

Unraveling the Brain Drain Dilemma: Analysis among Skilled Information Technology Professionals of Nepal

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ABSTRACT

This research explores the phenomenon of brain drain among skilled IT professionals in Nepal, aiming to understand the factors influencing their migration decisions. In a globalized context, the study focuses on the challenges faced by Nepal's IT workforce and their motivations for migration. Using a robust methodology with 185 IT professionals, a multiple regression model is applied, incorporating variables like Employment Prospects, Economic Uplifts, Education, and Personal Ambition, with Brain Drain as the dependent variable. Linear regression's simplicity is chosen for clarity. Significant correlations between these variables and Brain Drain are found, supported by strong Pearson correlation coefficients. Four hypotheses confirm the impact of Employment Prospects, Economic Uplifts, Education, and Personal Ambition on Migration Intention. The study underscores the financial factors' dominant role in migration patterns within the IT industry, offering valuable insights for policymakers and industry leaders to formulate targeted strategies for talent retention. This research advocates for further discourse on the multifaceted challenges of brain drain, promoting informed decision-making and effective interventions for the sustainable growth of Nepal's IT sector.

Keywords: Brain Drain, Skilled workforce, Employment, Education, Ambition, Global talent mobility.

Introduction

Brain drain, the ebrain drain of highly educated and skilled individuals from less economically advanced countries to more developed ones, has become a significant concern for nations like Nepal. The loss of skilled human resources due to brain drain has adverse effects on the home country, such as a shortage of qualified professionals, reduced innovation, and loss of the country's investment

in education and health sectors (Mishra, Ghimire and Aithal, 2023). While brain drain brings some positive aspects, such as increased remittances and the acquisition of new skills and technologies, its overall impact on the nation is a cause for concern. Addressing the issue of brain drain is crucial for Nepal's sustainable development and requires a comprehensive understanding of its causes and consequences (Mishra, 2023a).



The rapid development of new information technologies has ushered the world into society 5.0, significantly transforming interaction with machine (Mishra, 2023b). This evolution has also led to a shift in the role of computers in enterprise management and the methods of industrial advancement in Industry 4.0 automation, emphasizing data integration, visualization, and intellectual support (Martynov, Shavaleeva, & Zaytseva, 2019) and it is also applicable in Agriculture (Mishra, Nepal & Aithal, 2022).

The field of Information Technology (IT) has witnessed unprecedented growth, attracting a growing number of individuals globally, including in Nepal. The increasing job security and high-paying Prospectus have made IT a popular choice among Nepali students. The availability of diverse and recognized IT courses, coupled with the rising number of IT companies in Nepal, has further bolstered the appeal of the IT sector.

The influence of information technology as a competitive advantage is widely acknowledged, yet there remains a lack of understanding regarding its impact on organizations and the coordination of technology and corporate strategy (Bakos & Treacy, 1986).

The economic success of the IT industry in countries like India and China has sparked discussions about its potential to revitalize the economy of cities in developing countries, including South Africa (Das, 2019).

IT professionals are considered highly skilled manpower with a multidisciplinary impact on various sectors such as communication, transportation, medicine, engineering, and governance. Their role is crucial for the overall development of a country, particularly in developing nations like Nepal, where their contribution to technological advancement and economic growth is significant. However, the IT sector in Nepal has been experiencing a brain drain, with a growing number of IT graduates seeking Prospectus abroad, drawn by the high demand for skilled IT professionals in developed countries.

The trend of skilled IT professionals leaving Nepal for Prospectus in foreign countries is attributed to the perceived ease of securing employment abroad, the international standard of education and training in Nepal, and the welcoming policies of developed countries for IT professionals. This trend has led to increased "headhunting" of IT professionals from developing countries by multinational companies, further fueling the ebrain drain of IT talent from Nepal (Shrestha, 2017).

Problem Statement

The IT sector in Nepal, a rapidly growing and significant service and commercial sector, has experienced a concerning trend of skilled professionals migrating to foreign countries. While numerous studies have explored the ebrain drain of Nepalese manpower and its effects, a gap exists in understanding the brain drain intentions of IT professionals and the factors driving this phenomenon (Shrestha, 2017). This research aims to bridge this gap by conducting an in-depth study of the trends and causes of IT professional brain drain in Nepal.

The lower level of socio-economic development in Nepal, the cultural and educational dominance of foreign countries, and the comparatively higher wages in foreign currency are among the major reasons for IT professionals' brain drain (Mainali, 2019). Additionally, the security of jobs, benefits associated with the job, and the exposure to international working conditions are factors that attract IT professionals to foreign countries (Shrestha, 2017).

This research will be of great importance to policymakers, academics, and industry professionals, as it will provide a clear understanding of the current scenario and the factors that influence IT professional brain drain in Nepal. By addressing this gap in the existing literature, this research will contribute to the development of targeted strategies to mitigate the problem of IT professional ebrain drain in Nepal.

Research Objective

The objective of this research is to analyze the phenomenon of brain drain among skilled Information Technology professionals in Nepal, with a focus on identifying the factors that influence their decision to migrate to foreign countries.

Literature Review

The comprehensive review provides a nuanced understanding of the challenges and Prospectus in the IT education and industry sectors in Nepal. It emphasizes the impact of global trends, policy frameworks, and economic factors on the brain drain patterns of professionals, especially in the IT sector. The identified research gap underscores the necessity for targeted investigations into the specific dynamics of IT professional brain drain in Nepal to inform future policy decisions and interventions.

Shrestha et al. (2007) shed light on the historical development of higher education in Nepal, emphasizing the shift towards theoretical rather than practical knowledge. The inadequacy of the Nepalese education system in preparing students for the professional world is underscored, leading to a brain drain phenomenon. The discussion highlights the disconnect between education in Nepal and global standards, attributing the increasing number of students leaving the country to seek quality education abroad. The role of information and communications technology (ICT) in education is also explored, with an emphasis on its symbolic and ideological significance rather than its practical utility (Phuyal, 2018; Shields, 2011). The improvements have been suggested (Mishra & Jha, 2023).

This section discusses the exponential growth of the IT industry globally and its impact on Nepal. The demand for IT professionals is outlined, leading to a surge in IT-related courses. The transformative effect of the IT revolution on various aspects of life is acknowledged, with a specific focus on the global nature of the industry. The Prospectus in the IT sector, both domestically and through outsourced work, contribute to the attraction of students and professionals. The section concludes with recommendations for enhancing the overall

quality of IT education in Nepal (Shakya & Rauniar, 2017).

The segment delves into the current employment scenario in Nepal, particularly focusing on computer engineering, nursing, and agriculture graduates. It identifies potential job Prospectus in foreign and domestic markets for these graduates, with a notable emphasis on the role of government institutions in improving employability. The dissatisfaction among graduates with their employment, attributed to factors such as low salaries, political instability, and corruption, underscores the challenges faced by the workforce. Several studies highlight the inclination of professionals, including IT experts, to migrate due to economic, political, and personal reasons (Basnet & Kim, 2010; Paudel, 2018; Kattel & Sapkota, 2018; Chen, 2017).

The review identifies a significant research gap related to the brain drain of IT professionals in Nepal. While there is ample research on brain drain in the country, specific attention to the causes and consequences within the IT sector is lacking. The need for a focused study to understand the unique factors influencing the brain drain of IT professionals is highlighted as a critical research gap that requires attention (Baral & Sapkota, 2015; Sapkota, 2014).

Methodology

Research Design

A descriptive and explanatory research design was employed for this study, relying on primary survey data. The primary data was collected through self-administered questionnaires distributed to respondents via email. In addition to the questionnaire, expert opinions were sought to complement the research findings (Phuyal, 2018; Shields, 2011).

Type of Study

The study employed various statistical tests such as correlation, regression, mean, and standard deviation. Statistical Package for Social Science (SPSS) was utilized for the quantitative data analysis. Cronbach's alpha was employed for assessing the reliability of scales, ensuring the consistency of multiple scale items (Shakya & Rauniar, 2017).

Description of Population and Sample

A survey method was utilized, and a sample of 185 respondents was selected using convenience sampling from those who were coming in consulting services. The sample represented the entire population of IT professionals (Baral & Sapkota, 2015; Sapkota, 2014).

Data Source

Primary data was collected directly from respondents through a structured questionnaire. Secondary sources were used for studying past trends. The primary data collection involved self-administered questionnaires distributed through schedule a high level of accuracy (Sapkota, 2014).

Instrumentation

The primary data collection instrument was a self-administered questionnaire consisting of closed-ended questions related to study variables. The Likert scale, with a range from 'Strongly Disagree' to 'Strongly Agree,' was used. The questionnaire included demographic information and Likert-scale measurement questions for variables. The conceptual framework was developed based on secondary data, and the primary data collection tool was the questionnaire (Sapkota, 2014).

Data Collection Procedures

Structured questionnaires were prepared and distributed to respondents through mail and social media. The data collection involved personal networks and convenience sampling. The collected data were analyzed using mathematical tools, and the results were presented in tables and charts for clarity. Conclusions were drawn from the analysis of findings (Sapkota, 2014).

The feedback from the pilot study was used to refine the questionnaire, ensuring clarity and avoiding misinterpretations.

Reliability and Validity

Validity and reliability were addressed through careful selection of questions and the use of Cronbach’s alpha. The questionnaire's reliability was confirmed through Cronbach’s alpha calculations, ensuring a value above 0.7 for all variables, indicating reliability (Sapkota, 2014).

Analysis Plan

The collected data were analyzed using SPSS. Descriptive statistics such as mean and standard deviation were used for the initial analysis. Correlation and regression analyses were conducted to determine relationships between variables and build predictive models. The regression model included variables such as employment prospectus , financial factors, education, and personal ambition to predict brain drain among IT professionals. The reliability of the model and the presence of multicollinearity were also assessed (Sapkota, 2014).

Results and Discussion

Descriptive Statistics of Personal Ambition for Brain Drain Among IT Professionals (185 Respondents):

Personal ambition, the first independent variable in this research, was assessed using a five-point Likert Scale with responses collected from 185 IT professionals. Descriptive statistics for each statement are presented below:

Table 1: Descriptive Statistics of Personal Ambition on Brain Drain Among IT Professionals in Nepal

Code	Statement	N	Mean	SD
P1	To gain more exposure for career development	185	3.4	0.97
P2	To gain hands-on skills with new trends and technology	185	3.9	0.95
P3	Permanent Brain Drain	185	3.8	0.87
P4	To work with highly skilled IT professionals	185	3.5	1.12
P5	For personal freedom and explore the world	185	3.95	0.67
Personal Ambition		3.71	0.92	

Table 1 displays the descriptive statistics of personal ambition concerning the brain drain among IT professionals in Nepal. The mean values range from 3.40 to 3.95, indicating an inclination towards agreement. The highest mean for P5 suggests that the maximum respondents migrate due to personal freedom, while the lowest mean for P1 indicates fewer respondents are motivated by exposure for career development. Standard deviations reveal varying levels of agreement among respondents, with P4 having the highest deviation.

The aggregate mean of Personal Ambition is 3.71, suggesting that respondents generally agree that personal ambition may impact the brain drain of IT professionals in Nepal.

Descriptive Statistics of Economic uplift s for Brain Drain among IT Professionals (185 Respondents)

Economic uplift s, another independent variable, were assessed using responses from 185 IT professionals. Descriptive statistics for each statement are presented below:

Table 2: Descriptive Statistics of Economic uplifts on Brain Drain among IT Professionals in Nepal

Code	Statement	N	Mean	SD
F1	To perceive higher earnings	185	3.95	0.87
F2	For a better standard of living	185	4.2	0.93
F3	To ensure family financial stability	185	3.6	0.91
F4	To break the cycle of poverty	185	3.9	1.18
Economic Uplift s		3.96	0.9	

Table 2 exhibits the descriptive statistics of Economic uplift s concerning the brain drain among IT professionals in Nepal. The mean values range from 3.60 to 4.20, indicating an inclination towards agreement. The highest mean for F2 suggests that the maximum respondents feel brain drain is for a better standard of living, while the lowest mean for F3 indicates agreement that migrants are less likely to migrate for family financial stability. Standard deviations reveal varying levels of agreement among respondents, with F4 having the highest deviation.

The aggregate mean of Economic uplift s is 3.96, indicating an inclination towards agreement.

Descriptive Statistics of Employment Prospectus for Brain Drain Among IT Professionals (185 Respondents)

Employment prospectus , another independent variable, was assessed using responses from 185 IT professionals. Descriptive statistics for each statement are presented below:

Table 3: Descriptive Statistics of Employment Prospectus on Brain Drain Among IT Professionals in Nepal

Code	Statement	N	Mean	SD
O1	Due to unemployment in Nepal	185	3.9	0.8
O2	Expectation of a highly recognized job	185	4.2	0.9
O3	Limited challenging job Prospectus in Nepal	185	3.5	0.9
O4	To explore diversified work culture	185	3.9	1.2
O5	To work on big tech giants	185	4.1	0.5
Employment Prospectus		3.92	0.9	

Table 3 exhibits the descriptive statistics of employment prospectus concerning the brain

drain among IT professionals in Nepal. The mean values range from 3.50 to 4.20, indicating an

inclination towards agreement. The highest mean for O2 suggests that the maximum respondents feel professionals migrate due to the expectation of a highly recognized job, while the lowest mean for O3 indicates agreement that limited challenging job Prospectus in Nepal influence brain drain the least. Standard deviations reveal varying levels of agreement among respondents, with O4 having the highest deviation.

The aggregate mean of Employment Prospectus is 3.89, indicating an inclination towards agreement.

Descriptive Statistics of Education for Brain Drain Among IT Professionals (185 Respondents)

Education, another independent variable, was assessed using responses from 185 IT professionals. Descriptive statistics for each statement are presented below:

Table 4: Descriptive Statistics of Education on Brain Drain Among IT Professionals in Nepal

Code	Statement	N	Mean	SD
E1	To pursue a more practical and advanced university degree	185	4.1	0.95
E2	Nepal has a limited field of studies	185	3.7	0.9
E3	No suitable jobs in Nepal to recognize my degree	185	3.65	1.16
E4	To gain a global mindset	185	4.2	0.6
Education		3.89	0.91	

Table 4 exhibits the descriptive statistics of education concerning the brain drain among IT professionals in Nepal. The mean values range from 3.65 to 4.20, indicating an inclination towards agreement. The highest mean for E4 suggests that the maximum respondents feel IT professionals choose to migrate to gain a global mindset, while the lowest mean for E3 indicates agreement that brain drain is not primarily influenced by the absence of suitable jobs in Nepal to recognize their degree. Standard deviations reveal varying levels

of agreement among respondents, with E3 having the highest deviation.

The aggregate mean of Education is 3.71, indicating an inclination towards agreement.

Descriptive Statistics of Brain Drain

Brain drain intention, the dependent variable, was assessed using responses from 185 IT professionals. Descriptive statistics for each statement are presented below:

Table 5: Descriptive Statistics of Brain drain Intention

Code	Statement	N	Mean	SD
MI1	My current job does not provide enough prospectus to achieve personal ambition	185	3.8	0.87
MI2	For financial stability, IT professionals migrate abroad	185	3.9	0.83
MI3	I am not satisfied with employment Prospectus in Nepal	185	3.8	1.17
MI4	Salary in Nepal does not meet my financial expectations	185	3.7	0.9
Brain drain Intention		3.78	0.94	

Table 5 exhibits the descriptive statistics of brain drain among IT professionals in Nepal. The mean values range from 3.70 to 3.90, indicating an inclination towards agreement. The highest mean for MI2 suggests that people intend to migrate for financial stability, while the lowest mean for MI4

indicates agreement that they consider migrating not so much because of a low salary in Nepal. Standard deviations reveal varying levels of agreement among respondents, with MI3 having the highest deviation.

The aggregate mean of Brain drain is 3.78, indicating an inclination towards agreement.

Correlation Analysis of Brain Drain among IT Professionals

In this section, the correlation between independent variables (Employment Prospectus , Economic

uplift s, Education, and Personal Ambition) and Brain Drain as the dependent variable is explored. A sample of 185 IT professionals is used, and a significance level of 0.01 is employed. If the p-value is less than α (0.01), the correlation coefficient is considered significant.

Table 6: Correlation Analysis

Variables	Pearson Correlation	Sig. (2-tailed)	N
Employment Prospectus	0.648**	0.000	185
Economic uplift s	0.724**	0.000	185
Education	0.646**	0.000	185
Personal Ambition	0.647**	0.000	185

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

Relation between Brain Drain and Employment Prospectus

Table 6 reveals a correlation coefficient of 0.648 between Employment Prospectus and Brain Drain, indicating a strong positive relationship. The p-value (0.000) is less than alpha (0.01), signifying a significant relationship between Employment Prospectus and Brain Drain ($r=0.648, P=0.000 < 0.01$).

Relation between Brain Drain and Economic Uplifts

Table 6 displays a correlation coefficient of 0.724 between Economic uplift s and Brain Drain, indicating a robust positive relationship. The p-value (0.000) is less than alpha (0.01), demonstrating a significant relationship between Economic uplift s and Brain Drain ($r=0.724, P=0.000 < 0.01$).

Relation between Brain Drain and Education

Table 6 exhibits a correlation coefficient of 0.646 between Education and Brain Drain, signifying a substantial positive relationship. The p-value (0.000) is less than alpha (0.01), establishing a significant relationship between Education and Brain Drain ($r=0.646, P=0.000 < 0.01$).

Relation between Brain Drain and Personal Ambition

Table 6 indicates a correlation coefficient of 0.647 between Personal Ambition and Brain Drain, revealing a strong positive relationship. The p-value (0.000) is less than alpha (0.01), affirming a significant relationship between Personal Ambition and Brain Drain ($r=0.647, P=0.000 < 0.01$).

Regression Analysis Results for Brain Drain Among IT Professionals

In this section, a multiple regression model was applied to determine the relationship between various factors influencing brain drain (brain drain intention) of IT professionals in Nepal. The simplicity, interpretability, scientific acceptance, and widespread availability of linear regression make it a suitable choice for this analysis.

Multiple Regression Model

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

Where,

- Y = Brain Drain
- X₁ = Employment Prospectus
- X₂ = Economic uplift
- X₃ = Education
- X₄ = Personal Ambition
- β₀ = Constant
- ε = Error term

Table 7: Model Summary

R	R2	Adjusted R2	Std. Error of the Estimate
0.824	0.679	0.673	0.34632

Table 7 provides the model summary, indicating a strong positive correlation (R=0.824) between the dependent variable (Brain drain) and all independent variables. The coefficient of determination (R2) is 0.679, signifying that 67.9%

of the variation in Brain drain is explained by the independent variables. The adjusted R2 is 0.673, considering the degree of freedom, and the standard error of estimate is 0.34632.

Table 8: Regression ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 (Regression)	117.722	4	23.544	136.164	0
Residual	40.462	225	0.173	-	-
Total	158.184	229	-	-	-

Table 8 presents the ANOVA results, showing that the regression model is significant at a 5% level of significance (p=0.000<0.05). Therefore, the

multiple linear model can effectively analyze the data.

Table 9: Coefficients of Regression Model

Model	Unstandardized Coefficients	Standardized Coefficients (Beta)	t	Sig.	Sig.
Constant	-0.12	-	-0.7	0.51	0
Employment Prospectus	0.237	0.2641	5.02	0.0001	-
Economic uplift	0.453	0.45	8.65	0.0001	-
Education	0.118	0.116	2.01	0.0401	
Personal Ambition	0.196	0.192	3.62	0.0001	

Table 9 displays the coefficients of the regression model, providing insights into the contribution of each independent variable to the dependent variable (Brain drain). The regression equation is formed as follows:

$$\text{Braindrain}(\text{est.}) = -0.124 + 0.237\text{Employment Prospectus} + 0.453\text{Economics} + 0.118\text{Education}$$

+ 0.196 Personal Ambition

The results indicate that all four independent variables have a positive impact on Brain drain.

Hypothesis Testing: The study tested four hypotheses based on the significance values of the independent variables:

Table 10: Significance Value of Independent Variable

Independent Variables	B	Sig.
Employment Prospectus	0.237	0.0001
Economic	0.453	0.0001
Education	0.118	0.0401
Personal Ambition	0.196	0.0001

Table 11: Summary of Hypothesis Test (Table 4.22)

Hypothesis	Conclusion
Employee Prospectus – Brain Drain	Accepted
Economic uplift s – Brain Drain	Accepted
Education – Brain Drain	Accepted
Personal ambition – Brain Drain	Accepted

The analysis concludes that all four hypotheses are accepted, indicating that Employment Prospectus, Economic uplifts, Education, and Personal Ambition have a significant impact on Brain Drain among IT professionals in Nepal.

Correlation analysis demonstrated strong positive relationships between all independent variables and brain drain intention, with all significance levels below 0.01. Regression analysis provided a comprehensive model summary, ANOVA results indicating model significance, and coefficients highlighting the contributions of each variable.

Hypothesis testing confirmed the significant impact of Employment Prospectus, Economic uplift s, Education, and Personal Ambition on brain drain among IT professionals in Nepal. These results align with existing literature, emphasizing the economic and work environment, financial motivations, educational Prospectus, and personal aspirations as influential factors in professionals' decisions to migrate. The conformation assures strongly the assumption of Silwal (2019):Panagiotakopoulos, (2020) and Mishra,(2023). Ethical capital formation may help to reduce drain through good governance (Mishra and Aithal, 2023: Bhagat, Mishra, & Aithal, 2022).

While the findings are robust, the sample size of 185 respondents may limit the generalizability of the results. Further research with a larger and more diverse sample could provide a more conclusive understanding of the factors influencing brain drain among IT professionals in Nepal.

Conclusions

The study provides valuable insights into the factors influencing brain drain, among this demographic. The study focused on four independent variables - Employment Prospects, Economic, Education,

and Personal Ambition - with Brain Drain as the dependent variable. The statistical analysis, employing a multiple regression model, revealed significant and positive relationships between all independent variables and Brain Drain, as indicated by their Pearson correlation coefficients.

Hypothesis Testing: The research formulated and tested four hypotheses based on the aforementioned variables. The results showed that all four hypotheses (H1 to H4) were accepted. The statistical significance of the coefficients (B) and low p-values (all less than 0.05) underscored the substantial impact of Employment Prospectus, Economic, Education, and Personal Ambition on Brain Drain among IT professionals in Nepal.

- **H1 (Employment Prospectus):** The study confirmed a significant impact, with IT professionals showing a propensity to migrate based on better employment opportunities.
- **H2 (Economic):** Economic Uplift factors emerged as a dominant influence, with a noteworthy impact on Migration Intention.
- **H3 (Education):** The pursuit of education was identified as a contributing factor, signifying its role in the decision-making process of IT professionals.
- **H4 (Personal Ambition):** Personal Ambition, too, was found to significantly impact Brain Drain, highlighting the role of individual aspirations in migration decisions.

Overall Impact: The aggregate mean value of Brain Drain suggested a prevalent inclination towards agreement among IT professionals. Thus, the study concludes that the Brain drain of IT professionals in Nepal is influenced by the interplay of Employment Prospects, Economic uplift, Education, and Personal Ambition.

This research prompts further discussions on the identified factors, fostering a deeper understanding of the ongoing brain drain phenomenon in the country.

Managers can use these findings to make informed decisions and devise strategies to address the challenges posed by brain drain. For instance, governmental authorities can formulate policies that motivate the IT sector, reduce the outflow of skilled personnel, and create an environment conducive to retaining talent.

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