systems (MIS) play a critical role in enhancing decision-making and operational efficiency in the banking sector. However, the effectiveness of these systems is often undermined by cognitive biases that distort how individuals process and respond to system-generated information. In the context of Nepalese commercial banks, where MIS adoption is increasing, the role of cognitive bias remains underexplored and insufficiently addressed in both research and practice.

Objectives: This study aims to investigate the extent to which cognitive biases anchoring bias, overconfidence bias, loss aversion, and confirmation bias impact the use and effectiveness of MIS in Nepalese commercial banks. The goal is to identify how these psychological factors influence user interaction with MIS and their subsequent decisions.

Methods: A quantitative descriptive-correlational research design was used, employing a structured 23 item questionnaire based on validated constructs. A purposive sample of 571 participants, 371 banking customers and 200 employees from Nepalese commercial banks was selected to gather diverse perspectives on MIS usage and cognitive biases. Data analysis involved SPSS 26.0 for descriptive statistics and AMOS 26.0 for confirmatory factor analysis (CFA) and structural equation modeling (SEM) to evaluate model fit and test the hypothesized relationships between cognitive biases and MIS utilization.

Results: The study found that cognitive biases limit the effective use of MIS. Overconfidence, anchoring, loss aversion, and confirmation bias affect user decisions. These biases lead to ignored alerts, trust on early data, fear of change, and resistance to updates.

Conclusion: Cognitive biases are critical impairments to MIS effectiveness in Nepalese commercial banks. Addressing these through targeted training, cognitive debiasing, and user-centric system design is essential to promote rational decision-making and optimize MIS utility.

Keywords: Cognitive biases, decision-making, management information systems, Nepalese commercial banks, user interaction

JEL Classification: G21, M15, D83, C38, O33

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Introduction

Management Information Systems (MIS) play a dynamic role in contemporary banking operations by enhancing operational efficiency, improving customer service, and supporting data-driven decision-making. In Nepalese commercial banks, MIS integrates core banking functions such as tracking financial transactions through Core Banking Systems (CBS), producing regulatory compliance reports, monitoring loan performance and credit risk, and enabling strategic decision-making through real-time data dashboards and analytics (Adhikari & Karki, 2020; Bhattarai, 2020). These systems represent the backbone of data-driven banking services, especially in an environment characterized by increasing competition, regulatory scrutiny, and rapid technological change.

Despite these technological advancements and the growing adoption of MIS, the expected improvements in decision quality and operational effectiveness are often compromised by human cognitive limitations. Behavioral factors, particularly cognitive biases, play a significant role in influencing how bank managers and staff interpret, trust, and act upon the information generated by MIS. Cognitive biases are systematic deviations from rational judgment, including phenomena such as anchoring bias, overconfidence, confirmation bias, and loss aversion (Simon & Groves, 2021; Tversky & Kahneman, 2019). These biases can cause users to misinterpret data, discount warnings, or selectively attend to information that confirms pre-existing beliefs, thereby diminishing the value and reliability of MIS outputs. For instance, an anchoring bias may cause decision-makers to extremely depend on the first set of information received, ignoring subsequent updates and warnings from MIS, while overconfidence may lead to the dismissal of risk indicators generated by the system.

To better understand these behavioral effects, this study adopts Prospect Theory as its theoretical foundation (Kahneman & Tversky, 1979). Prospect Theory explains how individuals evaluate potential gains and losses in decision-making under uncertainty, often departing from purely rational models by presenting loss aversion and framing effects. These behavioral tendencies are particularly relevant in banking, where decisions frequently involve uncertain outcomes and risk assessments based on MIS data. By framing cognitive biases through Prospect Theory, the study aims to disclose how these psychological patterns influence the use and effectiveness of MIS in Nepalese commercial banks.

In the specific context of Nepal's banking sector, cognitive biases may clear in various ways, such as an excessive trust on historical loan performance data (anchoring bias), reluctance to respond to early risk signals flagged by MIS (overconfidence), or hesitancy to take necessary risks suggested by system analysis due to fear of losses (loss aversion). Such tendencies undermine the decision-support role of MIS and can lead to inefficiencies in critical banking functions, including risk management, regulatory compliance, and strategic planning (Chaudhary et al., 2020; Ghimire et al., 2021; Sharma & Shrestha, 2020). Despite the critical importance of these issues, existing research in Nepal has largely focused on technological and organizational factors influencing MIS adoption, with the behavioral dimension especially cognitive biases remaining underexplored.

This study attempts to fill this research gap by investigating how specific cognitive biases affect the effective utilization of MIS in Nepalese commercial banks. The objective is to comprehensively assess the influence of anchoring bias, overconfidence, confirmation bias, and loss aversion on managerial interactions with MIS-generated data and recommendations. By integrating concepts from behavioral economics with information systems research, the study intends to provide actionable insights that can guide the design of MIS interfaces, training programs, and managerial practices aimed at minimizing the adverse impacts of these biases. Ultimately, such efforts can enhance decision quality, improve risk management, and promote more effective and sustainable banking operations.

To achieve these aims, a quantitative research approach employing a structured questionnaire will be

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utilized, targeting managerial and technical staff in Nepalese commercial banks who regularly use MIS for decision-making. The questionnaire will explore demographic variables, the extent of MIS use, and agreement with statements reflecting the presence of cognitive biases. The collected data has been analyzed using statistical methods to identify significant relationships between biases and MIS utilization patterns, thereby clarifying behavioral barriers to optimal system use.

The findings of this research are anticipated to contribute both theoretically and practically. Theoretically, the study extends the application of Prospect Theory into the domain of information systems within the banking sector in Nepal, highlighting the relevance of cognitive biases in technological adoption and use. Practically, the insights gained will aid banks in implementing bias-aware MIS designs and developing training and governance frameworks that promote rational decision-making. By mitigating the distortive effects of cognitive biases, banks can enhance the reliability of MIS outputs, reduce operational risks, and adapt to a culture of data-driven management. This approach aligns with global best practices emphasizing the integration of human factors in technology utilization to achieve sustainable organizational performance.

Understanding the influence of cognitive biases on the use of Management Information Systems in Nepalese commercial banks is essential for bridging the gap between technological capabilities and actual organizational performance. Addressing these behavioral challenges enables banks to optimize the value of MIS investments, enhance decision-making accuracy, and improve their ability to manage risks and fulfill regulatory demands. As the banking environment becomes increasingly dynamic and data-driven, aligning human behavior with technological systems is energetic for achieving strategic agility, operational efficiency, and long-term sustainability.

Review of Literature

Management Information Systems in Banking

MIS serves a strategic role in modern banking institutions by supporting decision-making, risk management, regulatory compliance, customer relationship management, and strategic planning (Laudon & Laudon, 2020; O'Brien & Marakas, 2011). These systems enable real-time data processing and monitoring, enhancing operational agility and competitive advantage in an increasingly digital environment (Gupta & Kohli, 2006). In Nepalese commercial banks, MIS has become essential to handle complex financial operations, improve service delivery, and fulfill evolving regulations (Adhikari et al., 2022). However, the efficacy of MIS depends not only on its technical capabilities but also on the behavioral responses of users interpreting the system's output.

Cognitive Biases and Decision-Making

Cognitive biases represent systematic deviations from rational judgment and decision-making (Tversky & Kahneman, 1974). These biases are particularly relevant in financial decision contexts characterized by uncertainty and risk (Barberis & Thaler, 2003; Kahneman & Tversky, 1979). Prospect Theory, proposed by Kahneman and Tversky (1979), explains how individuals evaluate potential gains and losses asymmetrically, often placing greater weight on avoiding losses than acquiring gains. Such biases can undermine the objectivity of decisions based on MIS data. Recent studies emphasize the importance of incorporating behavioral insights into information systems design to improve technology adoption and utilization (Bhattacherjee, 2001; Gefen et al., 2003).

Anchoring and Overconfidence Bias

Anchoring bias occurs when decision-makers excessively rely on initial information or reference points when making subsequent judgments (Tversky & Kahneman, 1974). Within MIS use, this bias may cause managers to cling to outdated performance data or early risk assessments despite updated system reports

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suggesting otherwise (Sharma & Shrestha, 2020). Overconfidence bias, defined as an inflated belief in one's own knowledge or predictive ability, often leads managers to discount MIS recommendations and depend heavily on intuition (Klayman et al., 1999; Moore & Healy, 2008). Research shows that overconfidence is prevalent among experienced professionals and can result in forecasting errors and risk mismanagement (Dhungana et al., 2022; Hilary & Menzly, 2006).

Loss Aversion and Confirmation Bias

Loss aversion refers to the tendency to prefer avoiding losses over acquiring equivalent gains (Kahneman & Tversky, 1979). In banking, this bias may cause decision-makers to hesitate acting on MIS risk alerts due to fear of reputational or financial damage, even when early intervention is warranted (Tversky & Kahneman, 1991). Confirmation bias leads users to favor information that confirms existing beliefs while disregarding contradictory MIS data (Nickerson, 1998; Oswald & Grosjean, 2004). This bias can cause defective assumptions within organizational cultures and reduce the effectiveness of MIS outputs.

Empirical Gaps in MIS and Cognitive Bias Research

Despite strong theoretical foundations, empirical studies investigating the impact of cognitive biases on MIS utilization in developing countries, including Nepal, remain limited. While international literature addresses behavioral factors in technology adoption and decision support (Arnott, 2006; Davis, 1989; Venkatesh et al., 2003), Nepalese studies largely focus on infrastructure, user training, and organizational readiness (Adhikari et al., 2022; Gautam et al., 2023). The behavioral dimensions of MIS use, particularly how cognitive biases influence decision-making in banking operations like loan approvals and risk management, are underexplored, enlightening a significant knowledge gap.

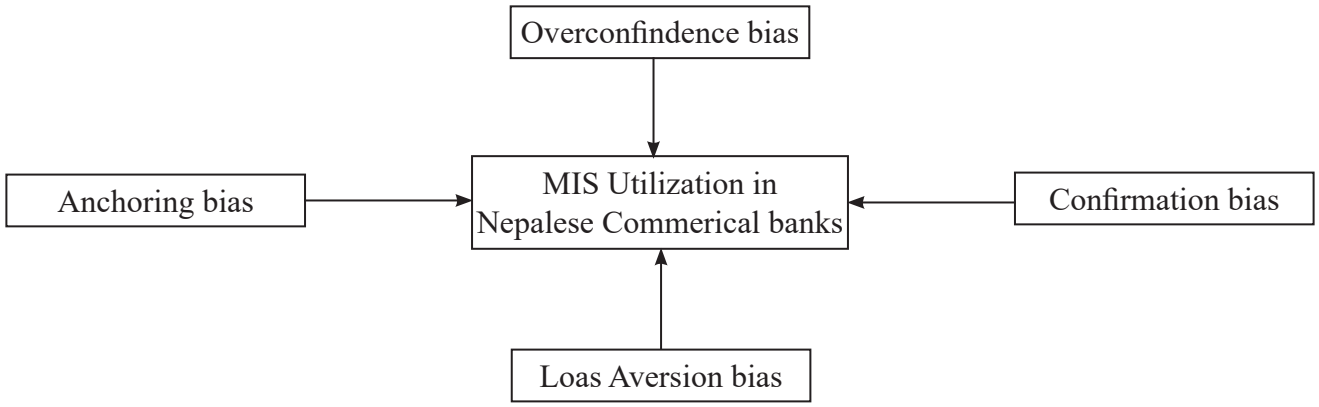
Theoretical Framework: Prospect Theory and MIS Use

The current study draws on Prospect Theory to develop a conceptual framework linking cognitive biases and MIS utilization. This framework suggests that while MIS delivers objective, data-driven recommendations, cognitive biases moderate user responses. Anchoring bias may inhibit adjustment to new information; overconfidence may lower trust in MIS outputs; loss aversion may delay critical risk responses; and confirmation bias may distort data interpretation (Chen, Xu, & Zhang, 2022; Kahneman & Tversky, 1979; Karmacharya et al., 2022). Such a behavioral-technology interaction model helps to explain challenges in achieving effective MIS-supported decision-making in financial institutions (Sarmah et al., 2021).

Conceptual Framework

Figure 1

Conceptual framework developed by the researcher based on prospect theory



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Hypothesis

H0: Cognitive biases negatively influence the effective use of MIS in decision-making processes within Nepalese commercial banks.

Some specific hypotheses are derived from the overall hypothesis to examine how individual cognitive biases influence the effective use of Management Information Systems (MIS) in Nepalese commercial banks. These specific hypotheses target distinct behavioral tendencies that may interfere with data-driven decision-making processes.

H01: Anchoring bias negatively affects the effective utilization of MIS in Nepalese commercial banks.

H02: Overconfidence bias reduces reliance on MIS outputs among managers in Nepalese commercial banks.

H03: Loss aversion bias negatively impacts timely and optimal risk-based decision-making, even when MIS provide accurate recommendations in Nepalese commercial banks.

H04: Confirmation bias distorts the interpretation of MIS information, reinforcing pre-existing beliefs in Nepalese commercial banks.

Research Design

Study Design

This quantitative research employed a cross-sectional survey to investigate the impact of cognitive biases on the use of MIS in Nepalese commercial banks. Using a causal-comparative approach, the study focused on biases such as anchoring, overconfidence, loss aversion, and confirmation bias. Structural Equation Modeling (SEM) was applied to analyze the relationships among these variables (Creswell, 2014; Hair et al., 2010).

Population and Sample

The population targeted two primary groups: commercial bank customers actively using electronic banking services and bank employees including branch managers, IT staff, and operational personnel, given their direct interaction with MIS. This dual sampling enables capturing both user and provider perspectives on MIS usage. The total sample comprised 571 participants among them 371 customers and 200 employees, which satisfies the recommended minimum sample size for SEM analyses, generally suggested as at least 200 cases or a ratio of 10 respondents per estimated parameter (Hair et al., 2010; Kline, 2015).

Sampling Technique

Convenience sampling, a non-probability technique, was used due to resource constraints and accessibility considerations. This method is widely employed in behavioral and MIS research where randomized sampling is difficult, and it allows rapid data collection from available respondents (Etikan et al., 2016). Although convenience sampling limits generalizability, its pragmatic use is justified given the exploratory nature of this study and focus on readily accessible participants.

Data Collection Procedure and Ethical Considerations

Data were collected using self-administered questionnaires distributed both physically and electronically from January to March 2025. The survey captured cognitive bias and MIS usage data through standardized items. Ethical protocols were strictly followed: participants received full explanations of the study purpose, voluntary participation was emphasized, informed consent was obtained, and confidentiality ensured by omitting personal identifiers. Ethical clearance was granted by the affiliated

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academic institution, aligning with standard research ethics guidelines (Resnik, 2018).

Measures

The instrument consisted of 18 Likert-scale items (1 = Strongly Disagree to 5 = Strongly Agree) adapted from validated scales in behavioral economics and MIS research. The constructs measured were anchoring bias (4 items), overconfidence bias (3 items), loss aversion (3 items), confirmation bias (3 items), and use of MIS (5 items). These items were coded as AB1–AB4, OB1–OB3, LB1–LB3, CB1–CB3, and UMI1–UMI5, respectively. Adapting established scales ensures content validity and comparability with prior research (Podsakoff et al., 2003).

Instrument Validity and Reliability

A pilot test with 30 participants assessed instrument reliability and clarity. Cronbach's Alpha values for all constructs exceeded 0.70, indicating good internal consistency (Nunnally & Bernstein, 1994). Confirmatory Factor Analysis (CFA) was performed to verify construct validity, confirming that items loaded appropriately onto their respective latent variables. Revisions were made based on expert feedback from academics and banking professionals to enhance clarity and contextual relevance.

Data Analysis Techniques

Data analysis was conducted using SPSS version 26.0 and AMOS version 26.0. Descriptive statistics (frequencies, means, and standard deviations) summarized respondent characteristics and general trends. SEM tested the hypothesized relationships, enabling simultaneous analysis of direct and indirect effects among latent variables. Model fit was evaluated using standard indices including the Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA), and Goodness-of-Fit Index (GFI), following accepted SEM reporting standards (Hu & Bentler, 1999).

Results and Discussion

Demographic Data Analysis

Table 1 shows that 57.2% of respondents were male, and 42.8% were female. The largest age group was 25–35 years (45.4%), followed by 35–50 years (36.4%). Most respondents (66.0%) reported using MIS daily, while 31.7% used it weekly, and 2.3% monthly.

Regarding banking experience, 55.4% had 2–5 years of experience, indicating a relatively young and experienced workforce. Additionally, 57.8% reported operational-level ICT knowledge, while only 0.3% had minimal exposure, suggesting that most respondents were sufficiently skilled to use MIS effectively.

Table 1

Socio-demographic characteristics of respondents (N = 571)

	Characteristics	N	%
Gender			
	Male	327	57.2
	Female	244	72.8
Age			
	Below 25 Years	47	8.2
	25-35 years	259	45.4
	35-50 years	208	36.4
	More than 50 years	57	10.0

Frequency of MIS Uses		
Daily	377	66.0
Weekly	181	31.69
Monthly	13	2.31
Banking Experience		
Below 2 years	53	9.2
2-5 years	316	55.4
5-8 years	171	30.4
More than 8 years	29	5.0
ICT Knowledge		
Few	2	0.3
Basic	122	21.4
Operational	330	57.8
High	117	20.5

Note. Based on field survey conducted by the researcher (January–March 2025).

An 18-item five-point Likert scale (1 = strongly agree to 5 = strongly disagree) was used to assess cognitive biases and the use of MIS. Table 2 describes the mean values for all items which were below 3.0, suggesting a general agreement among respondents with the presented statements (Awang, 2012). According to Norman (2010), Likert-scale means below the midpoint indicates agreement and supports the interpretation of behavioral tendencies. Furthermore, the cognitive bias constructs anchoring, overconfidence, confirmation bias, and loss aversion used in this study are grounded in well-established behavioral theory (Kahneman, 2011), reinforcing their relevance in evaluating MIS usage behavior.

Table 2

Factors affecting the use of MIS

Items	**Mean**	**Std. Deviation**
Anchoring Bias		
AB1. People trust too much on the first information they receive.	1.981	0.627
AB2. Even when MIS provides better data, they hesitate to change	1.635	0.712
AB3. Avoids new technology or methods.	1.572	0.688
AB4. They trust old ways instead of updating their thinking based on new reports.	2.081	0.612
Overconfidence Bias		
OB1. People believe their own judgment is better than what MIS suggests.	1.567	0.732
OB2. They ignore warnings or reports from MIS, thinking they don't need them	1.782	0.691
OB3. They prefer making decisions based on experience rather than data.	1.810	0.701
Loss Aversion		
LB1. People avoid new MIS features because they fear losing control.	2.211	0.813
LB2. Even when MIS shows a better way, they stick to familiar methods.	1.891	0.802
LB3. They feel safer with manual processes rather than trusting digital tools.	1.991	0.765
Confirmation Bias		

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CB1. People focus only on MIS reports that support what they already believe.	2.001	0.821
CB2. They ignore or avoid data that challenges their views.	2.121	0.792
CB3. Instead of using MIS to explore all options, they pick only what fits their thinking.	1.78	0.871
Use of MIS		
UMI1. MIS gathers relevant data from various sources for informed decision-making.	1.881	0.761
UMI2. MIS centralizes data storage, ensuring easy access and consistency across departments.	1.781	0.771
UMI3. It provides real-time updates, enabling quick actions based on current information.	1.710	0.841
UMI4. MIS supports decision-making by offering insights and analysis to managers.	1.563	0.734
UMI5. It automates routine tasks, improving efficiency and reducing errors.	1.991	0.804
N=571, 1=Strongly Agree, 2= Agree, 3=Neutral, 4= Disagree, 5= Strongly Disagree		

Note. Field survey by researcher (Jan–Mar 2025) and SPSS analysis.

Confirmatory Factor Analysis (CFA)

CFA is a method within SEM and factor analysis that assesses whether observed variables align with latent or unobserved variables. This study aims to determine how factors such as anchoring bias, loss aversion bias, overconfidence bias and confirmation bias influence the use of management information system.

To achieve this, the research surveyed 571 individuals from various banks. The questionnaire covered all relevant factors. Factor analysis, used to reduce a large number of variables into a manageable set of factors, was employed in this study. Prior to conducting CFA, prerequisites such as multivariate normality, multicollinearity, and sample size were carefully examined.

Reliability and Validity Analysis

In principle, reliability and validity are interconnected concepts. The construct validity of all constructs was assessed using Confirmatory Factor Analysis (CFA). Construct validity comprises two key types of validity - discriminant validity ensures constructs are distinct, while convergent validity confirms they accurately measure what they are intended to.

Table 3

Reliability and convergent validity

Items	Alpha	Composite Reliability	AVE
Anchoring Bias	.925	.833	.625
Loss Aversion	.959	.956	.887
Overconfidence Bias	.935	.929	.815
Confirmation Bias	.828	.937	.834
Use of MIS	.831	.956	.876

Average Variance Extracted (AVE): AVE measures convergent validity, reflecting how well a construct shares its items or statements. For all variables, the AVE values exceed 0.5: Anchoring Bias = 0.625, Loss Aversion = 0.887, Overconfidence Bias = 0.815, Confirmation Bias = 0.834 and Use of MIS =

0.876. This indicates that the model demonstrates convergent validity.

Composite Reliability (CR): CR evaluates the significance of items by examining factor loadings. The CR values for all constructs are above 0.7: Anchoring Bias = 0.833, Loss Aversion = 0.956, Overconfidence Bias = 0.929, Confirmation Bias = 0.937 and Use of MIS = 0.956. This confirms the composite reliability of the model.

Internal Consistency: Internal consistency assesses how well a factor is related to other factors, typically measured using Cronbach's alpha. All variables have Cronbach's alpha values exceeding 0.7: Anchoring Bias = 0.925, Loss Aversion = 0.959, Overconfident Bias = 0.935, Confirmation Bias = 0.828 and use of MIS = 0.831. This indicates strong internal consistency within the model.

Discriminant validity in the study was evaluated using two methods: the Fornell and Larcker Criterion and the Heterotrait-Monotrait (HTMT) Ratio. According to the Fornell and Larcker Criterion, discriminant validity is confirmed if the square root of the Average Variance Extracted (AVE) for a construct is greater than its correlation with other constructs. However, this criterion has faced criticism, and the HTMT Ratio has become a more widely accepted method for assessing discriminant validity. In this study, discriminant validity was not fully established using the Fornell and Larcker Criterion. Nevertheless, the HTMT Ratio analysis showed that all ratios were below the recommended threshold of 0.85 (Henseler et al., 2015), indicating that discriminant validity was achieved. The results of the discriminant validity assessment are summarized in Table 4.

Table 4

HTMT analysis

	F4	F5	F9	F10
F4				
F5	0.427			
F9	0.478	0.464		
F10	0.426	0.404	0.674	

Thus, with all the reliability and validity criteria met, the confirmatory factor analysis model is deemed effective for evaluating the contribution of the factors in assessing the impact of cognitive bias on the use of MIS.

CFA Model Fit

The fit statistics referring to this measurement model showed adequate fit represented by values of 0.9 or above for NFI, TLI, CFI and less than 0.8 for RMSEA (Bagozzi &Yi, 1998). The chi- square of this model was 315.492, at DF of 119 (p=0.00), also indicative of data fit. Chi-square / degrees of freedom are represented by the value 2.91, which is less than 5.0. Other less favorable indicators were GFI=.915 and AGFI= .902, which were greater than 0.9. Therefore, the goodness of fit statistics illustrated that the structural model fitted well with the data.

Significance testing Using SEM

The structural model represents the second stage and final step in the SEM approach. This model

integrates and correlates all the factors with the use of MIS constructs. It establishes a structural link between the cognitive bias and the use of MIS. The fit statistics referring to this measurement model showed adequate fit represented by values of 0.9 or above for NFI, TLI, CFI and less than 0.8 for RMSEA (Bagozzi &Yi, 1998). The chi- square of this model was 314.569, at DF of 119 (p=0.00), also indicative of data fit. Chi-square / degrees of freedom are represented by the value of 2.643, which is less than 5.0. Other less favorable indicators were GFI=.981 and AGFI= .975, which were greater than 0.9. Therefore, the goodness of fit statistics illustrated that the structural model fitted well with the data.

Hypothesis Testing

SEM using AMOS was employed to test the hypothesized relationships between cognitive biases and the use of MIS in Nepalese commercial banks. Table 6 presents the standardized path coefficients, standard errors (S.E.), critical ratios (C.R.), and p-values for each relationship.

Table 5

Path coefficients from SEM analysis

Variable			Estimate	S.E.	C.R.	P	Remarks
Use of MIS	<---	Anchoring Bias	.270	.042	4.538	***	Significance
Use of MIS	<---	Overconfidence Bias	.206	.027	5.469	***	Significance
Use of MIS	<---	Loss Aversion	.115	.039	2.092	.036	Significance
Use of MIS	<---	Confirmation Bias	0.231	.049	3.142	0.012	Significance

All four cognitive biases demonstrated statistically significant effects on MIS use. The p-values for each relationship were below the 0.05 significance threshold, indicating the rejection of the null hypotheses (H1–H4). Furthermore, the critical ratios (z-scores) for each bias exceeded the threshold value of 1.96, supporting the statistical significance of these effects.

This study explored the impact of four cognitive biases—anchoring bias, overconfidence bias, loss aversion, and confirmation bias—on the use of Management Information Systems (MIS) within Nepalese commercial banks. Using Structural Equation Modeling (SEM), the findings reveal that each of these biases significantly affect MIS usage, highlighting the role of human cognition in shaping digital decision-making practices.

Anchoring bias showed the strongest positive effect on MIS use ($\beta = 0.270$, $p < 0.001$), indicating that users often rely heavily on initial information, such as default MIS inputs or historical data, even when more relevant or recent data is available. This behavior supports earlier cognitive theories (Tversky & Kahneman, 1974) and justifies the need to address rigid decision anchors within MIS environments.

Confirmation bias was also influential ($\beta = 0.231$, $p = 0.012$), suggesting users interpret information selectively to confirm their pre-existing beliefs. This bias can hinder objective analysis, particularly in data-rich environments like MIS, and supports Nickerson's (1998) claim that people often seek cognitive consistency at the expense of accuracy.

Overconfidence bias ($\beta = 0.206$, $p < 0.001$) reveals that users may overly trust their interpretations of MIS data, ignoring limitations or contrary evidence. This behavior aligns with Moore and Healy's (2008) findings, reinforcing the importance of improving users' self-awareness and critical thinking in MIS settings.

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Although weaker in magnitude, loss aversion ($\beta = 0.115$, $p = 0.036$) was statistically significant, indicating that risk-averse users may avoid certain MIS features to prevent perceived losses. This reflects the foundational work of Kahneman and Tversky (1979) and suggests that loss-sensitive users might underutilize analytical tools that could otherwise benefit decision-making.

Conclusion and Suggestions

This study confirms that cognitive biases significantly impact the use of MIS in Nepalese commercial banks. Decision-makers are influenced by psychological tendencies rather than purely rational thinking when engaging with MIS. Among the biases examined, anchoring and confirmation biases have the strongest effects, followed by overconfidence and loss aversion. These biases constrain the effective use of MIS, leading to best decisions and underutilization of technological capabilities. Therefore, MIS effectiveness depends not only on technical factors but also on recognizing and addressing users' cognitive limitations. Integrating behavioral awareness into MIS implementation and user training is essential to enhance the value derived from MIS investments.

To mitigate these challenges, organizations should incorporate behavioral science modules in MIS training programs to increase awareness of cognitive biases and encourage rational decision-making. MIS interfaces should be designed to minimize anchoring and confirmation biases by providing balanced information, highlighting updates, and encouraging different viewpoints. Organizations must adopt a culture that promotes critical evaluation of MIS outputs through questioning assumptions, validating data, and consulting multiple sources to reduce overconfidence. Establishing familiar environments will allow users to safely explore MIS features, reducing loss aversion and increasing familiarity with system capabilities. Moreover, banking regulators and policymakers should formulate guidelines that integrate behavioral insights to improve system governance and user accountability. Further research linking cognitive psychology and MIS in emerging economies is important to improve how these systems are designed, adopted, and used.

Author contribution statement

The author solely conducted conceptualization, data collection, analysis, writing tasks, addressing the comments of reviewers, and finalizing the manuscript.

Funding

There is no funding support for this study.

Declaration statement

The authors declare no conflict of interest.

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JBM
The Journal of Business and Management
(B category academic journal as per UGC Nepal classification)

ISSN 2350-8868
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Macroeconomic Variables and Common Stock Returns in Nepalese Capital Market

Shiva Raj Poudel*

*Far Western University, Kanchanpur, Nepal

Received: 30 March 2025
Reviewed: 14 April 2025
Accepted: 27 May 2025
Published: 30 June 2025

Correspondence:
Shiva Raj Poudel
shivapoudyal@gmail.com

Citation:
Poudel, S. R. (2025). Macroeconomic variables and common stock returns in Nepalese capital market. *The Journal of Business and Management, 9*(1), 73-87. https://doi.org/10.3126/jbm.v9iI.81186

Abstract

Background: Capital Assets Pricing Model (CAPM) advocates the single predictive power of stock beta and argued that stock beta is only the factor which measure common stock returns to the extent on which the asset is corelated. However, Arbitrage Pricing Theory (APT) confirmed the multifactor effect on common stock returns. Therefore, the expected returns from the market can be the product of firm performance and the overall economy of the country.

Objectives: The primary goal of the study is to examine how macroeconomic variables effect on the cross-section of expected stock returns in Nepali capital market.

Methods: The study is based on data collected from 48 firms listed on the Nepal Stock Exchange (NEPSE), covering a 12-year period from 2010/11 to 2021/22, with total 576 observations. The dependent variables considered are capital gain yield, dividend yield, and total yield. Likewise, the explanatory variables are macro-economic variables such as GDP growth rate, consumer price index, money supply, Government Treasury bills and the lending rate. The analysis tools consist of descriptive statistics, correlation, and regression analysis.

Results: The findings confirm that GDP growth, consumer price index, and money supply positively affect stock returns. In contrast, Treasury bills and lending rate have significant negative impact on common stock returns in Nepali stock market. The results obtained from the all-samples group were re-examined by stratified sample groups and confirmed the consistent results in almost all of the models applied.

Conclusion: Macroeconomic variables are the key factors in predicting stock returns in Nepali capital market. Therefore, all the policy makers and investors practicing in Nepali capital market must analyze the economic condition of the country while taking important decisions.

Keywords: Common stock returns, consumer price index, GDP growth, macroeconomic variables, money supply

JEL Classification: E00, G10, G11, G12

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Introduction

Since the seminal publication of Portfolio Selection Theory (Markowitz, 1952), many discussions and empirical studies have been conducted to determine the common stock returns. In CAPM, Sharpe (1964), Lintner (1965), and Black (1972) advocate on the single predictive power of stock beta. Stock beta is only the factor which can measure the common stock return to the extent on which the asset is corelated. However, some of the major empirical studies confirmed the multifactor relationship of common stock returns. For example, Arbitrage Pricing Theory (APT) of Rose (1976), earning effect of Ball (1978), size effect of Banz (1981), three factors effect of Fama and French (1993), five factor effect of Fama and French (2015), and assets growth effect of Cooper et al. (2008).

Apart from the stock beta and fundamental variables, Chen et al. (1986) investigated the macroeconomic effect of explaining portfolio returns. The macroeconomic variables are risks that are rewarded in the stock market returns. In addition, Campbell (1987), Hamao (1988), Harvey (1989), Chen (1991), Ibrahim and Aziz (2003), and Rapach et al. (2005) examined that the macroeconomic factors such as industrial production growth rate, inflation rate, growth rate of money supply, and long-term and short-term interest rates do have significant impact in predicting portfolio returns. However, Ferson and Harvey (1999) examined the effect of macroeconomic variation on stock returns and rejected the claim of significant role of factor model of Fama and French (1993 & 2015), Treasury bills (Campbell, 1987 & Harvey, 1989) in predicting portfolio returns. Balci (2025) examined a negative impact of macro-economic risk factors and the stock returns.

Based on the literature discussions, it is confirmed that like the stock beta and firm specific fundamental variables, macroeconomic variables can also play a significant role in predicting common stock returns. However, there is still a gap in literature that shows how these macroeconomic variables affect the return from the assets of different industries group. In addition, most of these conclusions were drawn the huge capital market such as S & P 500 and Tokiyo stock exchange. Therefore, this study tries to fulfill the issues how do macro-economic variables effect on stock returns from the small capital market like Nepal.

Thus, this paper examines the casual impact of macro-economic variables on cross-sectional returns from the market to provide empirical evidence from the small capital market. This effort attempts to link and compare the findings with the existing body of literature between huge and small capital markets. Consequently, this study uses the dataset of 48 firms from the NEPSE including 576 observations covering 12 years study periods from mid-July 2011 to mid-July 2022. The impact of macro-economic variable on common stock returns is examined by using the regression analysis. Firstly, the analysis is conducted for all sample firms and the robustness of the results were examined by using the cross-sectional sample units stratified as banking, insurance, and other companies' groups.

The findings reveal that the GDP growth, money supply, consumer price index show the positive effect on the returns in most of the models used. In contrast, long-term and short-term interest rates as measured by lending rate and Government Treasury bills have the negative impact on returns in Nepali stock market.

The remaining section of the study consists of literature review, research methodology, results and discussion and finally the conclusions.

Review of Literature

Macro-economic variables are independent variables. Among them, GDP growth, consumer price index, money supply, Treasury bills rate and interest rate are taken as the macro-economic variables. The detail description and the theoretical backing for selecting these variables as independent variables for

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the study are described as follows:

Gross Domestic Product Growth (GDPG)

GDPG represents the gross domestic product growth rate. Sum of outputs of the economy is GDP. One of the major determinants of the macro-economic factor on common stock return is GDP growth. Fama (1981), Chen et al. (1986), Dhungana (2013) and Giri and Joshi (2017) documented a positive role of GDP growth on common market returns. Therefore, based on the existing body of literature, the hypothesis is:

H1: *GDP growth has a significant positive impact on stock returns.*

Consumer Price Index (CPI)

CPI is an annual percentage change in consumer price measured in terms of the purchasing power of the currency. It is also considered as the proxy of the rate of inflation. Symbolically:

$CPIt = (CPIt – CPI(t-1) / CPI(t-1)$ . . . (5)

Where,

CPIt= Weighted national urban consumer price index of period t.

CPIt-1= Weighted national urban consumer price index of period t-1

Schwert (1981) examined the negative role of CPI to the market return. However, the magnitude of the impact was small. Likewise, Gertler and Grinols (1982) and Hsing (2013) empirically examined the negative role of inflation in predicting stock returns. Based on empirical support, the hypothesis is:

H2: *Rate of inflation has a negative role in predicting market returns.*

Money Supply (MS)

MS is the currency in circulation and total demand deposits in the economy (M1). Percentage change in the money supply for the period t over the period t-1 is considered as the growth in money supply. Ouma and Muriu (2014) examined the positive role of money supply in determining stock returns. Hence, the hypothesis is:

H3: *Money supply has a significant positive impact on common stock returns.*

Treasury Bill Rate (T-Bill)

Treasury bill rate is the risk-free rate of return. Treasury bill rate is calculated based on the weighted average of 364 days calculated and published by the NRB. Campbell (1987), Harvey (1989), and Mutoko (2006) confirmed that the increase in the T-Bill rate has a greater impact on the market than a decrease in the T-Bill rate. Thus, based on the theoretical backing of Campbell (1987), Harvey (1989), and Mutoko (2006), the research hypothesis for the study is as follows:

H4: *T-Bill has a significant negative impact on common stock returns.*

Lending Rate (LR)

LR is the lending interest rate used for the analysis. The weighted average lending interest rate as calculated and published by the NRB is used for the analysis as one of the macro-economic variables. Adaramola (2011) and Alam and Uddin (2009) reported that negative impact of long-term interest rate on stock return. Thus, the hypothesis is:

H5: Lending rate has a negative role in predicting stock returns.

Table 1 shows the expected impact of macro-economic variables and the common stock returns.

Table 1

Hypothesis and theoretical evidence

Variables	Expected Impact (Hypothesis)	Evidence
GDP Growth	+	Fama (1981), Chen et al. (1986), and Giri and Joshi (2017)
Consumer Price Index	-	Schwert (1981) and Gertler and Grinols (1982)
Money Supply	+	Ouma and Muriu (2014)
T-Bill	-	Campbell (1987), Harvey (1989), and Mutoko (2006)
Lending Rate	-	Adaramola (2011) and Alam and Uddin (2009)

Table 1 shows the hypothesis and theoretical evidence. The evidence shows that that GDP growth and money supply have a significant positive impact on common stock returns. in contrast, consumer price index, Government Treasury bills, and the lending rate have the significant negative effect on stock return in Nepali stock market.

Materials and Methods

To describe the different aspects of macro-economic variables and the common stock returns, descriptive research design was used. In addition, to describe the case and effect of macro-economic variables on stock returns, casual comparative research design has been used. The study is completely based on secondary data. All the data of macro-economic factors were extracted from the stock of Nepal Rastra Bank (NRB). Data set of stock prices were extracted from the database of NEPSE. A balance panel dataset has been used from 48 sample firms for 12 years from 2010/11 to 2021/22 with 576 observations. Table 2 shows the sampling details.

Table 2

Population and sample firms

SN	Industry/Sample Groups	Sample Firms
1	Banking and Financial Institutions (BFIs)	28
2	Insurance Companies Sample	14
3	Other Companies Sample	6
	Total Sample Firms	48

Firstly, descriptive analysis has been conducted to describe the different phenomenon of the macroeconomic variables and the common stock returns. Secondly, the relationship between the macro-economic variables and the stock returns have been examined by using the correlation analysis. And, finally, the case and effect of macro-economic variables on common stock returns have been examined by using the regression analysis. In addition. This process is further classified into four sub sections. Firstly, the impact of macro-economic variables on stock returns is examined from the data set of all samples. The robustness of the result is tested by using the subsample groups individually for BFIs, insurance companies, and other companies. The Ordinary Least Square (OLS) regression model employed for the study is given in equation 1.

$$CGYit = \beta1 + \beta2GDPGt + \beta3CPIt + \beta4MSt + \beta5T\text{-}Billt + \beta6LRt + \varepsilon t \quad \ldots (1.a)$$

$$DYit = \beta1 + \beta2GDPGt + \beta3CPIt + \beta4MSt + \beta5T\text{-}Billt + \beta6LRt + \varepsilon t \ldots (1.b)$$

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$TYit = \beta 1 + \beta 2GDPGt + \beta 3CPIt + \beta 4MSt + \beta 5T\text{-}Billt + \beta 6LRt + \varepsilon t$ . . . (1.c)

Where,

CGYit = Capital Gain Yield of sample i for period t.

DYit = Dividend Yield of sample i for period t.

TYit = Total Yield of sample i for period t.

GDPGt = GDP Growth Rate for period t.

CPIt = Annual growth rate of consumer price index for time 't'

MSt = Annual growth rate of money supply for time 't'

T-Billt = Weighted average rate of Treasury bills for time 't'

LRt = Rate of interest for time 't'

Dependent Variables

The study considers common stock returns as the dependent variable. Stock returns represent the overall rate of return from common stocks, comprising both market-driven gains and dividend income. Initially, the study examines the effect on returns from the market, which is then compared with return from dividend and total returns. Hence, return from the market, returns from the dividend, and the total returns combinedly from the market and dividend were considered as the dependent variables. Symbolically:

$CGYit = [Pit-Pi(t-1)] / Pi(t-1)$ . . . (2)

$DYit = Dit / Pi(t-1)$ . . . (3)

$TYit = [Dit + Pit - Pi(t-1)]/Pi(t-1)$ . . . (4)

Where,

CGYit = Annual capital gain of sample i for period t.

Pit = Market price per share of sample i for period t.

Pi(t-1) = Market price per share of sample i for period t.

DYit = Dividend yield of sample i for period t.

Dit = Dividend per share of sample i for period t.

TYit = Total yield of sample i for period t.

Results and Discussion

Descriptive Statistics

The descriptive analysis has been conducted to describe the characteristics of expected macro-economic variables during the study period of 2010/11 to 2021/22. It shows the data range of variables with mean and standard deviation.

Table 3 shows the descriptive statistics of the variables used. It includes minimum and maximum values with mean and standard deviations for all the variables used for the from 2010/ 2011 to 2021/2022. CGY is capital gain yield, DY is dividend yield, TY is total yield, GDPG is the GDP growth rate. CPI is inflation rate. MS is the annual growth rate in money supply. T-Bill is the 364 days weighted average government Treasury bills rate. LR is the weighted average lending rate. The values presented are in

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fraction of percentage.

Table 3

Descriptive analysis of the data used

Descriptive Statistics				
Variables	**Minimum**	**Maximum**	**Mean**	**SD**
CGY	-0.694	10.421	0.225	0.991
DY	0.000	0.432	0.043	0.049
TY	-0.689	10.421	0.268	1.003
GDPG	0.06	0.187	0.121	0.038
CPI	0.036	0.099	0.070	0.024
MS	-0.097	0.226	0.143	0.087
T-Bill	0.008	0.084	0.036	0.025
LA	0.080	0.125	0.106	0.016

The findings indicate that capital gain yield varies significantly ranging from a lowest -69.4% to a highest 1042.1%, with an average of 22.5% and a standard deviation 99.1%. Similarly, dividend yield spans from 0% to 43.2%, averaging 4.3% with a standard deviation of 4.9%. Similarly, total yield ranges from -68.9% to 1042.1%, with a mean value of 26.8% and a standard deviation of 100.3%. The substantial spread and high standard deviation in capital gain yield highlight the considerable volatility in investor returns within the Nepali capital market.

Among the macroeconomic variables, GDP growth rate lies in between 6% to 18.7% with mean 12.0% and standard deviation of 3.7%. Likewise, the consumer price index (CPI) growth rate lies between a minimum of 3.6% to maximum 9.9 % with mean 6.9% and standard deviation 2.3%.

Likewise, the minimum growth rate of money supply is -9.7% and maximum 22.6% having mean 14.2% and standard deviation 8.7%. Moreover, the rate of weighted average Treasury bills lies in between a minimum 0.7% and maximum 8.3% with a mean 3.5% and standard deviation 2.5%. Regarding the weighted average lending rate of financial institutions, it ranges from minimum 8% to maximum 12.4% with mean 10.6% and standard deviation 1.6%.

Correlation Analysis

The results from the correlation analysis between the macro-economic variables and the stock return have been presented and analyzed.

Table 4 shows the Pearson correlation coefficients between macro-economic variables and stock return for all the variables used for the from 2010/ 2011 to 2021/2022. CGY is capital gain yield, DY is dividend yield, TY is total yield, GDPG is the GDP growth rate. CPI is inflation rate. MS is the annual growth rate in money supply. T-Bill is the 364 days weighted average government Treasury bills rate. LR is the weighted average lending rate.

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Table 4

Correlation between macro-economic variables and stock returns

Pearson Correlation Coefficients								
Variables	CGY	DY	TY	GDPG	CPI	MS	T-Bill	LR
CGY	1							
DY	0.213**	1						
TY	0.999**	0.259**	1					
GDPG	0.108**	0.032	0.108**	1				
CPI	0.160**	0.227**	0.169**	-0.219**	1			
MS	0.286**	0.170**	0.291**	-0.364**	-0.105*	1		
T-Bill	-0.353**	-0.162**	-0.357**	0.321**	-0.117**	-0.793**	1	
LR	-0.249**	0.047	-0.244**	0.330**	-0.215**	-0.104*	-0.021	1

Table 4 shows that the correlation coefficients of GDP growth rate are positive with CGY (0.108**) & TY (0.108**) and significant at 1% significant level. The significant positive correlation coefficients suggest that GDP growth has a significant relationship with the stock return. More clearly, the higher the GDP growth rate, the higher the stock return would be. Similarly, the correlation coefficients of CPI are also positive and significant for all three measures of stock returns. The significant positive correlation coefficients further indicate that CPI has a significant positive relationship with the stock return. In the same way, the correlation coefficients of money supply on stock returns are also positive and significant at 1% level. Therefore, it is examined that the money supply has a significant positive relationship with stock returns.

In contrast, the correlation coefficients of Treasury bills rate are negative significant on all three measures of common stock returns. The significant negative correlation coefficients suggest that T-Bill has a significant negative relationship with stock returns. In the same way, the correlation coefficients of lending rate are also negative on two measures of common stock returns (CGY= -0.249** & TY = -0.244**) and statistically significant at 1% level of significance. Therefore, it is examined that lending rate has the significant negative relationship with stock returns in Nepali capital market.

Regression Analysis

In order to examine the magnitude of the impact of macro-economic variables on stock returns, the Ordinary Least Square (OLS) model has been used. The macro-economic variables include GDP growth, inflation rate, money supply, T-Bill, and lending rate. This section of data analysis is divided into four subsections. Firstly, the results from all sample firms have been presented and analyzed. The following subsection presents the results from the banking and financial institutions (BFIs) sample. The third subsection presents the results from the insurance companies' samples, and finally, results from the others sample companies' samples are presented and summarized. The results are shown in Table 5 to 8 respectively.

Table 5 reveals the regression result of macro-economic variables on stock returns from all 48 sample firms for 2010/2011 to 20212022. The explained variables are CGY, DY, and TY. CGY is Capital Gain Yield. DY is Dividend Yield, TY is Total Yield. GDPG is the growth rate. CPI is inflation rate. MS is the annual growth rate in money supply. T-Bill is the 364 days weighted average government Treasury bills. LR is the weighted average lending rate. The reported values are regression coefficients and standard errors in parentheses.

$$CGYit = \beta 1 + \beta 2GDPGt + \beta 3CPIt + \beta 4MSt + \beta 5T\text{-}Billt + \beta 6LRt + \varepsilon t$$

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$DYit = \beta1 + \beta2GDPGt + \beta3CPIt + \beta4MSt + \beta5T\text{-}Billt + \beta6LRt + \varepsilon t$

$TYit = \beta1 + \beta2GDPGt + \beta3CPIt + \beta4MSt + \beta5T\text{-}Billt + \beta6LRt + \varepsilon t$

Table 5

Regression results of macro-economic variables on common stock returns (all samples)

All Samples (n = 576)												
Variables	**Dividend Yield (DY)**				**Capital Gain Yield (CYG)**				**Total Yield (TY)**			
	Coefficients	t	P	VIF	Coefficients	t	P	VIF	Coefficients	t	P	VIF
Constant	2.000 (0.469)	4.264	0.000		-0.100 (0.024)	-4.099	0.000		1.901 (0.474)	4.010	0.000	
GDPG	3.536 (1.187)	2.980	0.003	1.349	0.112 (0.061)	1.820	0.069	1.349	3.648 (1.199)	3.042	0.002	1.349
CPI	3.662 (1.850)	1.979	0.048	1.302	0.693 (0.096)	7.228	0.000	1.302	4.355 (1.870)	2.329	0.020	1.302
MS	0.108 (0.817)	0.133	0.895	3.429	0.203 (0.042)	4.795	0.000	3.429	0.312 (0.826)	0.377	0.706	3.429
T-Bill	-15.676 (2.753)	-5.695	0.000	3.258	0.259 (0.143)	1.813	0.070	3.258	-15.417 (2.781)	-5.543	0.000	3.258
LR	-17.992 (2.664)	-6.753	0.000	1.238	-0.405 (0.138)	-2.935	0.003	1.238	-17.587 (2.692)	-6.532	0.000	1.238
Model Summary	F	29.818	P	0.000	F	14.898	P	0.000	F	30.151	P	0.000
	R2	0.207	SEE	0.887	R2	0.116	SEE	0.046	R2	0.209	SEE	0.896
	Adjusted R2	0.200	DW	2.218	Adjusted R2	0.108	DW	1.579	Adjusted R2	0.202	DW	2.211

Table 5 reveals that the regression results of GDP growth on stock return are positive with 1% significant level for (CGY = 0.003 & TY = 0.002). The significant positive coefficients of GDP growth indicate that stock return is positively affected by GDP growth. In simple terms, an increase in GDP growth leads to higher stock returns. Hence, the findings provide strong support for the research hypothesis that GDP growth positively and significantly influences common stock returns in the context of Nepal.

Similarly, the beta coefficients of CPI are also positive for stock returns (CGY = 3.662, DY = 0.693, & TY = 4.355) and significant at the 5% level. The regression results suggest that an increase in inflation leads to an increase in the investors' returns from the market. Simply speaking, as the inflation rate increases, stock returns also tend to rise. Therefore, the current findings do not provide any evidence to support the research hypothesis that inflation has a significant negative effect on investors' returns.

Likewise, the regression results show that the impact of money supply is positive and significant at the 1% level, but only for dividend yield (P = 0.000). This significant coefficient indicates that the money supply has a strong positive effect exclusively on dividend yield only.

On the other hand, the results of Treasury bills on stock return are negative for CGY (-15.676) and TY (-15.417) with significant P value at 1% level. The result indicates that T-Bill rates have a strong negative influence on stock returns. In other words, as T-Bill rates increase, stock returns tend to decrease. Thus, the evidence strongly supports the research hypothesis that T-Bill rates negatively and significantly affect stock returns.

Similarly, the regression results of lending rate are negative for CGY (-17.992), DY (-0.405), & TY (-17.587) and significant at 1% level. These negative results provide additional confirmation that lending interest rates adversely affect stock returns. In other words, an increase in lending rates is associated with a decrease in returns from stocks. These results offer ample evidence in support of the research hypothesis that lending interest rates have a significant negative influence on stock returns.

Table 6 reveals the regression result of macro-economic variables on stock returns from BFIs sample firms for 2010/2011 to 20212022. The explained variables are CGY, DY, and TY. CGY is Capital Gain

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Yield. DY is Dividend Yield, TY is Total Yield. GDPG is the growth rate. CPI is inflation rate. MS is the annual growth rate in money supply. T-Bill is the 364 days weighted average government Treasury bills. LR is the weighted average lending rate. The reported values are regression coefficients and standard errors in parentheses.

$CGYit = \beta1 + \beta2GDPGt + \beta3CPIt + \beta4MSt + \beta5T\text{-}Billt + \beta6LRt + \varepsilon t$

$DYit = \beta1 + \beta2GDPGt + \beta3CPIt + \beta4MSt + \beta5T\text{-}Billt + \beta6LRit + \varepsilon t$

$TYit = \beta1 + \beta2GDPGt + \beta3CPIt + \beta4MSt + \beta5T\text{-}Billt + \beta6LRt + \varepsilon t$

Table 6

Regression results of macro-economic variables on stock returns (BFIS samples)

BFIs Sample (n = 336)												
Variables	**Capital Gain Yield (CYG)**				**Dividend Yield (DY)**				**Total Yield (TY)**			
	Coefficients	t	P	VIF	Coefficients	t	P	VIF	Coefficients	t	P	VIF
Constant	1.516 (0.429)	3.534	0.000		-0.053 (0.030)	-1.782	0.076		1.463 (0.441)	3.316	0.001	
GDPG	4.012 (0.535)	7.498	0.000	1.349	0.213 (0.075)	2.833	0.005	1.349	3.661 (0.533)	6.870	0.000	1.349
CPI	4.197 (0.726)	5.780	0.000	1.302	0.575 (0.117)	4.909	0.000	1.302	3.374 (0.700)	4.820	0.000	1.302
MS	4.330 (0.958)	4.521	0.000	3.429	0.162 (0.052)	3.134	0.002	3.429	3.220 (0.984)	3.273	0.001	3.429
T-Bill	-9.116 (2.518)	-3.621	0.000	3.258	-0.018 (0.174)	-0.102	0.919	3.258	-9.134 (2.590)	-3.527	0.000	3.258
LR	-13.877 (2.437)	-5.695	0.000	1.238	0.131 (0.169)	0.777	0.438	1.238	-13.746 (2.507)	-5.483	0.000	1.238
Model	F	20.747	P	0.000	F	9.625	P	0.000	F	20.712	P	0.000
	R2	0.239	SEE	0.619	R2	0.127	SEE	0.043	R2	0.239	SEE	0.637
Summary	Adjusted R2	0.228	DW	1.941	Adjusted R2	0.114	DW	1.488	Adjusted R2	0.227	DW	1.924

Table 6 reveals that regression coefficients of GDP growth on CGY (4.012), DY (0.213), and TY (3.661) are positive and significant at 1% level. The significant positive regression results suggest that GDP growth has a significant positive impact on BFIs stock returns. Simply speaking, stock returns are positively affected by GDP growth for BFIs firms. Similarly, the results of CPI are also positive (CGY = 4.197, DY = 0.575, & TY = 3.374), and significant at 1% level. These results indicate that stock returns from BFIs are positively influenced by CPI. Which means an increase in the rate of CPI leads to an increase in investors' returns. Likewise, the regression results of money supply are also significantly positive (CGY = 4.330, DY = 0.162, & TY = 3.220). The significant regression results further validate that money supply has a strong positive influence on BFIs firm's stock returns.

Contrarily, the beta coefficients of Treasury bills are negative on CGY (-9.116), DY (-0.018), and TY (-9.138) and significant at 1% level (P = 0.000) for CGY and TY. The significant negative coefficients further confirm that the rate of T-Bills negatively affects stock returns from BFIs firms. Similarly, the regression coefficients of lending rate are also negative (CGY = -13.877 & TY = -13.746) with the significant P-values (0.000) in 1% level. The negative coefficients further confirm that lending interest rate has the significant negative impact on stock return in Nepali BFIs. It means that the higher lending rate tends to have lower market returns for BFIs. The results of T-Bill and LR are statistically insignificant to DY (T-Bill = 0.919 & LR = 0.438). The insignificant regression coefficients further confirm that T-Bill and LR both have an insignificant impact on dividend yield.

In contrast, Treasury bills and lending rate have significant negative impact on common stock returns in banking and financial institutions operated in Nepali stock market.

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Table 7 reveals the regression result of macro-economic variables on stock returns from insurance companies' sample for 2010/2011 to 20212022. The explained variables are CGY, DY, and TY. CGY is Capital Gain Yield. DY is Dividend Yield, TY is Total Yield. GDPG is the growth rate. CPI is inflation rate. MS is the annual growth rate in money supply. T-Bill is the 364 days weighted average government Treasury bills. LR is the weighted average lending rate. The reported values are regression coefficients and standard errors in parentheses.

$CGYit = \beta1 + \beta2GDPGt + \beta3CPIt + \beta4MSt + \beta5T\text{-}Billt + \beta6LRt + \varepsilon t$

$DYit = \beta1 + \beta2GDPGt + \beta3CPIt + \beta4MSt + \beta5T\text{-}Billt + \beta6LRt + \varepsilon t$

$TYit = \beta1 + \beta2GDPGt + \beta3CPIt + \beta4MSt + \beta5T\text{-}Billt + \beta6LRt + \varepsilon t$

Table 7

Regression results of macro-economic variables on stock returns (insurance companies' samples)

Insurance Companies Sample (n = 168)												
Variables	**Capital Gain Yield (CYG)**				**Dividend Yield (DY)**				**Total Yield (TY)**			
	Coefficients	t	P	VIF	Coefficients	t	P	VIF	Coefficients	t	P	VIF
Constant	3.210 (1.198)	2.680	0.008		-0.200 (0.047)	-4.234	0.000		3.010 (1.206)	2.495	0.014	
GDPG	8.303 (3.030)	2.740	0.007	1.349	-0.023 (0.120)	-0.191	0.849	1.349	8.281 (3.052)	2.713	0.007	1.349
CPI	11.002 (4.723)	2.329	0.021	1.302	0.990 (0.186)	5.310	0.000	1.302	11.992 (4.759)	2.520	0.013	1.302
MS	-2.209 (2.087)	-1.058	0.291	3.429	0.271 (0.082)	3.285	0.001	3.429	-1.938 (2.102)	-0.922	0.358	3.429
T-Bill	-33.470 (7.027)	-4.763	0.000	3.258	-0.553 (0.277)	-1.995	0.048	3.258	-32.916 (7.079)	-4.650	0.000	3.258
LR	-28.511 (6.802)	-4.192	0.000	1.238	-1.011 (0.269)	-3.765	0.000	1.238	-27.500 (6.852)	-4.013	0.000	1.238
Model Summary	F	14.345	P	0.000	F	8.054	P	0.000	F	14.315	P	0.000
	R2	0.307	SEE	2.555	R2	0.199	SEE	0.048	R2	0.306	SEE	1.231
	Adjusted R2	0.285	DW	2.500	Adjusted R2	0.174	DW	1.885	Adjusted R2	0.285	DW	2.500

Table 7 indicates that the beta coefficients of GDP growth on stock returns are positive for CGY (8.303) and TY (8.281) at 1% level. These significant positive values provide strong evidence that GDP growth has a positive effect on both CGY and TY within the Nepali insurance industry. In simpler terms, as GDP growth increases, common stock returns in this sector tend to rise accordingly.

Similarly, the regression results of CPI are also positive for stock returns (CGY = 11.002, DY = 0.990, & TY = 11.992) and significant (CGY = 0.021, DY = 0.000, & TY = 0.013) at 5% level. The significant coefficients of CPI further confirm that stock return from the insurance firms positively affected by CPI. Likewise, beta coefficient of money supply is also positive for dividend yield (0.271), and significant at 1% level (P = 0.001). This result indicates that returns from the insurance firms are positively affected by money supply.

Contrarily, the regression coefficients of Treasury bills on stock returns are negative and significant at the 5% level. These significant negative coefficients further indicate that T-Bill rates have a notable adverse effect on stock returns. In simple terms, as the T-Bill rate increases, stock returns in Nepali insurance companies tend to decline.

In the same way, the regression results of lending rate are also negative (CGY = -28.511, DY = -1.011,

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& TY = -27.5) with the significant P-value in 1% level. The result indicates that stock returns are negatively affected by lending rate in Nepali insurance industry.

Table 8 reveals the regression result of macro-economic variables on stock returns from other companies' sample for 2010/2011 to 20212022. The explained variables are CGY, DY, and TY. CGY is Capital Gain Yield. DY is Dividend Yield, TY is Total Yield. GDPG is the growth rate. CPI is inflation rate. MS is the annual growth rate in money supply. T-Bill is the 364 days weighted average government Treasury bills. LR is the weighted average lending rate. The reported values are regression coefficients and standard errors in parentheses.

$CGYit = \beta1 + \beta2GDPGt + \beta3CPIt + \beta4MSt + \beta5T\text{-}Billt + \beta6LRt + \varepsilon t$

$DYit = \beta1 + \beta2GDPGt + \beta3CPIt + \beta4MSt + \beta5T\text{-}Billt + \beta6LRt + \varepsilon t$

$TYit = \beta1 + \beta2GDPGt + \beta3CPIt + \beta4MSt + \beta5T\text{-}Billt + \beta6LRt + \varepsilon t$

Table 8

Regression results of macro-economic variables on common stock returns (other companies samples)

Other Companies Sample (n = 72)												
Variables	Capital Gain Yield (CYG)				Dividend Yield (DY)				Total Yield (TY)			
	Coefficients	t	P	VIF	Coefficients	t	P	VIF	Coefficients	t	P	VIF
Constant	3.906 (2.590)	1.508	0.137		0.323 (0.188)	1.722	0.090		4.229 (2.574)	1.643	0.106	
GDPG	1.475 (0.464)	3.181	0.002	3.570	0.008 (0.034)	0.240	0.811	3.570	1.483 (0.461)	3.218	0.002	3.570
CPI	1.171 (0.427)	2.740	0.008	3.636	0.052 (0.031)	1.694	0.095	3.636	1.223 (0.425)	2.880	0.006	3.636
MS	2.264 (0.577)	3.924	0.000	7.707	0.035 (0.042)	0.833	0.408	7.707	2.299 (0.573)	4.010	0.000	7.707
T-Bill	-0.443 (0.214)	-2.076	0.042	3.578	0.028 (0.015)	1.824	0.073	3.578	-0.472 (0.212)	-2.222	0.030	3.578
LR	-3.788 (0.861)	-4.400	0.000	2.614	-0.023 (0.062)	-0.364	0.717	2.614	-3.810 (0.856)	-4.454	0.000	2.614
Model Summary	F	4.873	P	0.001	F	1.270	P	0.289	F	4.927	P	0.001
	R2	0.289	SEE	0.669	R2	0.096	SEE	0.048	R2	0.291	SEE	0.665
	Adjusted R2	0.230	DW	2.165	Adjusted R2	0.020	DW	1.476	Adjusted R2	0.232	DW	2.097

Table 8 reveals that the beta coefficients of GDP growth rate are positive (CGY = 3.906 & TY = 4.229) and significant at 1% level. The significant positive coefficients indicate that GDP growth exerts a strong positive influence on stock returns in Nepali other companies' sample firms. In other words, as the GDP growth rate rises, stock returns are also likely to increase. Similarly, the regression coefficients of CPI are also positive (CGY = 1.171 & TY = 1.223) and significant at 1% level. The significant positive regression coefficients indicate that CPI has a significant positive effect on stock returns. In simpler terms, as CPI increases, stock returns for other companies' sample firms also tend to rise. Likewise, the beta coefficients of money supply are also positive (CGY = 2.264 & TY = 2.299) and significant at 1% level. The results examined that money supply has a significant positive effect on stock returns. In other words, an increase in money supply leads to higher stock returns for the other companies' sample firms in Nepal.

On the other hand, the regression results of the treasury bills rate and lending rate on stock returns are negative and significant at the 5% level. Therefore, the results suggest that Treasury bill rates and

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lending rate have a significant negative effect on stock returns. This implies that as both long-term as well as short-term interest rates rise, stock returns from the other companies' firms tend to decrease.

Table 9 presents a consolidated overview of the test results derived from the analysis of the impact of macroeconomic variables on stock returns across both the overall sample and the stratified sample groups. These results are displayed alongside the initial hypotheses (prior expectations) and are compared with findings from existing literature. The dependent variables are CGY, DY, and TY. CGY is Capital Gain Yield. DY is Dividend Yield, TY is Total Yield. GDPG is the growth rate. CPI is inflation rate. MS is the annual growth rate in money supply. T-Bill is the 364 days weighted average government Treasury bills. LR is the weighted average lending rate. The reported values are regression coefficients and standard errors in parentheses.

Table 9

Comparison of expected and observed relationship

Variables Expected													
Variables	Expected Sign	Capital Gain Yield (CGY)				Dividend Yield (DY)				Total Yield (TY)			
		All	BFIs	Insurance	Other	All	BFIs	Insurance	Other	All	BFIs	Insurance	Other
GDPG	+	+*	+*	+*	+*	+	+*	-	NA	+*	+*	+*	+*
CPI	-	+*	+*	+*	+*	+*	+*	+*	NA	+*	+*	+*	+*
MS	+	+	+*	-	+*	+*	+*	+*	NA	+	+*	-	+*
T-Bill	-	-*	-*	-*	-*	+	-	-*	NA	-*	-*	-*	-*
LR	-	-*	-*	-*	-*	-*	+	-*	NA	-*	-*	-*	-*

Where, '+' = Positive Impact, '-' = Negative Impact, '*' = Statistically Significant, and 'NA' = Model is Not Applicable

The explanatory power of GDP growth on stock returns is captured by regression coefficients are positive and statistically significant. The statistically significant positive coefficients of GDP growth provide strong evidence that GDP growth positively influences common stock returns in the Nepali capital market. In essence, when GDP grows at a higher rate, stock returns also tend to increase, indicating a direct and favorable relationship. This result aligns with the findings of numerous prior empirical studies, including those by Fama (1981), Chen et al. (1986), Dhungana (2023) and Giri and Joshi (2017), all of whom documented a significant positive association between GDP growth and stock returns. Therefore, the current analysis offers compelling support for the research hypothesis, affirming that GDP growth has a meaningful and positive impact on the performance of common stocks in Nepal's capital market.

The analysis reveals that the Consumer Price Index (CPI) exerts a statistically significant positive influence on stock returns, indicating that higher inflation rates are associated with increased stock returns. This outcome stands in contrast to several earlier studies such as those by Schwert (1981), Gertler and Grinols (1982), and Hsing (2013) which documented a significant negative relationship between inflation and common stock returns. On the other hand, the findings align with research conducted by Ibrahim and Aziz (2003) and Maysami et al. (2004), who also observed a positive effect of inflation on stock returns. Consequently, based on the present results, there is insufficient evidence to support the research hypothesis that the consumer price index has a significant negative impact on stock returns within the Nepali capital market.

The impact of money supply on dividend yield is found to be both positive and statistically significant for BFIs as well as for other companies' sample firms. This result confirms that an increase in money supply substantially enhances stock returns. This outcome aligns with prior research, including the study by Ouma and Muriu (2014), which also identified a significant positive relationship between money supply growth and common stock returns. Consequently, the evidence strongly supports the research

hypothesis that money supply plays a crucial and positive role in influencing common stock returns.

The findings clearly demonstrate that Treasury bill rates exert a statistically significant negative effect on stock returns in the Nepali stock market. In other words, as Treasury bill rates rise, stock returns tend to decline, indicating an inverse relationship between these variables. This outcome is consistent with previous studies conducted by Campbell (1987), Harvey (1989), and Mutoko (2006), all of which similarly identified a detrimental impact of Treasury bill rates on stock performance. Therefore, the current evidence provides robust support for the research hypothesis asserting that Treasury bills negatively and significantly influence stock returns in Nepal's stock market.

The statistically significant negative results related to the lending rate confirm that it adversely affects stock returns in the Nepali stock market. This implies that as lending interest rates increase, the returns on stocks in Nepal's capital market tend to decrease. Similar negative relationships have been documented in previous studies by Adaramola (2011) and Alam and Uddin (2009), who also found lending rates to have a significant detrimental effect on common stock returns. Consequently, there is ample evidence supporting the research hypothesis that higher lending rates significantly reduce stock returns in the Nepali market.

Conclusion and Suggestions

The study concludes that GDP growth, consumer price index (CPI), and money supply exert a statistically significant positive influence on common stock returns in the Nepali stock market. Conversely, Treasury bills and lending rates are found to have a significant negative impact on stock returns. This pattern holds consistently across different segments of the market: for banking and financial institutions (BFIs), insurance companies, and other sampled firms, GDP growth, CPI, and money supply positively affect stock returns, while Treasury bills and lending rates negatively influence them. These findings underscore the robust and differentiated effects of key macroeconomic variables on stock performance within Nepal's diverse market sectors. The findings of this study have important implications for future research, investment strategies, and economic policy in Nepal. The clear relationships identified between macroeconomic variables and stock returns open pathways for more advanced modeling, forecasting, and sector-specific analysis in emerging markets. Investors can use these insights to develop more informed and adaptive investment strategies by aligning their decisions with macroeconomic trends such as GDP growth, inflation, and monetary expansion. For policymakers, the results highlight the need for stable macroeconomic management, as shifts in interest rates and government securities directly affect market confidence and capital flow. In the context of Nepal's small and developing capital market, integrating macroeconomic indicators into regulatory, fiscal, and monetary decision-making could enhance market stability and foster long-term investment growth.

Author contribution statement

The author solely conducted conceptualization, data collection, analysis, writing tasks, addressing the comments of reviewers, and finalizing the manuscript.

Funding

There is no funding support for this study.

Declaration statement

The authors declare no conflict of interest.

ISSN 2350-8868
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JBM
The Journal of Business and Management
(B category academic journal as per UGC Nepal classification)

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The Impact of Digital Transformation on Organizational Resilience in Nepalese SMEs: The Mediating Role of Entrepreneurial Orientation

Siddha Raj Bhatt*

*School of Management, Kathmandu University, Lalitpur, Nepal

Received: 11 March 2025
Reviewed: 15 April 2025
Accepted: 7 May 2025
Published: 30 June 2025

Correspondence:
Siddha Raj Bhatt
siddhabhatt8984@gmail.com

Citation:
Bhatt, S. R. (2025). The impact of digital transformation on organizational resilience in Nepalese SMEs: The mediating role of entrepreneurial orientation. *The Journal of Business and Management, 9*(1), 88-104. https://doi.org/10.3126/jbm.v9iI.81191

Abstract

Background: Nepal's economy depends heavily on small and medium enterprises (SMEs), although they confront obstacles like scare resources and external disruptions. Digital Transformation (DT) has emerged as a key strategy to enhance organizational resilience (OR), enabling the enterprises to adapt and recover from such challenges. However, the adoption of digital technology in Nepalese SMEs remains low and the relationship between DT, OR and EO (Entrepreneurial orientation) is underexplored.

Objectives: This study investigates the impact of DT on OR in Nepalese SMEs, focusing on the mediating role of EO, to provide insights for building resilience and ensuring long-term sustainability in a dynamic business environment of Nepal.

Methods: This study employs a quantitative research approach using a cross-sectional survey design. A non-probability convenience sampling method was used. Data were collected from 303 SME owners, managers, and employees of Kathmandu Valley. The variable responses were analyzed using descriptive statistics, Partial Least Squares Structural Equation Modeling (PLS-SEM) including bootstrapping, reliability and validity tests. The data were analyzed using R 4.4.1 version.

Results: The study found that DT significantly improves OR in Nepalese SMEs by helping them adapt to challenges. While EO did not show a direct significant impact on OR, suggesting that proactiveness, innovativeness and risk-taking alone may not directly enhance OR, EO partially mediated the DT-OR relationship.

Conclusion: DT enhances OR among Nepalese SMEs, by helping them to adapt to disruptions for sustainable growth. SMEs using digital technologies better handle market uncertainties. Although, EO alone does not directly impact OR, it partially mediates the DT-OR relationship, meaning a strong entrepreneurial mindset helps SMEs fully leverage DT benefits. This highlights the importance of combining digital adoption with entrepreneurial culture to boost resilience and competitiveness.

Keywords: Business sustainability, digital transformation, entrepreneurial orientation, organizational resilience, SMEs

JEL Classification: L26, O33, M10

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Introduction

Small and Medium Enterprises (SMEs) play a pivotal role in economic growth and employment generation particularly in developing countries like Nepal. Despite their significance, SMEs remain under-researched, especially in the context of developing economies (Paudel, 2020). In Nepal, SMEs constitute approximately 90 percent of total enterprises, contributing significantly to national GDP and providing employment to nearly 2.6 million people (Sharma & Poudel, 2025). Further, SMEs account for around 95-98 percent of total enterprise establishments, contributing 83 percent to employment creation (Acharya & Pandey, 2018). However, despite their crucial role, Nepalese SMEs have struggled to achieve sustainable growth and expansion. Various institutional efforts to promote SME development have not yielded expected results, with stagnation in manufacturing and trading sectors and a high rate of SME failures (Ghimire, 2011; MoF, 2017). One of the primary reasons for this underperformance is the lack of strategic analysis and timely adaptation to changing market dynamics. In this evolving business landscape, digital transformation (DT) has emerged as a critical factor in ensuring organizational resilience (OR), enabling businesses to sustain operations and adapt to market disruptions effectively.

External disturbances such as natural disasters, technological disruption, political instability, economic changes and global crises including the recent COVID-19 pandemic pose significant threats to SME survival (Albaz et al., 2020). These disruptions are often unpredictable, making resilience a crucial determinant of business sustainability (Penadés et al., 2017). SMEs, due to their labor-intensive nature and high dependence on consumer perception, are particularly vulnerable to such crises. Organizational resilience is thus increasingly recognized as a strategic necessity for SMEs to survive and thrive in uncertain environments (Liu et al., 2021). While the COVID-19 pandemic highlighted the disruptive impact of external shocks, other factors such as rapid technological advancements, economic fluctuations, and political instability continue to challenge SME sustainability (Lopez-Torres et al., 2024).

Digital transformation has been identified as a fundamental enabler of organizational resilience in present context He et al. (2023). Businesses that effectively integrate digital technologies such as artificial intelligence, big data, cloud computing, digital payment system, social media reach, and IoT demonstrate higher adaptability to market shifts and crises (Nawaz & Koç, 2019). Organizations that successfully embrace digitalization can improve operational efficiency, enhance customer engagement and drive innovation, ultimately strengthening their resilience (Velu et al., 2019). The integration of digital technologies not only transforms traditional business models but also reshapes organizational strategies, structures, and cultures (Vial, 2021). However, the impact of digital transformation on organizational resilience is context-specific and requires a balanced approach to maximize benefits while mitigating associated risks (Wirtz et al., 2022).

In the Nepalese context, while SMEs are vital to economic growth, but they face challenges in adopting digital transformation due to limited resources, lack of technological expertise, and resistance to change. Consequently, the relationship between digital transformation and organizational resilience in Nepalese SMEs remains underexplored. Entrepreneurial orientation (EO), which encompasses proactiveness, innovativeness, and risk-taking, plays a crucial role in how firms respond to digitally driven changes. Rather than being a precursor to digital adoption, EO is seen as a behavioral outcome shaped by the digital transformation process, which creates a fertile ground for entrepreneurial trait to emerge and strengthen. Research suggests that EO fosters adaptability and resilience, helping firms leverage digital technologies for competitive advantage (Hughes et al., 2018; Wiklund & Shepherd, 2005). But in digitally transforming or transformed firms, entrepreneurial orientation proactively seeks innovations, adjusts to shifting market conditions, and enhances resilience in the face of uncertainty (Lumpkin & Dess, 1996; Lengnick-Hall et al., 2011). Despite these insights, the specific role of EO as a mediating factor in the relationship between digital transformation and organizational resilience remains unclear.

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This study aims to address this gap by examining the impact of digital transformation on organizational resilience among Nepalese SMEs and assessing the mediating role of entrepreneurial orientation in this relationship. By exploring these dynamics, this research seeks to provide valuable insights for SME owners, managers, and policymakers, aiding in the formulation of strategic frameworks for fostering resilience and competitiveness in a rapidly evolving digital landscape. The findings of this study will contribute to the theoretical understanding of digital transformation, organizational resilience, and entrepreneurial orientation while offering practical recommendations for enhancing SME sustainability in Nepal and other developing economies.

Review of Literature

Thematic Review

Digital transformation (DT) is the use of digital technologies to change how businesses operate and compete (Vial, 2021). By adopting tools like AI, computing, big Data, IoT, social media, digital payment system organizations can improve efficiency and customer experience (Resnick, 2002; Hanna, 2016). In Nepal, DT helps business stay resilient, but SMEs face challenges such as limited resources and infrastructure (Omrani et al., 2024; Adhikari & Molla, 2024). Still, DT is seen as a key for adapting to change and staying competitive (Zhang et al., 2021).

Organizational resilience (OR) is an organization's ability to adapt and recover from disruptions while continuing the operations (Lengnick-Hall et al., 2011). It involves turning challenges into opportunities for growth (Sutcliffe & Vogus, 2003), which is vital for SMEs facing frequent external disruptions (Liu et al., 2021).

Digital Transformation enhances organizational resilience by enabling SMEs to adapt to disruption through technological integration, as evidenced by the studies done by, (He et al. 2023) and (Zhang et al., 2021).

H1: *Digital transformation has a significant positive impact on organizational resilience in Nepalese SMEs.*

Entrepreneurial orientation (EO) involves innovativeness, proactiveness and risk-taking (Miller, 1983). It helps firms adapt to market changes and gain competitive advantages (Lumpkin & Dess, 1996). EO mindset is crucial for adopting to market changes and take necessary action for enhancing resilience during and after digital transformation (Covin & Miller, 2014) and firms with strong EO are better equipped to navigate uncertainties (Xia et al.,2024). However, its role in linking digital transformation to resilience in Nepalese SMEs needs more study.

H2: *Digital transformation has a significant positive impact on entrepreneurial orientation in Nepalese SMEs.*

Theoretical Review

The study is grounded in the Dynamic Capabilities Theory (DC), which emphasizes the ability of firms to integrate, build, and reconfigure internal and external resources to adapt to rapidly changing environments (Teece, 2016). DC theory posits that firms with strong dynamic capabilities can achieve sustainable competitive advantage by sensing opportunities, seizing them through resource mobilization, and transforming their operations to align with market demands (Teece, 2016). In the context of DT, dynamic capabilities enable firms to leverage digital technologies for innovation and resilience (Hernández-Linares et al., 2018). Similarly, DT helps in enhancing dynamic capabilities by fostering a culture of innovation, proactiveness, and risk-taking, which are critical for navigating changes and building resilience Abu-Rumman et al., (2021).

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Empirical Review

Empirical studies highlight the positive impact of DT on OR, particularly during crises such as the COVID-19 pandemic. For instance, He et al. (2023) found that DT enhances organizational resilience by improving digital intensity and transformation management intensity. Similarly, Kwiotkowska (2023) identified that a combination of digital capabilities and EO contributes to high organizational resilience, emphasizing the importance of fostering an entrepreneurial mindset in the digital era. In the Chinese context, Qinghua et al. (2024) demonstrated that EO positively influences digital business model innovation and resilience, further supporting the mediating role of EO in the DT-OR relationship. The research conducted by (Awad & Martin-Rojas, 2024) found that digital transformation improves the organizational resilience of SMEs and similarly the study conducted by Zhang et at., (2025) also shows that DT significantly enhances OR. These findings underscore the need for SMEs to integrate digital technologies with entrepreneurial strategies to enhance resilience and sustain competitive advantage.

EO (innovativeness, proactiveness, risk taking) is theorized to direct strengthen resilience, empirical evidence in Nepalese SMEs suggests its impacts may be indirect, Lumpkin & Dess (1996).

H3: *Entrepreneurial orientation has a significant positive impact on organizational resilience in Nepalese SMEs.*

According to Qinghua et al. (2024), SMEs with stronger entrepreneurial traits are better positioned to translate digital initiatives into resilient capabilities, a perspective supported by dynamic capability theory.

H4: *Entrepreneurial orientation mediates the positive relationship between digital transformation and organizational resilience in Nepalese SMEs.*

Policy Review

The Digital Nepal Framework (2019) and the Disaster Risk Reduction Management Act (2017) are key policy initiatives in Nepal aimed at promoting digital transformation and building organizational resilience. The Digital Nepal Framework emphasizes the adoption of digital technologies across various sectors, while the Disaster Risk Reduction Management Act focuses on risk assessment and capacity building to enhance resilience (Giri, 2020; Tuladhar, 2017). Additionally, the Nepal Startup Policy (2023) and the 15th Five-Year Plan prioritize entrepreneurship and digital innovation, providing financial and technical support to SMEs for adopting digital technologies and fostering entrepreneurial growth. These policies highlight the government's commitment to creating an enabling environment for digital transformation and resilience-building in SMEs.

Conceptual Framework

The conceptual framework of this study illustrates the interplay between digital transformation (DT), organizational resilience (OR), and entrepreneurial orientation (EO) in Nepalese SMEs. DT serves as the independent variable, enhancing OR by enabling firms to adapt to technological changes and market disruptions. EO acts as a mediating variable, amplifying the effects of DT on OR by fostering a culture of innovation, proactiveness, and risk-taking. The framework posits that digitally transforming SMEs created a fertile environment for entrepreneurial mindset for resilience-building, highlighting the importance of integrating digital initiatives with entrepreneurial strategies.

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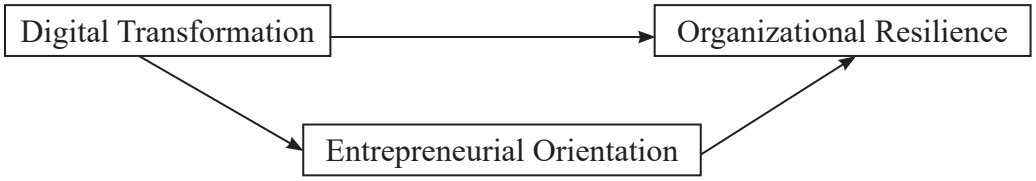
Figure 1

Conceptual Framework



Materials and Methods

Research Approach

The study employs a quantitative research approach using a cross-sectional survey design to examine the impact of digital transformation (DT) on organizational resilience (OR) among Nepalese SMEs, with entrepreneurial orientation (EO) as a mediating variable. The study follows a deductive approach, testing pre-established hypotheses through statistical analysis.

Research Design

A non-experimental, cross-sectional explanatory research design is used to investigate the relationships between DT, OR, and EO. Data were collected at a single point in time to analyze how these variables interact within Nepalese SMEs. The independent variable is digital transformation, the mediating variable is entrepreneurial orientation, and the dependent variable is organizational resilience.

Study Area and Population

The study focuses on SMEs operating within Kathmandu Valley, Nepal's largest business hub, where over 5,039 SMEs are registered (DOI, 2022/23). SMEs in Nepal are defined based on the size of investment in fixed assets or capital, with small enterprises having capital between NPR 2 million and 150 million, and medium enterprises having capital between NPR 150 million and 500 million (Industrial Policy, 2010). The selection of this region is based on its economic significance and the high concentration of SMEs, which serve as a representative sample of Nepalese SMEs.

Sampling and measurement

A non-probability convenience sampling technique was used to select SMEs. The sample size was determined using Daniel Soper's sample size calculation tool, based on an anticipated effect size of 0.20, a statistical power of 0.80, three latent variables, 32 observed variables, and a significance level of 0.05. The minimum required sample size was 296, but to enhance reliability, 400 questionnaires were distributed via email and printed form.

The measurement scale used for digital transformation is adopted and modified from (Nwankpa, 2016 & Chu, 2019) and the Cronbach's alpha reliability for the scale was 0.85, for Organizational Resilience the scale is adopted from (Kantur & Say, 2015), Cronbach's alpha reliability for the scale was 0.85 and for Entrepreneurial Orientation, scale is adopted from (Covin & Slevin, 1989). The EO contains three dimensions of EO (innovation, proactiveness, and risk taking) with three items on each dimension. The Cronbach's alpha coefficient for overall EO ranged from 0.72 (Arham, 2012) to 0.87 (Yang et al., 2008).

Research Instrument, Data collection and Analysis

Primary data were collected using a structured questionnaire administered via printed questionnaire and email surveys. It uses the 7 Likert scale from 1 to 7 for the DT construct, where (1= strongly disagree) and (7= strongly agree) and for the constructs OR and EO it uses 5 Likert scale from 1 to 5, where

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(1= strongly disagree) and (5= strongly agree). For studying this relationship researcher used three constructs i.e., digital transformation (5 items), organizational resilience (9 Items) and entrepreneurial orientation (18 items).

Google Forms were used for developing questionnaires and for online data collection and printed form were distributed for physical collection, where altogether questionnaire was sent to 400 respondents of SMEs (owners, employees, and managers) yielding 303 valid responses (response rate: 75.75 percent). Data were manually screened for missing values in Microsoft Excel before coding and statistical analysis. Hypothesis testing was carried out through the analysis of structural models and the analysis was conducted using R 4.4.1 software.

Results and Discussion

Descriptive statistics of demographic responses

The demographic variables of respondents include sex, age group, marital status, education level, position and business experience.

Table 1

Socio-demographic Characteristics

Demographic Variables	**Frequency**	**Percentage**
Sex		
Male	198	65.34
Female	105	34.65
Age (In years)		
Below 20	3	0.99
20-30	129	42.57
31-40	96	31.68
41-50	58	19.14
51-60	16	5.28
61 and above	1	0.33
Marital Status		
Single	125	41.25
Married	178	58.74
Educational Level		
Illiterate	1	0.33
Under SLC/SEE	1	0.33
Intermediate Degree	20	6.60
Bachelor's Degree	180	59.40
Master's Degree	89	29.37
Above Masters	12	3.96
Position		
Owner/Founder	46	15.18
Senior Management	62	20.46
Middle Management	149	49.17
Operational Staff	46	15.18

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Business Experience		
Less than 5 Years	81	26.73
5-15 Years	144	47.52
16-25 Years	59	19.47
26 Years and above	19	6.27

The socio-demographic characteristics of the respondents are summarized in Table 1. The majority of respondents were male (65.34 percent), reflecting a gender disparity in leadership and managerial roles within Nepalese SMEs. In terms of age, the largest group of respondents was between 20-30 years (42.57 percent), followed by those aged 31-40 years (31.68 percent), indicating a relatively young workforce. Most respondents were married (58.74 percent), which may suggest a higher level of personal responsibility and stability among participants.

Regarding educational attainment, the majority of respondents held a Bachelor's degree (59.40 percent), with a significant portion having a Master's degree (29.37 percent). This highlights the relatively high level of education among SME employees and owners in Kathmandu Valley, which may positively influence their ability to adopt digital technologies and foster entrepreneurial practices.

In terms of organizational roles, middle management (49.17 percent) constituted the largest group, followed by senior management (20.46 percent) and operational staff (15.18 percent). This distribution suggests that the respondents were well-positioned to provide insights into the operational and strategic aspects of their organizations.

Finally, nearly half of the respondents had 5-15 years of business experience (47.52 percent), while smaller proportions had less than 5 years (26.73 percent) or more than 16 years (25.74 percent) of experience. This indicates a mix of relatively experienced and newer entrants in the SME sector, providing a balanced perspective on the challenges and opportunities faced by these enterprises.

Table 2

Organizational Characteristics

Organization Type	**Frequency**	**Percentage**
Manufacturing	64	21.12
Service	90	29.70
Trading	78	25.74
IT/Tech	52	17.16
Others	19	6.27
Years of Operations		
Less than 5 Years	25	8.25
5-10 Years	75	24.75
11-20 Years	106	34.98
21 Years and Above	97	32.01
Organization Size (Capital)		
Up to 15 Crore	282	93.06
More than 15 crore-less than 50 crores	21	6.93

The organizational characteristics of the participating SMEs are presented in Table 2. The largest proportion of enterprises operated in the service sector (29.70 percent), followed by trading (25.74 percent) and manufacturing (21.12 percent). The IT/Tech sector (17.16 percent) and other industries (6.27 percent) represented smaller shares, reflecting the diverse nature of SMEs in Kathmandu Valley.

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In terms of years of operation, the majority of enterprises had been in business for 11-20 years (34.98 percent) or 21 years and above (32.01 percent), indicating a significant presence of well-established SMEs. A smaller proportion of enterprises had been operating for 5-10 years (24.75 percent) or less than 5 years (8.25 percent), suggesting that newer entrants face challenges in sustaining their operations.

Regarding organizational size, the vast majority of SMEs had a capital of up to NPR 15 crores (93.06 percent) regarded as small enterprises, with only a small fraction (6.93 percent) having capital between NPR 15 crores and 50 crores which are regarded as medium enterprises. This underscores the predominance of small-sized enterprises in the sample, which may face unique challenges in adopting digital technologies and building organizational resilience due to limited resources.

Inferential statistics of study variables

Common Method Bias using Harman's Single Factor Test

Harman's Single-Factor Test was conducted to check for common method bias since all variables were self-reported in the same measurement context. The test showed that a single factor accounted for 28.92 percent of the total variance, which is below the 50 percent threshold, indicating no significant common method bias and confirming that the relationships between variables are not heavily influenced by the measurement method (Podsakoff et al., 2003).

Collinearity Test

The VIFs obtained for all the variables values less than 3 indicates that there is no collinearity between the constructs DT, OR and EO.

Measurement model Assessment with reliability and validity

The first step in PLS-SEM is assessing the measurement (outer) model through reliability and validity tests. Reliability was evaluated using Cronbach's alpha (CA) and composite reliability (CR), with all constructs—Digital Transformation (0.807 CA, 0.882 CR), Organizational Resilience (0.869 CA, 0.916 CR), and Entrepreneurial Orientation (0.863 CA, 0.966 CR)—exceeding the 0.7 threshold, indicating strong internal consistency. Convergent validity was assessed using factor loadings, CA, and Average Variance Extracted (AVE), with all indicators showing loadings above 0.7 and AVE values of 0.861 (DT), 0.781 (OR), and 0.781 (EO), confirming strong construct representation. The results validate the robustness of the measurement model.

Discriminant Validity

Discriminant validity measures how well a construct and its indicators differ from other constructs (Bagozzi et al., 1991) and is tested using the Fornell-Larcker criterion and Heterotrait-Monotrait Ratio (HTMT). The Fornell-Larcker criterion requires that the square root of a construct's AVE be greater than its correlations with other constructs, while HTMT ensures inter-construct correlations remain below 0.85 (Henseler et al., 2015). As all criteria were met, the model confirms discriminant validity.

Table 3

Fornell-Larcker criterion test

Constructs	**DT**	**OR**	**EO**
DT	0.772	0.502	0.122
OR	0.502	0.839	0.275
EO	0.122	0.275	0.653

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The Fornell-Larcker criterion confirms discriminant validity by showing that the square root of the AVE (√AVE) for each construct—Digital Transformation (DT: 0.772), Organizational Resilience (OR: 0.839), and Entrepreneurial Orientation (EO: 0.653)—is greater than their correlations with other constructs. For example, DT's √AVE (0.772) is higher than its correlations with OR (0.502) and EO (0.122), and similar results are found for OR and EO. This ensures that each construct captures more variance within itself than it shares with others, confirming that DT, OR, and EO are distinct and measure unique dimensions.

Table 4

Heterotrait-Monotrait Ratio Result

Constructs	**DT**	**OR**	**EO**
DT	1.000		
OR	0.596	1.000	
EO	-0.250	-0.113	1.000

The Heterotrait-Monotrait (HTMT) ratio assesses discriminant validity in structural equation modeling to ensure constructs are distinct. With a threshold of 0.85, values below this indicate sufficient discriminant validity. In this analysis, the HTMT value between DT and OR is 0.596, confirming good discriminant validity. Additionally, the negative values for DT and EO (-0.250) and OR and EO (-0.113) indicate no significant overlap. Overall, all HTMT values are below the threshold, establishing that DT, OR, and EO are distinct and measure different theoretical constructs.

Goodness of fit

In PLS-SEM, the Model Fit Summary evaluates how well the model fits the data using measures like SRMR and NFI. A lower SRMR indicates a better fit, with a threshold of 0.08. In this analysis, the SRMR value of 0.0226 confirms an acceptable fit. Also, the NFI value of 0.466 falls below the recommended threshold of 0.90, suggesting goof fit.

Coefficient of Determination (R2)

R^2, or the coefficient of determination, measures the proportion of variance in the dependent variable explained by its predictors, indicating the model's predictive power. According to Chin (1998), R^2 values of 0.67, 0.33, and 0.19 represent substantial, moderate, and weak explanatory power, respectively. In this study, EO explains 21.10 percent of the variance (adjusted $R^2 = 0.2084$), indicating a moderate effect, while OR has a stronger relationship, with 42.96 percent of its variance explained (adjusted $R^2 = 0.4258$), confirming model robustness. These results highlight EO's critical mediating role in enhancing OR, supporting the hypothesis that EO strengthens the resilience of Nepalese SMEs undergoing digital transformation.

Table 5

Hypothesis testing and mediation analysis

Hypothesis	**Estimate**	**B**	**t-Stat**	**p-Value**	**95% CI Percentile**	**Decision**
H1 DT ~ OR	0.6010	0.0851	7.0629	0.0000	[0.4186; 0.7503]	Supported
H2 DT ~ EO	0.4593	0.2571	1.7869	0.0739	[-0.4538; 0.5975]	Not-supported
H3 EO ~ OR	0.2945	0.1563	1.8843	0.0595	[-0.2272; 0.4498]	Not-Supported
Indirect Effect	**Estimate**	**Std. Error**	**t-Stat**	**p-Value**	**95% CI Percentile**	
H4 DT ~ OR (via EO)	0.1353	0.0511	2.6489	0.0081	[0.0635; 0.2431]	Supported

The hypothesis test results showed that H1 and H4 are supported, while H2 and H3 are not. The bootstrapping technique with a 1,000-sample size was used to test four hypotheses. H1, which examines

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the impact of Digital Transformation (DT) on Organizational Resilience (OR), was supported (β = 0.0851, t = 7.0629, $p < 0.05$). H2, which tests the effect of DT on Entrepreneurial Orientation (EO), was not supported (β = 0.2571, t = 1.7869, p = 0.0739). H3, which investigates whether EO affects OR, was also not supported (β = 0.1565, t = 1.843, p = 0.0595). However, H4, which examines the mediating effect of EO in the relationship between DT and OR, was supported, showing a significant positive mediating effect.

The findings of this study contribute to the growing body of literature on the relationship between digital transformation (DT) and organizational resilience (OR), particularly in the context of Nepalese SMEs. The study confirms that DT has a significant positive impact on OR, aligning with prior research by Warner et al. (2019), Omoush et al. (2025), and Ivanov et al. (2019), which highlight the role of digitalization in enhancing business strategy, crisis preparedness, and innovation. In Nepal, SMEs leveraging digital tools demonstrate improved operational efficiency, customer engagement, and agility in navigating market disruptions. However, challenges such as high adoption costs, digital literacy gaps, and inadequate infrastructure remain barriers to maximizing these benefits. The study further underscores the need for government support in developing digital infrastructure, providing financial incentives, and promoting digital literacy to ensure a more resilient SME sector.

The study also investigated the relationship between DT and entrepreneurial orientation (EO), revealing an unexpected lack of significant impact in the Nepalese SME context. This contrasts with findings by Nambisan (2017) and Li et al. (2018), who established a positive link between DT and EO in other settings. This divergence may be attributed to contextual factors, including regulatory hurdles, slow technological adoption, and cultural resistance to risk-taking and innovation. Additionally, external constraints such as small market size, weak competition, and restrictive policies may dampen the need for entrepreneurial dynamism. Future research should adopt qualitative and longitudinal approaches to further explore these contextual limitations and identify potential moderating factors. Despite this, the study reaffirms the positive influence of EO on OR, consistent with the findings of Linnenluecke (2017), Duchek (2020), and Bullough & Renko (2013), emphasizing the role of proactive, innovative, and risk-taking behaviors in building resilient organizations. Moreover, the study highlights EO as a crucial mediating factor in the DT-OR relationship, suggesting that the full resilience benefits of digital transformation can only be realized when SMEs cultivate an entrepreneurial mindset. This supports the resource-based view (RBV) and dynamic capabilities theory, which stress the importance of internal competencies in leveraging external resources. From a managerial and policy perspective, fostering entrepreneurial skills, strategic risk-taking, and leadership in digital adoption is essential for enhancing SME resilience. Future research should explore additional mediators, such as organizational culture and leadership style, while longitudinal studies could assess how the DT-EO-OR relationship evolves as digital maturity increases.

Conclusion and Suggestions

This study provides insightful information about how digital transformation might strengthen SMEs resilience in the Kathmandu Valley. The findings show that organizational resilience is significantly influenced by digital transformation, that helps organizations whether shocks and adjust to shifting market conditions. The study also shows that this relationship is mediated by entrepreneurial orientation, which strengthens the effect of digital transformation on resilience. According to these results, SMEs can increase operational effectiveness, improve decision-making and maintain business continuity even in unpredictable situations by integrating digital technologies. Additionally, although entrepreneurial orientation was not found to have direct relationship with organizational resilience, the mediating function implies that the advantage of entrepreneurial mindset is reinforced by the DT environment. Combining digital adoption with entrepreneurial agility can give Nepalese SMEs a strategic advantage

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against economic uncertainties, competitive pressure and external shocks. Policies and support systems should prioritize both accelerating digital transformation and developing entrepreneurial capabilities in order to create a resilient SME sector, which will ultimately lead to long-term economic development, job creation and sustainable business growth.

Theoretically, future studies should expand beyond Dynamic Capabilities Theory by integrating frameworks like the Resource-Based View or Institutional Theory and explore additional mediating or moderating variables, such as organizational culture or leadership styles, while also conducting cross-cultural comparisons to understand contextual differences. Methodologically, adopting a mixed-methods approach, conducting longitudinal studies, and expanding sample size and diversity across regions and industries would enhance the robustness and generalizability of findings. Practically, promoting digital literacy, fostering an entrepreneurial mindset, and providing government support through incentives, infrastructure, and public-private partnerships are crucial for SMEs to effectively leverage DT for resilience.

For enhancing SMEs resilience and digital transformation in Nepal, policymakers should invest in affordable digital infrastructure, provide training program to improve digital literacy and offer financial incentives like tax breaks, subsidies or grants for technology adoption to SMEs. Strengthening entrepreneurial culture through innovation-focused initiatives and aligning policies like Digital Nepal Framework with resilience goals are crucial. Additionally, fostering collaborative eco-system among SMEs, tech firms and institutions along with monitoring progress through a national dashboard, will ensure sustainable growth and adaptability in a dynamic business environment of Nepal.

Author contribution statement

The author solely conceptualized and designed the study, conducted an extensive review of relevant literature, developed the research framework. Data collection, analysis, and interpretation were entirely carried out by the author. The author also wrote, edited, and finalized the manuscript for publication solely.

Funding

There is no funding support for this study.

Declaration statement

The authors declare no conflict of interest.

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Appendix: Survey instruments

Instrument 1: Digital Transformation (Nwankpa, 2016 & Chu, 2019)

- Our firm actively leverages digital technologies such as AI, big data, IoT, digital payment system, mobile technologies and social media to improve business processes.
- Our firm is integrating digital technologies such as AI, big data, IoT, digital payment system, mobile technologies and social media for operational change.
- Our day-to-day business operations increasingly rely on digital tools such as AI, big data, IoT, digital payment system, mobile technologies and social media.
- Our firm is designing and delivering products and services using innovative digital techniques and tools to meet customer needs.
- We actively promote digital knowledge and capabilities within the organization to strengthen our digital transformation efforts.
- Instrument 2: Entrepreneurial Orientation (Covin & Slevin, 1989)

Dimension (i) Innovativeness

- In general, top managers of my firm favor a strong emphasis on the marketing of tried-and-true products and services.
- In general, the top managers of my firm favor a strong emphasis on R&D, technological leadership, and innovations.
- How many new lines of products or services has your firm marketed in the past 5 years? No new lines of products or services.
- How many new lines of products or services has your firm marketed in the past 5 years? Very many new lines of products or services.
- Changes in product or service lines have been mostly of a minor nature.
- Changes in product or service lines have usually been quite dramatic.

Dimension (ii) Pro-activeness

- In dealing with its competitors, my firm typically responds to actions to which competitors initiate.
- In dealing with its competitors, my firm typically initiates actions which competitors then respond to.
- Is very seldom the first business to introduce new products/services, administrative techniques, operating technologies, etc.
- Is very often the first business to introduce new products/services, administrative techniques, operating technologies, etc.
- Typically seeks to avoid competitive clashes, preferring a 'live-and-let-live' posture.
- Typically adopts a very competitive, undo-the-competitors' posture.

Dimension (iii) Risk Taking

- In general, the top managers of my firm have strong proclivity for low-risk projects (with normal and certain rates of return).
- In general, the top managers of my firm have strong proclivity for high-risk projects (with chances of very high returns).
- In general, top managers of my firm believe that owing to the nature of the environment, it is best to explore it gradually via timid, incremental behavior.
- In general, top managers of my firm believe that owing to the nature of the environment, bold, wide-ranging acts are necessary to achieve the firm's objectives.
- When confronted with decision-making situations involving uncertainty, my firm typically adopts

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a cautious, 'wait-and-see' posture in order to minimize the probability of making costly decisions.
- When confronted with decision-making situations involving uncertainty, my firm typically adopts a bold, aggressive posture in order to maximize the probability of exploiting potential opportunities.

Instrument 3: Organizational Resilience (Kantur & Say, 2015)
- My organization is a place where all the employees are engaged to do what is required from them.
- My organization is successful in acting as a whole with all of its employees.
- My organization stands straight and preserves its position.
- My organization is successful in generating diverse solutions.
- My organization shows resistance to the end in order not to lose.
- My organization does not give up and continues its path.
- My organization rapidly takes action.
- My organization develops alternatives in order to benefit from negative circumstances.
- My organization is agile in taking required action when needed.

JBM
The Journal of Business and Management
(B category academic journal as per UGC Nepal classification)

ISSN 2350-8868
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The Math Mindset: How Master Business Students' Attitudes Impact Their Academic Success

Thakur Prasad Pokharel*

*School of Engineering of Pokhara University, Pokhara, Nepal

Received: 30 March 2025
Reviewed: 26 April 2025
Accepted: 19 May 2025
Published: 30 June 2025

Correspondence:
Thakur Prasad Pokharel
pokthakur287@gmail.com

Citation:
Pokharel, T. P. (2025). The math mindset: How master business students' attitudes impact their academic success. *The Journal of Business and Management, 9*(1), 105-119. https://doi.org/10.3126/jbm.v9iI.81192

Abstract

Background: Math mindset of business students seeks to understand how students perceive the role of mathematics in quantitative subjects such as accounting, finance, economics, auditing, and budgeting.

Objectives: The objective of this study is to examine the role of self-confidence, value, motivation, and enjoyment of mathematics in achieving success in business studies. This investigation aims to explore students' belief systems regarding the independent and dependents variables.

Methods: This study applied descriptive and analytical survey research design. A total of 265 respondents from MBA and MBS programs at various universities and colleges within the Pokhara Valley were purposively selected. Primary data was collected through field visits. The survey included nine demographic questions and 31 structured items. The reliability of the instrument was verified using Cronbach's alpha. Data analysis was made using descriptive and inferential statistics.

Results: This study has found a positive correlation between success in business studies and independents variables such as self-confidence, value, motivation, and enjoyment of mathematics. It has been revealed that the value of mathematics and motivations towards mathematics have a significant impact on success in business studies at the master's level. Mathematics is recognized as highly useful and relevant to their future academic and professional careers. Furthermore, more than 80% of students have expressed the need for additional mathematics classes during their study time.

Conclusion: The motivations towards mathematics and value of mathematics have significantly influenced outcomes in university-level management studies. The majority of learners have indicated a need for additional mathematics support during their studies. This suggests that admission criteria could be revised to make mathematics a compulsory subject at the school level. New learners can be guided and motivated to apply mathematical knowledge to real-life situations. Further research is needed to explore the cause-and-effect relationship between business students' attitudes toward mathematics and their success in business studies across different colleges, periods, and locations, to validate and generalize these findings.

Keywords: Enjoyment, mathematics, motivation, self–confidence, success

JEL Classification: C20, C40, C70

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Introduction

Mathematical knowledge, skills, and concepts are essential components of the numerical subjects in business studies, contributing significantly to academic success (Ely & Hittle, 1990; Ross, 2022). A substantial portion of the course content in quantitative subjects revolves around the application of mathematics. Academic performance in mathematics differs significantly between an ideal learning environment and a dull learning environment (Shamaki, 2015). Therefore, improving the learning environment can lead to enhanced academic achievement in mathematics. It can have a significant impact on the overall quality of education. Mathematics is highly relevant in various accounting courses, particularly in Auditing, Advanced Accounting, and Financial Accounting. A range of mathematical skills is essential for success in all accounting courses (Villamar et al., 2020). Knowledge of mathematics, calculation abilities, and proficiency in various mathematical operations are necessary for different types of accounting courses.

The four categories of mathematical culture in test items were historical topics, interdisciplinary connections, aesthetics and recreation, and social roles. The distribution of content categories was diverse but uneven. Questions related to the social role of mathematics and technology received more emphasis than those focused on historical topics. The study provided empirical evidence about the integration of question items within mathematical culture (Lei et al., 2022). It suggested that greater emphasis should be placed on questions related to interdisciplinary connections, social roles, and aesthetics and recreation, rather than solely focusing on historical content. The mathematics curriculum has incorporated more experience-based content than cognitive or empirical-based material. Classroom activities in China emphasize problem-solving, with approaches such as "one problem, multiple solutions," "multiple problems, one solution," and "one problem, multiple changes" (Cai & Nai, 2007). These problem-solving activities aim to strengthen the application of mathematical concepts in real life.

Under the previous ten plus two curriculum (classes 11 and 12), more than 60% of students in the management stream studied business mathematics in class 12, which was an optional subject alongside marketing. The evaluation process for business mathematics was comparable to other management stream subjects. A small number of students in the education and arts streams also studied basic mathematics in classes 11 and 12. Prior to 2010, in the Proficiency Certificate Level (PCL) at Tribhuvan University (TU), all second-year I. Com. students were required to study business mathematics, with a total of 50 marks for the subject. Science students, on the other hand, were required to study mathematics for 100 marks at the PCL level, while some students from education and arts also took mathematics at this level. However, in the updated curriculum of class 11 and 12, only a single digit percentage of students have studied business mathematics in class 11 and 12.

In Nepal, admission criteria of bachelor of business-related fields are only the minimum GPA requirement for admission. Accounting, Finance, Auditing, Budgeting, and Microeconomics need depth knowledge of mathematics. Business mathematics and statistics are compulsory subjects in bachelor's programs in business studies. Most of the students of bachelor level did not study business mathematics and basic mathematics in classes 11 and 12. Therefore, the study is conducted to explore the cause and effect of the attitudes towards mathematics of master-level students on their academic success. They studied the old curriculum of the management stream in classes 11 and 12. Most of them studied business mathematics in class 12.

Review of Literature

The mathematical background of students is closely linked to their attitude toward mathematics. These attitudes influence students' efforts and their choices concerning future career paths. While personal characteristics impact learners' attitudes toward mathematics, mathematical abilities are a significant

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factor in achieving success in business studies (Opstad, 2021). Basic mathematical concepts and principles are necessary across all disciplines, but applied and practical mathematics—excluding trigonometry—are particularly essential for business students to gain comprehensive knowledge. The relevance of mathematics to students' careers is emphasized in local textbooks. However, research found a lack of resources and support regarding the importance of mathematics for students' careers, based on interviews with secondary-level mathematics teachers. This led the researchers to address this gap by conducting a pilot study aimed at supporting secondary-level mathematics teachers (Fitzmaurice et al., 2021). Therefore, locally relevant aspects of mathematics should be incorporated into both textbooks and curriculum.

Mathematical concepts and knowledge are decisive for developing mathematical models and techniques used in data analysis, risk management, financial planning, and operational optimization (Saini, 2023). Business mathematics has direct applicability in the workplace, enhancing practical skills, problem-solving abilities, and decision-making capabilities. Whether it is an advanced mathematics course or business mathematics, it should be required starting from the school level. Students with a weak background in mathematics in business schools tend to obtain lower grades in many core business courses. In contrast, students with a strong mathematical background consistently achieve higher scores in these subjects. The application of mathematical knowledge is more critical in business courses like administration and accounting than in other areas (Opstad, 2018). Mathematics serves as the foundational base for both non-science and science education. The Attitude towards Mathematics Inventory (ATMI) shows a strong correlation with achievement in business education. Specifically, the self-confidence component of ATMI plays a significant role in success in business. For non-quantitative subjects, the impact of ATMI is minimal, and there is a negative correlation between educational achievement and the motivational dimension of learning mathematics (Opstad, 2023). In quantitative subjects, particularly in science, technology, and management, mathematical knowledge, skills, concepts, and ideas are in high demand in the global market.

The mathematical skills and personal traits of learners have a significant impact on their attitudes towards statistics (Opstad, 2020). Basic mathematical knowledge and rules are closely correlated with students' attitudes towards statistics. The relationship between mathematics and its application in economics is essential, as many economic problems can be effectively solved using appropriate mathematical models. The study and research of economic mathematical problems are intertwined (Sun, 2022). Advanced mathematics is central to achieving quality education in economics. Silva et al. (2016) found that students with strong mathematical and statistical backgrounds who entered British universities showed statistically significant differences in their chosen degree programs, and educational qualifications. Mathematical and statistical skills are in high demand in today's world, particularly in fields such as science, technology, data analysis, risk management, and financial analysis, all of which are based on the knowledge of mathematics and statistics.

Business and Management Administration degrees in social science tracks are highly required in today's job market (Shrestha et al., 2024). Mathematical skills are strongly correlated with academic achievement in business degrees. Students with an advanced mathematical background tend to perform better and achieve higher grades in business programs (Chaves et al., 2021). On the other hand, students with a poor mathematical background struggle to achieve good grades in business degrees, which hampers their ability to meet the demands of the modern job market. The mathematical skills developed during upper secondary school significantly impact university performance and retention, particularly in business and economics studies. Mathematics at the higher secondary level is vital for success in these degree programs. Business and marketing knowledge alone is less effective than mathematical skills for achieving success in economics and business degrees (Chaves et al., 2022). Therefore, mathematical knowledge and skills are essential for university education in business and economics.

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Motivational beliefs of learners towards mathematics are used to predict the success of students in exams in their mathematical courses (Saadati & Celis, 2023). Motivational belief towards mathematics should support achieving good grades in quantitative disciplines in university education. The values of mathematics became the greatest of the learners were preparation, family, respect, and determination (Hunter,2021). Practice, family, respect, and persistence of the students supported them to develop the value of mathematics. Motivation in mathematics played a greater role in students of the experimental group to obtain better results in achievement tests (Gholami et al., 2020). Students need regular motivation classes to develop a positive attitude towards mathematics. Students with a positive attitude towards mathematics make it easy to understand the quantitative subjects in business studies. Efforts of intrinsic motivation and hard work in learning styles of mathematics were positively correlated with each other (Sengodan & Iksan, 2012). Intrinsic motivation towards mathematics is a self–efficacy to study mathematics-related subjects. It encouraged the students to understand and interpret the numerical results.

Learners with high self-confidence in mathematics tend to have strong mathematical communication skills (Auli et al., 2021). These communication skills are essential for fields such as accounting, finance, and microeconomics. Therefore, self-confidence in mathematics helps students better understand these subjects. Çiftçi and Yıldız (2019) concluded that self-confidence in mathematics had a moderate impact on students' achievements in mathematics. Self-confidence plays a significant role in achieving notable outcomes in mathematical learning and subjects related to mathematics in higher education.

Numerous previous studies have explored attitudes toward mathematics using four key factors: self-confidence, value, motivation, and enjoyment (Guy et al., 2015; Huang & Lin, 2015). These factors:value, motivation, self-confidence, and enjoyment—play a decisive positive role in shaping attitudes toward mathematics. Students with a positive attitude toward mathematics are more likely to understand and perform well in numerically based quantitative subjects. Business mathematics combines mathematical concepts with business principles and practices, making it an interdisciplinary subject aimed at solving real-world business problems using mathematical techniques. Key topics in business mathematics include financial mathematics, linear programming, game theory, probability, and statistics. A concrete understanding of business mathematics helps students enhance their problem-solving abilities, develop strong analytical skills, and make informed decisions in addressing complex business challenges.

Based on the above literature reviews, a strong understanding of mathematics is essential for studying business-related subjects. Students with a solid foundation in mathematics at the school level are more likely to achieve good grades in subjects such as business mathematics, statistics, accounting, finance, microeconomics, auditing, and budgeting. Several research studies have examined the impact of learners' attitudes towards mathematics on their success in business studies, focusing on independent variables like self-confidence, value, motivation, and enjoyment of mathematics. This investigation aims to explore the cause-and-effect relationship between the attitudes of master's level business students toward mathematics and their academic success in Pokhara Valley. Such studies have not yet been conducted in Pokhara Valley or its surrounding areas. The goal of this study is to assess the mathematical foundation of students and examine the impact of their mathematical knowledge on their academic outcomes.

The conceptual framework for this research is structured around independent and dependent variables, as outlined below:

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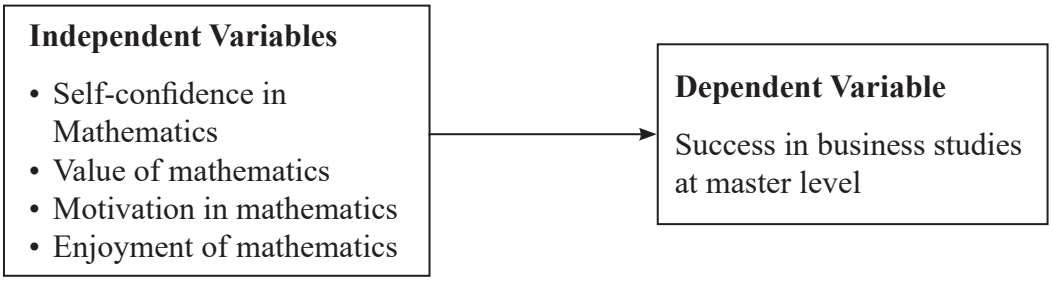
Figure 1

Conceptual Framework



Materials and Methods

This study applied descriptive and analytical survey research design to investigate attitudes toward mathematics and success in business studies at the master's level in Pokhara Valley. The descriptive research design was appropriate for identifying the status, patterns, and trends in the collected data regarding students' attitudes toward mathematics and their academic performance in business studies. The analytical component of the design was suitable for examining relationships, patterns, and potential influences between independent and dependent variables.

The target population of this study consisted of master's level students enrolled in MBS and MBA programs at various universities and their affiliated colleges in Pokhara Valley. Due to the limited study area and respondents, purposive sampling was employed. It followed a quantitative research approach and adopted primary data. A total of 280 questionnaires were distributed to the respondents with the support of faculty members and students. Of the 275 questionnaires returned, 8 were incomplete and 2 were excluded based on quality concerns of this study. 265 respondents were used for the final analysis.

The study designed a structured questionnaire that included 9 demographic questions and 31 standardized items. These 31 items were organized into five thematic segments: the first segment included 6 questions related to self-confidence, the second contained 6 questions measuring the perceived value of mathematics, the third addressed motivation toward mathematics with 6 items, the fourth focused on enjoyment of mathematics through 6 questions, and the final segment included 7 questions related to perceived success in business studies. The questionnaire was prepared in English, and each item was rated on a six-point Likert scale: strongly agree (6), agree (5), partially agree (4), partially disagree (3), disagree (2), and strongly disagree (1). The data was collected since June 2024 to October 2024 through field visits. The collected data were analyzed using the statistical software SPSS version 20. The researchers selected several colleges located in the Pokhara Valley that offer master's level business studies programs. These included the School of Business (SOB) at Pokhara University, Prithvi Narayan Campus (PNC), Janapriya Multiple Campus (JMC), and Gupteshwor Mahadev Multiple Campus (GMMC). Prior to data collection, the researchers contacted the administrative offices of the respective institutions and obtained formal permission to conduct the study. Primary data was then collected with the assistance of faculty members and students at each campus.

The mean was used to indicate the central tendency of each construct, helping to identify which items were rated higher on average compared to others. The standard deviation, a fundamental measure of dispersion, was used to assess the variability of responses within each item. Together, these descriptive statistics helped summarize the position of the constructs. To analyze relationships between variables, Karl Pearson's correlation coefficient was computed. This coefficient measures the strength and direction of the linear relationship between dependent and independent variables. Furthermore, regression analysis was calculated to examine the influence of independent variables on the dependent variable. This analysis

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provided information about the slope, indicating the degree to which changes in independent variables predict changes in dependent variable. Therefore, correlation and regression were used as part of the analytical approach in this study.

The internal consistency of selected constructs has been presented.

Table 1

Reliability analysis

Constructs	No. of items	α-value
Self – confidence in mathematics	6	0.893
Value of mathematics	6	0.869
Motivation towards mathematics	6	0.824
Enjoyment of mathematics	6	0.877
Success in business studies	7	0.856
Total items	31	

The results in Table 1 show that the reliability of the constructs ranges from the lowest value of 0.826 to a highest value of 0.893. Both values are above 0.800, indicating that each construct in this study is highly consistent. The overall reliability of the entire model is 0.941.

Results and Discussion

Table 2

Demographic variables

Demographic	Variables	Frequency	Percentage
Sex	Male	95	35.8
	Female	170	64.2
Residence	Village	27	10.2
	Municipality	80	30.2
	Sub-metropolitan	12	4.5
	Metropolitan	146	55.1
Associated University	Thribhuwan University	219	82.3
	Pokhara University	46	17.7
Programs	MBA	50	19.25
	MBS	215	80.75
Campus	SOB ,Pokhara -30	46	17.4
	PNC, POkhara -01	190	71.7
	JMC, POkhara -08	10	3.8
	GMMC , Pokhara -17	19	7.2
Semester/Trimester	First semester	110	41.5
	Third Semester	109	41.1
	Third Trimester	24	9.5

	Fifth Trimester	22	8.3
Occupation of Parents	Agriculture	100	37.7
	Business	57	21.5
	Teacher	19	7.2
	Job holder	35	13.2
	Aboard	17	6.4
	other	37	14.0
Studied math in class 11 and 12	Basic Mathematics	22	8.3
	Business Mathematics	191	72.1
	No Mathematics	52	19.6
Extra support for math	Yes	216	81.5
	No	49	18.5

Among the 265 master's level students in MBS and MBA programs, 35.8% were male and 64.2% were female, with nearly two-thirds of the learners being female. This suggests that a larger proportion of females had a background in business studies. According to Table 2, 10.2% of the learners lived in rural areas, 30.2% resided in municipalities, 4.5% lived in sub-metropolitan areas, and 55.1% lived in metropolitan areas. This indicates that 89.8% of the learners lived in municipal or metropolitan areas. Most of the learners, 82.3%, were enrolled at Tribhuvan University, while 17.7% attended Pokhara University. The majority of students were associated with constituent and affiliated colleges of Tribhuvan University. Additionally, 80.75% of the students followed the Master of Business Studies (MBS) curriculum, while 19.25% were enrolled in the Master of Business Administration (MBA) program.

The sample for this study included 46 students from the School of Business, Pokhara-30 Khudi, 190 students from Prithvi Narayan Campus, Pokhara-01 Bagar, 10 students from Janapriya Multiple Campus, Pokhara-08, and 19 students from Gupteshwor Mahadev Multiple Campus, Pokhara-17. The sample comprised 110 first-semester students, 109 third-semester students, 24 students in their third trimester, and 22 students in their fifth trimester. Additionally, 100 respondents had parents with an agricultural background, 57 had parents in business, 19 had teacher parents, 35 had parents employed in other jobs, 17 had parents abroad, and 37 had parents from other backgrounds, all of whom pursued higher education in business studies in Pokhara.

Among the 265 respondents, 8.3% had studied basic mathematics, 72.1% had studied business mathematics, and 19.6% had not taken any mathematics in classes 11 and 12. This indicates that 80.4% of master's level business students had a mathematical background at the secondary level. Additionally, 216 out of 265 students, or 81.5%, acknowledged the need for extra support in mathematics during their bachelor's and master's programs to achieve good grades. Most of the students had a mathematical background at school level, however they realized extra support in mathematics at university level.

Descriptive Analysis

Table 3

Self- confidence in mathematics

Particulars	Mean	S.D
I learn mathematics easily.	4.43	1.023
I believe I am good at solving mathematics problems.	4.43	0.927

I can solve mathematics problems without too much difficulty.	4.05	0.999
I expect to do fairly well in any mathematics class that I take.	4.32	0.996
Mathematics does not scare me at all.	4.30	1.026
I have a lot of self-confidence when it comes to math.	4.38	1.06

Note: Number of respondents are 265.

Table 3 shows that the highest average was 4.43, with a standard deviation of 0.927. This indicates that most respondents agreed with the second statement. The lowest average was 4.05, with a standard deviation of 0.999, suggesting that fewer respondents felt they could solve mathematics problems without much difficulty. Overall, most respondents were capable of mathematics and found it easy to perform mathematical computations.

Table 4

The value of mathematics

Particulars	Mean	S.D
I think studying mathematics is useful.	4.87	1.107
Mathematics is important in everyday life.	4.84	1.032
Mathematics is a very worthwhile and necessary subject.	4.74	1.006
A strong mathematics background could help me in professional life.	4.84	0.928
Mathematics is one of the most important subjects for students to study.	4.88	0.938
I can think of many ways in which I use mathematics outside the classroom.	4.57	0.90

Note: Number of respondents are 265.

The highest average in Table 4 was 4.88, with a standard deviation of 0.938, indicating that the majority of MBS and MBA students agreed that mathematics was one of the most important subjects to study. However, a smaller group of higher-level business students acknowledged using mathematics outside the classroom, with an average of 4.57 and a standard deviation of 0.90. The difference between the highest and lowest averages was minimal; suggesting that the responses for all the paradigms related to the value of mathematics had little variation. The averages for the first, second, fourth, and fifth statements were closely make straight, indicating that students consistently agreed that mathematics was both important and useful in their daily and professional lives.

Table 5

Motivation towards mathematics

Particulars	Mean	S.D
I can get good grades in mathematics	4.68	0.925
I know I can succeed with math.	4.58	0.887
I'm sure that I can learn math.	4.80	0.938
I think I could do better in math so far.	4.74	0.874
Learning math gives me knowledge and skills relevant to my future career.	4.78	0.937

Learning more mathematics opens up better paid job opportunities	4.61	0.959

Note: Number of respondents are 265.

The smallest and largest averages in Table 5 were 4.58 and 4.80, respectively, with standard deviations of 0.938 and 0.887. This suggests that most students were confident in their ability to learn mathematics, while fewer students felt certain that they could succeed in it. The difference between the highest and lowest averages was 0.22 which indicates that each construct was similarly influenced. Respondents generally agreed that they applied their mathematical knowledge to their future careers and believed they could learn, perform well, and achieve good grades in mathematics. They were motivated to study mathematics with a positive attitude.

Table 6

Enjoyment of mathematics

Particulars	Mean	S.D
Mathematics is a very interesting subject	4.69	1.009
I am happier in a mathematics class than in any other classes	4.48	1.000
I would prefer to do an assignment in mathematics than to write theory.	4.58	1.108
I like to solve new problems in mathematics.	4.57	1.032
I gain great satisfaction from solving a mathematics problem.	4.77	0.980
I am willing to take more than the required amount of mathematics	4.39	0.972

Note: Number of respondents are 265.

The means of the first, second, third, fourth, fifth, and sixth statements were 4.69, 4.48, 4.58, 4.57, 4.77, and 4.39, respectively. The highest mean, 4.77, was for the fifth statement, with a standard deviation of 0.980. This indicates that the majority of respondents agreed that they gained great satisfaction from solving mathematics problems. The lowest mean, 4.48, was for the second statement, with a standard deviation of 1.000, suggesting that a minority of respondents agreed that they were happier in a mathematics class than in any other class. The difference in the means of any two statements among the six was less than or equal to 0.29, which is a small number, indicating that the responses to these statements were consistent. On the base of the fifth and second statements pointed out that there were some problems in mathematics classes.

Table 7

Success in business studies

Particulars	Mean	S.D
I feel that math knowledge will help me to get a good grade in Business Math.	4.98	0.927
I realize that math's ideas support me to understand Statistics easily	4.89	0.887
I realize that math's knowledge supports the concept of financial analysis and investment.	4.75	0.946
I realize that mathematical concepts support achieving remarkable marks in financial accounting and budgeting.	4.66	0.949
I feel that mathematical concepts are used in Business Economics, Microeconomics, and Macroeconomics.	4.70	0.924

I realize that math is used in cost accounting.	4.65	0.935
I realize that math is not used in Organizational Management, Marketing, and Business Law.	4.15	1.064

Note: Number of respondents are 265.

The highest and second-highest means in Table 7 were 4.98 (with a standard deviation of 0.927) and 4.89 (with a standard deviation of 0.887), respectively. Most respondents believed that mathematical knowledge helped them achieve good grades in business math, and those mathematical concepts made it easier for them to understand statistics. The lowest mean was 4.15 (with a standard deviation of 1.064) for statement seven, indicating that fewer students agreed with this statement. Overall, most respondents moderately agreed that mathematics helped them understand and achieve good grades in subjects like finance, accounting, economics, and budgeting.

Table 8

Correlation matrix showing the relationship between the set of independent variables

	Self Confidence in Mathematics	The value of mathematics	Motivation towards mathematics	Enjoyment of Mathematics	Success in Business Studies
Self Confidence in Mathematics	1	0 .349**	0.535**	0.597**	0.321**
The value of mathematics		1	0 .656**	0.492**	0.609**
Motivation towards mathematics			1	0 .707**	0.535**
Enjoyment of mathematics				1	0 .457**
Success in Business Studies					1

The correlation coefficients between the various independent variables and the dependent variables were positive, suggesting that success in business studies is positively associated with self-confidence, value, motivation, and enjoyment of mathematics. The value placed in mathematics shows a strong correlation with success in business studies. Therefore, business students should develop a positive attitude towards mathematics to achieve excellent academic results. Motivation toward mathematics also strongly correlates with success in business studies, while self-confidence and enjoyment of mathematics show a moderate correlation with academic achievement. In conclusion, value, motivation, enjoyment, and self-confidence in mathematics are essential factors contributing to success in business studies.

Table 9

Regression Analysis showing Effect of Independent Variables on the Dependent Variable, Success in Business Studies in master level

Model	B	T	Sig	VIF
(Constant)	10.108	5.752	0.000	
Self –confidence in mathematics	0.004	0.059	0.953	1.619
Value of mathematics	0.451	6.805	0.000	1.763
Motivation of mathematics	0.235	2.473	0.014	2.760
Enjoyment of mathematics	0.109	1.497	0.136	2.316

The variance inflation factor (VIF) values in table 9 were all below 5, with the highest VIF being 2.760. This indicates that multi-collinearity was not an issue in the study. The p-values for the value

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of mathematics and motivation for mathematics were 0.000 and 0.014; respectively. This suggests that the value of mathematics and motivation for mathematics significantly impacted success in business studies at the master's level. The beta coefficient for the value of mathematics in relation to success in business studies was 0.451, meaning that for each unit increase in the value of mathematics; success in business studies is expected to increase by 0.451 units. Similarly, the beta value for motivation toward mathematics in relation to achievement in commercial studies was 0.235, indicating that a one-unit increase in motivation toward mathematics is expected to increase success in commercial studies by 23.5%.

The p-value for enjoyment of mathematics in relation to the output variables was 0.135, which is greater than 0.05. Therefore, enjoyment of mathematics did not significantly affect success in business studies, although it still showed a positive relationship with the dependent variables. The self-confidence in mathematics was insignificant with the success in business studies. This suggests that self-confidence in mathematics did not have a meaningful impact on the outcome of business studies. The R-squared value was 0.418, indicating that 41.8% of the variation in the output variables was explained by the input variables. The remaining part of success in business studies was influenced by other input variables expect above explained variables.

The major finding of this survey revealed that 216 out of 265 students (81.5%) required extra support classes for mathematics during their university studies. Interestingly, more than 80% of these students had previously studied mathematics in classes 11 and 12. This suggests that mathematics courses could be compulsory at the school level for students intending to pursue university-level business studies. Additionally, it highlights the need for an increase in the credit hours dedicated to mathematics in university programs, particularly in management streams. The study also demonstrated that mathematics is an interdisciplinary subject at the university level and is essential for students following higher education. It emphasized the importance of a compact mathematical foundation, which has been linked to success in core business subjects (Opstad, 2018). A strong understanding of mathematics allows students to perform well in quantitative business courses, thereby underlining the value of mathematics in the broader academic context. Overall, this study highlights the necessity of a rigorous mathematics education both at the school level and at university to ensure students are well-prepared for their academic and professional careers.

This fact-finding study revealed that self-confidence and enjoyment of mathematics did not significantly influence success in business studies. However, the value of mathematics and motivation to study the subject had a considerable impact on students' performance in business-related fields. Self-confidence and motivation in mathematics were found to influence achievement in business studies (Opstad, 2024). The study also noted that while motivation in mathematics produced similar results, the effect of self-confidence was contradictory. Specifically, self-confidence in mathematics had a moderate impact on success in commercial studies at the university level (Cifti & Yildiz, 2021). Furthermore, many of the respondents' friends had gone abroad to track better education and career opportunities. As they felt that political instability in their home country and insufficient job opportunities made it difficult to trust the government. As a result, self-confidence in mathematics did not significantly affect their success in business studies.

Most respondents agreed that mathematics is an important subject for higher education, essential in everyday life and professional settings. Mathematical skills are fundamental for success in all accounting courses (Villamar et al., 2020), and this study shows similar results. However, some respondents mentioned that mathematics is not always applicable outside of the classroom, mentioning issues with teaching methods, learning activities, and real-life applications. This study found that the value of mathematics significantly influenced success in business studies. Factors such as the learner's family background,

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study habits, respect for mathematics, and determination contributed to an increase appreciation of the subject (Hunter, 2021), which in turn played a significant role in achieving success in commercial studies. Mathematical well-being (MWB) and its value are closely connected in mathematical education (Hill et al., 2019), and this study presented similar findings. The beta coefficient for the value of mathematics was 0.451, meaning that the value of mathematics accounted for 45.1% of success in business studies. To enhance the value of mathematics, faculty members, campuses, and senior students should organize real-life-oriented mathematical activities both in the classroom and in social settings.

Motivation for mathematics has a significant influence on success in business studies and is strongly correlated with succession in business studies. Motivation toward mathematics positively impacts performance in business mathematics (Opstad, 2024). Motivational beliefs about mathematics help learners achieve better results in mathematics-related subjects (Saadati & Celis, 2023; Gholami et al., 2020). This study supports similar findings from previous research. Motivation promotes a positive attitude toward mathematics-related subjects, enabling learners to better understand quantitative topics and apply them in real-life business contexts. The majority of respondents believed that learning mathematics was important for their future careers. Some students, parents, and stakeholders argued that if students were motivated toward mathematics in earlier educational stages, they would find it easier to connect with and enjoy mathematics related subjects at the university level. The strength of intrinsic motivation for mathematics was clearly linked to diligent learning styles (Sengodan & Iksan, 2012). This study presents a similar argument to past research, highlighting that motivation toward mathematics is important at all educational levels and across all subjects. Mathematical knowledge and concepts encourage learners to develop problem-solving, analytical, and creative thinking skills across all disciplines. Mathematics forms the foundational basis for all quantitative subjects.

The enjoyment of mathematics was positively correlated with success in business studies at the higher level, although it did not significantly influence performance in those studies. Most participants in the study expressed the greatest satisfaction when solving familiar numerical problems, but they were less eager about mathematics classes compared to other subjects. Additionally, they showed little interest in tackling new math problems or completing mathematical assignments. This suggests there are issues within mathematics classes that need improvement. University-level mathematics courses should be made more student-friendly by incorporating various research activities related to the subject. The fundamental principles of mathematics are essential for understanding business mathematics, statistics, financial analysis, economics, and accounting. The study concluded that mathematics is an interdisciplinary subject that plays a decisive role in business studies.

Conclusion and Suggestions

This study explores how master's-level business students' attitudes toward mathematics affect their academic success, focusing on four key factors: self-confidence in mathematics, motivation toward mathematics, perceived value of mathematics, and enjoyment of mathematics. The findings reveal a positive correlation between academic success and all four attitudes. However, only the value of mathematics and motivation towards mathematics significantly influenced academic outcomes. Self-confidence and enjoyment, while positively correlated, did not show a direct impact on performance. Many students acknowledged the need for extra mathematics classes during their studies, despite having studied the subject of mathematics at the school level. The study also highlights that students recognize mathematics as highly applicable and valuable for both their personal and professional lives.

Most respondents emphasized that mathematics is essential for further studies and future careers. This suggests a potential revision of university admission criteria to include mathematics as a compulsory subject at the school level for business studies. Additionally, new business students can be better motivated and guided to apply mathematical knowledge in real-life situations. To address learners' needs

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and inquiries, the credit hours allocated to mathematics may be increased. While most students in the survey reported being good at mathematics during school and felt comfortable practicing it, they did not enjoy their mathematics classes. This highlights the need for faculty members to enhance the quality of mathematics education. Teaching and learning activities should be improved to create a more student-friendly and engaging learning environment.

This research study sheds light on the learning environment for mathematics-related subjects, the economic status of students, family influence, and job prospects. Some former students expressed that they struggled to apply mathematics effectively in their fields. The findings indicate that the values of mathematics and student motivation are essential aspects of business education, make parallel with views from educated individuals. The study predominantly involved respondents from specific classes, and further research in different locations and timeframes is needed to generalize and validate these results. Additional variables should be considered to better understand the causes and effects of students' attitudes toward mathematics and their success in business studies.

Author contribution statement

The author solely conducted conceptualization, data collection, analysis, writing tasks, addressing the comments of reviewers, and finalizing the manuscript.

Funding

There is no funding support for this study.

Declaration statement

The authors declare no conflict of interest.

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JBM
The Journal of Business and Management
(B category academic journal as per UGC Nepal classification)

ISSN 2350-8868
Volume IX | Issue 1 | June 2025

Intellectual Capital and Firm Performance of Banking Industry in Nepal

Udaya Kumar Shrestha*, Sudip Wagle*

*Birendra Multiple Campus, Tribhuvan University, Bharatpur, Nepal

Received: 25 March 2025
Reviewed: 23 April 2025
Accepted: 25 May 2025
Published: 30 June 2025

Correspondence:
Sudip Wagle
sudip.wagle@bimc.tu.edu.np

Citation:
Shrestha, U. K. & Wagle, S. (2025). Intellectual capital and firm performance of banking industry in Nepal. *The Journal of Business and Management, 9*(1), 120-134. https://doi.org/10.3126/jbm.v9iI.81193

Abstract

Background: Intellectual capital as the sum of knowledge, information, intellectual property and experience that can provide competitive advantages and high value. Intellectual capital is the most important factor to enhance firm performance.

Objectives: This study investigates the impact of intellectual capital on firm performance of banking industry in Nepal.

Methods: This study employed descriptive and casual research design. A google form survey was given to bank executives in order to achieve the objectives of the study. Out of 234 possible respondents 141 respondents completed the questionnaire as adequate form, which were taken as sample through convenience sampling method. The firm performance was the dependent variable, and intellectual capital (human, structural, social, and customer capital) were the independent variable. Both descriptive and inferential analysis were used to examine the data. Regression analysis was formulated in a linear model to analyze the relationship between the variables.

Results: The finding shows that the firm's performance explained by human capital ($\beta = 0.176$, $p = 0.090$), structural capital ($\beta = 0.003$, $p = 0.983$), social capital ($\beta = 0.307$, $p = 0.023$) and customer capital ($\beta = 0.270$, $p = 0.001$). The relationship between intellectual capital (human, structural, and customer capital) and firm performance were a statistically significant positive association. In regression coefficient, social capital and customer capital were found to be significant predictors of firm performance, but human and structural capital were not statistically significant predictors.

Conclusion: Social capital and customer capital were found to be significant predictors of firm performance, but human and structural capital were not statistically significant predictors. This study will appear as a successful piece of research work that explored both the intellectual capital conceptualization and orientation in the Nepalese banking industry. Furthermore, this study contributes to a better understanding of intellectual capital in Nepalese organization.

Keywords: Banking sectors, customer capital, firm performance, human capital, social capital

JEL Classification: L25, M12, O34

ISSN 2350-8868
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Introduction

Intangible assets, knowledge and skill, and enterprise value are the three ways that many academics describe intellectual capital. The knowledge, skills, business training, and any other personal information that might provide a company with a competitive edge are all considered forms of intellectual capital (Andriessen, 2001). It indicates that intellectual capital is a tactical asset which provides information for a competitive advantage.

Intellectual capital as the sum of knowledge, information, intellectual property and experience held by everybody in a company, put to use to create a competitive edge and, wealth (Stewart, 1997). Intellectual capital is the sum of a company's knowledge assets that can provide competitive advantages and high value. It is a term that refers to a strategic asset of firm that supports improving performance. Intellectual capital is the most important factor to enhance firm performance. Companies require skilled workers who have the know-how, skills, experience, as well as the ability to bring new ideas for the success of the business.

The majority of the literature focuses on three primary components: customer/relational capital, structural capital, and human capital (Ahmad et al., 2012; Akbari et al., 2013; Ramírez et al., 2011). Human capital, relational capital, structural capital, technological capital, spiritual capital, and social capital components of intellectual capital highlighted by Khalique et al. (2011). Thus, firm performance is influenced by human, organizational and environmental factors. The banking industry must invest in the development of its intellectual capabilities to maintain a competitive edge that is both sustainable and long-lasting. Four elements of intellectual capital have been included in this study to examine their effects on firm performance.

The present study seems to be a fruitful investigation into the concept and orientation of intellectual capital in the Nepalese banking industry. Very rare evidence has been established to disclose how much intellectual capital they have in order to explain the firm's performance and it may be a novel concept from a Nepalese perspective. The majority of the previous study has focused on financial performance (Akkas & Asutay, 2023; Smuda, 2022; Susanti et al., 2020). There is lower priority on non-financial i.e. intellectual capital, such as human, social, structural, and customer capital. So, this study is concerned with intellectual capital on firms' performance with perspective of banking industry in Nepal.

Review of Literature

Concept of Intellectual Capital

Several researchers have separated intellectual capital into various components to better understand it. Intellectual capital is categorized as encompassing: human capital, structural capital and relational capital (Bontis 1998; Curado & Bontis, 2007; Edvinsson & Malone, 1997; Sveiby, 1997; Roos & Roos 1997; Sallebrant et al., 2007). Three main elements combine intellectual capital: customer capital, structural capital, and human capital (Bontis et al., 1998). Furthermore, Hashim et al. (2018) expanded the research framework by adding three new factors, namely technological, social, and spiritual capital. Stewart (1997) suggested that intellectual capital is made up of three components: human capital, customer capital and structural capital. According to Bueno et.al. (2006), it includes human capital, organizational capital/structural capital, technology capital, social capital and business capital/customer capital. The role of intellectual capital in creating values has become crucial to achieve competitive advantage. Edvinsson and Malone (1997) examine intellectual capital as being comprised of two primary components: human capital (i.e. the knowledge skills and experience of employees) and structural capital (i.e. the embodiment, empowerment, and supportive infrastructure of human capital). Structural capital is divided into two smaller components: organizational capital (i.e. the systems, tools and operating philosophy that speed up the flow of knowledge through the organization) and customer capital (i.e.

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relationships a company has with its customers). Similarly, Steward (1997) conceives intellectual capital as composed of human capital and structural capital. He also subsumes organizational capital into structural capital. Bontis (1998) introduces the concept of relational capital as an expanded version of customer capital that includes the value of all relationships including host of customers. Relational capital is virtually identical to what sociologists and organization theorists (Nahapiet & Ghosal, 1988) refer to as social capital.

Ismail (2005) conducted a study in Malaysia that added the model of intellectual capital with the spiritual capital. Nevertheless, Bueno et al. (2006) proposed an intellectual model which comprised of five components: human capital, technological capital, business capital, social capital and organizational capital. Khalique et al. (2011) extended by developing the integrated intellectual capital model which includes six components as follows: human capital, customer capital, structural capital, social capital, technological capital and spiritual capital.

Intellectual Capital and Firm Performance

Intellectual capital impacts significantly on the performance of an organization. As it has been proved many in literature that intellectual capital has a strong impact on an organization performance (Khalique et al., 2013). Similarly, Mention and Bontis (2013) have concluded that among the components of intellectual capital, human capital has significant relationship with performance of banking sector whereas other two components although have positive related with performance but not statistically significant. Irsyahma and Nikmah (2017) found a positive relationship between intellectual capital and firm performance in Indonesian banking sector, and it was found that banks with greater levels of intellectual capital efficiency would perform better. According to Tiwari and Vidyarthi's (2018), there was a positive relationship between intellectual capital and firm performance in Indian public and private banks, implying that banks with higher intellectual capital efficiency perform better. Soewarno and Tjahjadi (2020) and Tran and Vo (2018) reported similar findings, indicating a strong and positive correlation between firm performance and intellectual capital.

Empirical Review

Clarke et al. (2011), conducted research to measure the impact of intellectual capital on performance of companies in Australia, listed from 2004-2008. This study uses the value-added coefficient of general intellectual capital and its components (human capital, structural capital, relative capital) as an independent variable and their relationship to performance (return on assets, profitability, input growth and employee productivity). It was found that a positive correlation between human and structural capital and their impact on performance, and that intellectual capital and performance particularly the efficiency of capital use were directly related. But a moderate relationship between intellectual capital and physical and financial capital, which affects the performance of companies.

Khalique et al. (2013) concluded that all three components of intellectual capital are significantly contributing to enhance the performance of Islamic Banks in Malaysia and concluded that intellectual capital stayed a substantial impact on Malaysia's Islamic banking sector's performance. Mention and Bontis (2013) showed that human capital contributes both directly and indirectly to firm performance in the banking sector. Structural and relational capital were positively related to firm performance, though results were not statistically significant. Unpredictably, relational capital was shown to negatively the effect of structural capital on performance.

Gautam (2015) has conducted a research paper on intellectual capital and organizational performance in Nepalese pharmaceutical industries. Human capital, structural capital and relational capital were found positively correlated with organizational performance. Similarly, Dhungana et al. (2017) have found that generally respondents stated that they have idea on the concepts of intellectual capital, gender does

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have much effect on learning and education and innovation and creation for improving organizational performance. This study examined that there was a positive relationship between all independent variables and organizational performance under human, relational and structural capital.

Tiwari and Vidyarthi (2018) have found that there was positive relation between IC and performance of banks, but only human capital and structural capital have shown instances of significant positive correlation with banks performance. Hasim et. al. (2018) investigated the relationship between six components of intellectual capital factors: human capital, structural capital, customer capital, social capital, technological capital and spiritual capital with organizational performance in Malaysia. The results found that intellectual capital was significantly influenced by organizational performance. Similarly, Hameed and Anwar (2018) found that the relationship between intellectual capital and organizational performances in selected private banks in Erbil. The relationship between organizational performance and structural capital as intellectual capital factors had highly correlated, Structural capital rational capital significantly predicted organizational performance, the lowest value was for human capital as intellectual capital dimension.

Abbas et al. (2018) have proposed to investigate the impact of six intellectual capital elements human capital, structural capital, customer capital, technology capital, social capital and spiritual capital on the overall performance of the firms. It was observed that customer capital, social capital, and spiritual capital are having a strong positive relationship. Whereas structural capital and technology capital have a strong positive relationship. Only human capital is having a significant positive relationship with organizational behavior.

Ibara et al. (2020) conducted study to ascertain human capital, structural capital and relational capital on the organizational performance of medium-sized firms in the Mexican manufacturing sector. Results showed that the three dimensions of intellectual capital have a positive and significant influence on organizational performance.

Al-assaf (2020) conducted that impact of intellectual capital in achieving competitive advantage in Jordanian telecommunications companies. Qurashi et al. (2020) conducted the impact of intellectual capital on innovation in pharmaceutical manufacturing SMEs operating in Karachi. The findings demonstrated that intellectual capital has a positive impact on the innovation of SMEs operating in the pharmaceutical industry.

Rawashdeh (2022) has examined the relationship between intellectual capital components (human capital, structural capital, and relational capital) and organizational performance. The results of the analysis showed that intellectual capital components (human capital, structural capital, and relational capital) had a positive effect on organizational performance.

Jayanti and Romli (2023) have presented a paper to examine the influence of intellectual capital on the performance of UMKM Tempe craftsmen in Sukabumi City with four sub-variables, namely social capital, customer capital, human capital, and technology capital. The findings of this study indicated that social capital and technological capital had an insignificant effect on the performance of SMEs. Customer capital and human capital have a significant positive effect on MSME performance. While social capital, customer capital, human capital, and technology capital all impact the performance of UMKM Tempe craftsmen in Sukabumi City.

There are many factors that influence firm performance; after reviewing existing literature, this study focuses on the new findings in the banking sector and examines fresh findings. The purpose of this study attempted to examine the impact of intellectual capital on firms' performance of managerial levels in commercial banks as a result of these variables and context-specific changes.

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Previous research in several kinds of industries, including manufacturing, banking, the pharmaceutical industry, services, and many more, has demonstrated. With a focus on Nepalese commercial banks, this study aims to investigate the effects of intellectual capital components on firms' performance. The following four components of intellectual capital are considered to analyze their impact on the firms' performance with perspective of Nepalese banking sectors.

Human capital

Human capital refers to forms associated with training, instruction, and other expert activities to increase a representative's knowledge, abilities, capacities, and social resources. According to Li-Chang and Chao-Wang (2012), human capital is the individual knowledge stock of an organization as represented by its employees; the availability of employees' skills, talents, and know-how needed to carry out the daily tasks required for the firm strategy (Rezaei & Mousavi, 2015); or the procedures related to education and training to raise the levels of knowledge, skills, abilities, values, and social assets (Radulovich et al., 2018; Kalkan et al., 2014; Marimuthu et al., 2009). Human capital affects firm performance both directly and indirectly (Hitt et al., 2001).

H1: *There is a significant impact of human capital on firm performance.*

Structural capital

Structural capital is also considered as the most important factor for development of organization. Structural capital was the knowledge embedded in an organization's processes, routines, and practices (Hejazi et al., 2016). Structural capital refers to a company's entire system and processes for overcoming obstacles and coming up with new ideas (Chu et al., 2006). According to Kamukama (2013) and Li-Chang & Chao-Wang (2012), it encompasses all non-human knowledge repositories in businesses, including databases, organizational charts, process manuals, strategies, processes, and much more.

H2: *There is a significant impact of structural capital on firm performance.*

Social capital

Social value also plays a vital role for development of organization. Social capital refers to the knowledge, capabilities of the employees or human resources to their subordinates, colleagues, customers, other organization's etc. Social capital is the ability of individuals to work together to accomplish shared objectives in different groups and organizations (Fukuyama, 2002). It is also referred to as corporate social responsibility, transparency, honesty, and ethics (Bueno et al., 2006; Khalique et al., 2011). Social capital is made up of relationships and norms that are the result of organizational behavior and that influence the quality of social interactions among stakeholders that contribute to the expansion of the economy (Hashim et al., 2018).

H3: *There is a significant impact of social capital on firm performance.*

Customer capital

A company's relationships with third parties, such as suppliers and customers, are referred to as customer capital (Clarke et al., 2011). According to Riahi-Belkaoui (2003), it considers a company's franchise value in addition to its ongoing relationships with the individuals or organizations it sells to. Siddiqui and Asadi (2014) state that it includes ties with stakeholders, industry allies, suppliers, customers, employees, and partners in strategic alliances, among other internal and external organizational relationships. Similarly, customer capital acted as a key factor in determining the market value of a business (Tabarsa et al., 2014).

H4: *There is a significant impact of customer capital on firm performance.*

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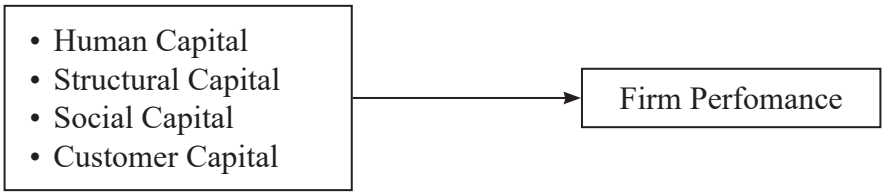
Conceptual framework

The goal of this study is to investigate how intellectual capital affects firm performance from the standpoint of Nepal's banking industry. Firm performance is employed as a dependent variable, while the four elements of intellectual capital (human, structural, social, and consumer capital) are regarded as independent variables. Based on actual data, the research framework and associated hypotheses are presented here. The study's conceptual framework is depicted in this graphic.

Figure 1

Conceptual framework



Note. Khalique et al. (2011), Shehzad et al. (2014)

Materials and Methods

The present study was aimed at investigating the impact of intellectual capital on firm performance in banking sectors. Descriptive and casual research design were used to reach the research objective. Descriptive research design was used to identify the status of intellectual capital position and find out the characteristics, frequency and behaviour of the respondents. Causal research design was used to investigate the relationship between different factors of intellectual capital and firm performance. The study focuses on the twenty commercial banks categorized as Class 'A' by the Nepal Rastra Bank (NRB) until November 2024. The overall population comprises 1694 individuals holding managerial positions (branch managers and above) within eight selected commercial banks based on their year of establishment. Older banks may have more extensive historical data, which can be beneficial for researchers seeking comprehensive information for their analysis.

Table 1

Sample banks

Banks	CEO	DGM	D. Head	BM	Total
NBL	1	5	15	226	254
RBBL	1	7	23	270	308
ADBL	1	6	25	279	321
NABIL	1	8	29	266	311
NIMB	1	16	34	296	354
SCB				14	14
HBL				71	71
EBL				61	61
Total					**1694**

A two-stage sample selection technique was employed. Initially, a purposive sample technique was used to select banks. Managerial officers, department heads, and branch managers were selected as sources of information for the study by convenience sampling to participate in the study. Sample size was determined 234 using Cochran's (1977) formula at 90% Confidence level. Google forms were used

for conducting surveys with representatives from managers level or above. The forms were completed by accessing the bank's website, confirming mail address and contact numbers of respondents and recalled for follow-up where needed. Ultimately, one Deputy Chief Executive Officer (DCEO), one department head, and 139 branch managers responded. The final sample size was 141 responders, reflecting those who provided usable responses. Although it was the initial target, the usable response rate was 60.25%. The data and information were collected from a structured questionnaire survey which contains respondents' demographic information, multiple-choice questions, and 5-point Likert scale questionnaires ranging from '1′ strongly disagree to '5′ strongly agree. The pre-tested questionnaire were used based on previous studies from (Amrizah & Rashidah, 2013; Khalique, Bontis & Shaari, 2018; ; Ngah & Ibrahim, 2009). This study was conducted in conjunction with a previously administered questionnaire, that undertook testing for validation.

To ensure the instrument's reliability, Cronbach's Alpha was employed, and the analysis proceeded only when the obtained value surpassed 0.7. Items with loadings of 0.6 or higher were considered reliable and acceptable, as per the criteria proposed by Sekaran and Bougie (2016).

Descriptive analysis was used to describe and summarize the data in meaningful way making them more useful. The data was analyzed using percentage calculations, mean determination, and standard deviation computation. Additionally, analysis of frequency was employed. The dependent variable in this study was measured the performance using a Likert scale encompassing various constructs. Correlation and regression analysis was conducted to examine the relationship between the dependent variable and the independent variables. ANOVA was used to ascertain the significance of the regression model. Regression analysis was formulated in a linear model to examine the relationship between the dependent and independent variable with equation as below.

$FP = \beta 0 + \beta 1HumC + \beta 2StruC + \beta 3SocC + \beta 3CusC + \varepsilon$

Where;

FP = Firm Performance $\beta 0$ = Regression constant HumC = Human Capital

StruC = Structural Capital SocC= Social Capital CusC = Customer Capital

Results and Discussion

Descriptive statistics of demographic responses

Table 2

Demographic Profile of Respondents

Variables / Categories	Frequency	Percentage
Gender		
Male	125	88.7
Female	16	11.3
Marital Status		
Married	140	99.3
Unmarried	1	0.7
Age		
25 - 40 Years	79	56
Above 40 Years	62	44
Education		
Bachelor's degree	23	16.3

Master's degree	117	83.0
MPhil	1	00.7
Position / Responsibility		
Branch Manager	139	98.6
Head of department	1	0.7
Deputy CEO	1	0.7

Note: Questionnaire survey, 2024.

Table 2 depicts the demographic profile of respondents based on gender, marital, age, education and responsibility. The majority of the sample identifies as male, constituting 88.7% of the total and female group represents only 11.3% of the total respondents. Similarly, the majority of the respondents, 140 (99.3%) were married, while the remaining 1 respondent was single, representing 0.7% of the sample. The majority of the samples fall within the 25 - 40 years age group, constituting 56% and above 40 years age group represents 44% of the total respondents. The total respondents, 83.0% have a master's degree as majority. The proportion of respondents with a bachelor's degree is lower at 16.3%, and there is a single respondent with MPhil degree, for 0.7% of the total respondents respectively. Finally, the respondents representing position or responsibility. The branch manager's level was found the highest, which comes from 98.6%. The head of department level was found 0.7 %. and deputy CEO which covers 0.7% only.

Table 3

Reliability of the Instrument

Variables	N	Cronbach's Alpha
Human Capital	10	.701
Structural Capital	10	.910
Social Capital	7	.874
Customer or Relational Capital	8	.705
Firm Performance (Perceived perception)	10	.805

Note. Output of Statistical Package of Social Science (SPSS-22).

Table 3 depicts the questionnaire's dependability in terms of respondents' perceptions of intellectual capital. Better internal consistency reliability is usually indicated by higher Cronbach's Alpha values. All of the variables have a Cronbach's Alpha of more than 0.7. It can be concluded that each variable's item is reliable due to the greater than threshold value.

Table 4

Overall Descriptive Statistics

Variables	N	Min	Max	Mean	Std. Deviation
Human Capital	141	3.0	4.5	3.756	0.366
Structural Capital	141	2.3	4.9	3.517	0.580
Social Capital	141	2.6	4.8	3.697	0.566
Customer Capital	141	3.2	5.0	4.112	0.308
Firm Performance	141	3.3	5.0	3.976	0.372

Note. Output of Statistical Package of Social Science (SPSS-22).

Table 4 demonstrates that firm performance is measured by four independent variables (human capital,

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structural capital, social capital and customer capital). The mean ± SD of human capital was 3.756 ± 0.3659, structural capital was 3.517 ± 0.580, social capital was 3.697 ± 0.566 and customer capital was 4.112 ± 0.308. The finding revealed that there was a positive attitude (>3) of firm performance through human, structural, social and customer capital.

Correlation Analysis

Bivariate Pearson Correlation tests were used to acquire a statistical evaluation of the strength of each linear relationship between dependent (firm performance) and independent variable (human, structural, social and customer capital).

Table 5

Association between Intellectual Capital and Firm Performance

	Firm Performance	Human Capital	Structural Capital	Social Capital	Customer Capital
Firm Performance	1				
Human Capital	.465**	1			
Structural Capital	.519**	.718**	1		
Social Capital	.573**	.704**	.838**	1	
Customer Capital	.481**	.300**	.500**	.518**	1

*Note. ** Correlation is significant at the 0.01 level (2-tailed).*

Table 5 represents the relationship between human capital and firm performance has positive correlation (r =0.465, p=0.000) which is statistically significant. The relationship between structural capital and firm performance has a positive correlation (r =0.519, p=0.000) which is statistically significant. The relationship between social capital and firm performance has a positive correlation (r =0.573, p=0.000) which is statistically significant. Furthermore, the relationship between customer capital and firm performance has a positive correlation (r =0.481, p=0.000) which is statistically significant.

Regression Analysis

Table 6

Coefficient of Regression Result of IC on Firm Performance

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Tol.	VIF
	B	Std. Error	Beta				
(Constant)	1.186	0.431		2.748	0.007		
Human Capital	0.183	0.107	0.176	1.710	0.090	0.436	2.294
Structural Capital	0.002	0.087	0.003	0.021	0.983	0.257	3.891
Social Capital	0.204	0.089	0.307	2.295	0.023	0.259	3.865
Customer Capital	0.327	0.099	0.270	3.315	0.001	0.697	1.436
R = 0.625 R2 = 0.390 F= 21.129 Sig.= 0.000							

Note. Output of Statistical Package of Social Science (SPSS-22).

Table 6 indicates that the coefficient of determination (R2) was 0.390 which indicates 39.0% of the firm's performance is explained by independent variable remaining 61.0% explained by other variables. Furthermore, there is a positive correlation (r=0.625) between dependent and independent variable.

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Moreover, the significant test for the overall model by goodness of fit. Findings show that the firm's performance was statistically significant for four independent variables (F = 21.129; p-value = 0.000).

Regression-coefficient shows that firm performance explained by human capital (β = 0.176, p = 0.090), structural capital (β = 0.003, p = 0.983), social capital (β = 0.307, p = 0.023) and customer capital (β = 0.270, p = 0.001). The social capital and customer capital variables appear to be statistically significant predictors of the dependent variable, while human capital and structural capital are not statistically significant in this model. Furthermore, there was no possibility of multi-collinearity (VIF <10) among the independent variable in the study. Likewise, the values of Tol ≥ 0.1 indicate that there was an absence of multicollinearity.

Table 7

Hypothesis Testing

S. N.	Statement	B	p-value	Remarks
1	There is a significant effect of human capital on the performance of the firms.	0.183	0.090	Not supported
2	There is a significant effect of structural capital on the performance of the firms.	0.002	0.983	Not supported
3	There is a significant effect of a social capital on the performance of the firms	0.204	0.023	Supported
4	There is a significant effect of customer capital on the performance of the firms.	0.327	0.001	Supported

Table 7 reveals that social capital and customer capital as a major predictor of firm performance whereas human capital and structural capital are not statistically significant predictors at 5% level of the significant. Hence, it seems that social and customer capital has a positive impact on firm performance.

Intellectual capital, as an intangible asset, comprises human, structural, and relational (or customer) capital, with some studies also including social capital as a distinct component (Clarke et al., 2011; Gautam, 2015; Hameed & Anwar, 2018; Rawashdeh, 2022; Riahi-Belkaoui, 2003). This study examined the effects of these four elements human, structural, customer, and social capital on firm performance within the Nepalese banking sector. The findings indicate a positive relationship between intellectual capital components and firm performance, particularly emphasizing the significant role of customer capital. These results align with prior research by Subramaniam and Youndt (2005) and Abbas et al. (2018), which similarly found that intellectual capital positively influences organizational outcomes. Furthermore, this study is supported by research (Khalique et al., 2013). This study has reached the same conclusion: customer capital is a substantial predictor of company performance, but neither human nor structural capital are significant predictors.

In this study, the hypothesis H1 and H2 were rejected. Hence, human and structural capital have not impact on firm performance in banking sectors in Nepal and this finding was supported with the finding of Sarwenda (2020). Human capital and structural capital by individually do not significantly impact the firm performance, according to Muhammad and Ismail (2009). However, the results of this study supported the banking sectors in Nepal. The performance of the firms is found to be insignificantly impacted by both structural and human capital. The lack of significant impact may be attributed to contextual factors specific to the Nepalese banking sector, such as limited investment in human resource development or underdeveloped structural frameworks.

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Conclusion and Suggestions

There is a positive and statistically significant correlation between intellectual capital (specifically human, structural, social, and customer capital) and firm performance. This suggests that as the levels of intellectual capital increase within the organization, the overall performance of the firm also tends to improve. The hypothesis regarding the impact of human capital on firms' performance was rejected. This suggests that, based on the analysis, there is no statistically significant evidence to support the notion that human capital has a direct impact on the performance of commercial banks in Nepal. Similarly, the hypothesis related to the impact of structural capital on firms' performance was rejected. The statistical analysis did not provide significant evidence to conclude that structural capital plays a direct role in influencing the performance of commercial banks in the context of Nepal. In contrast, the hypothesis regarding the impact of social capital on firms' performance was accepted. The statistical analysis suggests a positive and statistically significant relationship between social capital and the performance of commercial banks in Nepal. The hypothesis related to the impact of customer capital on firms' performance was also accepted. The analysis indicates a positive and statistically significant impact of customer capital on the performance of commercial banks in the Nepalese context. In conclusion, while customer and social capital significantly enhance firm performance in Nepalese banks, human and structural capital appear to have limited impact. These findings highlight the need for targeted strategies to strengthen human and structural capital utilization to maximize their potential contribution to organizational success.

Nepal is a developing country with enormous human resource potential that can be very beneficial to the country's future growth. Human resources are the most valuable resources in many developed countries. In Nepalese organizations, intellectual capital is a relatively recent notion. Nepalese culture has a very poor and weak intellectual capital orientation. This study could be highly implacable for future study for making concept of intellectual capital and further improvement. It may be a valuable piece of research work for academicians, practitioners, and the management body of any concerned organizations.

Author contribution statement

Udaya Kumar Shrestha: Conceptualization, methodology, data analysis and writing; **Sudip Wagle:** Data analysis and writing. All author(s) involved in addressing the comments, revision of the paper and finalization of manuscript.

Funding

There is no funding support for this study.

Declaration statement

The authors declare no conflict of interest.

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