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BRIDGING SYSTEMS AND PRACTICE: INSIGHTS FROM NEPAL'S FRONTLINES OF HEALTH, EDUCATION, AND FINANCE

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This twice-a-year South Asian edition of JORI pulls together studies that get right into practice. You know the kind. Stuff happening at hospital bedsides and in classrooms. Or in bank boardrooms and public offices. And even in homes where folks make daily choices as the economy shifts around them. Most of the work here is grounded in Nepal. Still, their points reach across South Asia's common hurdles. Things like lining up policy goals with what actually happens in the field. Or building stronger institutions. And turning solid evidence into outcomes that feel fair for everyone.

We start off with a look at health systems. It comes from the intensive care side of things. Acharya, Pandey, and Shrestha lay out how nurses' views and knowledge on end-of-life care point to bigger readiness in organisations. They want humane care that's based in those critical spots. Their survey-style study shows mostly good attitudes. But knowledge sits at moderate levels. Training and the setup in institutions come up as key factors. For teams led by anaesthesia folks, the takeaway works in real ways. Fold end-of-life care into teaching plans. Set standard protocols. And work together on training that mixes disciplines. Make it part of daily flows in ICUs and HDUs. The thing is, it reminds us that compassion grows when you make it part of the operations.

On a bigger population scale, Joshi and team dig into national data. They map out patterns in hypertension by social demographics and link it to tobacco use. The patterns they spot run along lines of age, education, wealth, and geography. It all drives home the need to tie tobacco controls with spotting and handling hypertension. Prevention works best when you tackle risk factors as groups. Not as separate boxes.

Shifting to methods that prep for future outbreaks, Kumar and Yadav bring in transition matrices. They act as a simple frame for grasping how viruses mutate over time. For students and folks just starting in research, this piece serves as a short link. It connects math ideas to choices in public health. Shows how number crunching tools help get ready when data gets messy and time runs low.

Three pieces look hard at the ongoing gap between intentions and what actually gets done in education. Tripathi and others point out that Nepal's science curriculum aims for learner-centred approaches. But too often it turns into straight teaching from books. Teachers read textbooks out loud. Hands-on work is rare. Plans barely focus on kids' needs. Rai and team zero in on English as the medium of instruction in Ilam. They capture the real human side of the mismatch. Teachers deal with low skills in the language, not enough training, and scarce resources. Students wrestle with the language, their own confidence, and understanding it all. Schools lack the overall backing. Aryal does a collaborative autoethnography from an IB world school. It offers a different angle and adds to the picture. Things like inquiry methods, clear criteria, and a common language for skills can build real agency and thinking about thinking. But heavy workloads, spotty rollout, and high costs all risk leaving some out. Taken as a set, these studies push for changes in how we assess. Like coaching for teachers, cheap hands-on activities, and mobile labs. Specific training for English medium setups. And paths that focus on fairness, adapting strong IB habits to all kinds of schools.

Studies on the financial side give a longer-term and side-by-side view. Aryal and co look back historically at two big commercial banks from the late 2000s. They show how good governance and careful loan

checks turn deposits into smart lending and steady profits. Mukhiyas work on capital setup and bank earnings breaks it down more. Leverage, bank size, how liquid they are, and capital levels all play roles. But not the same way across different ownership types. It highlights why you need custom rules for safety and management. Lamsal and Soneja use an ARDL setup from 2001 to 2024. They find remittances link positively and strongly to financial savings. That carries ideas for policies on official channels and getting more into savings. Sapkota and Sonejas look at macro banking stands out. In Nepal, inflation and GDP growth don't show a real impact on one-year fixed deposit rates. Not over ten years of quarterly numbers anyway. It points to the weak pass-through of the money policy via this tool. So maybe spread out bank funding sources. Give savers more choices beyond short-term fixed deposits.

Markets and home life show up again in Karki, and the teams review buying two-wheelers in Kathmandu. Fuel savings and ways to finance decide a lot. Brand and looks count too. But gaps in info stick around. For companies, the way ahead means being understanding and good with data. Link new finance options to straightforward info on products. Design with real limits in mind, like traffic jams and ongoing costs.

Public results depend on public setups in the end. Khanal and Sonejas take on leadership in Nepal's public companies, spotting usual blocks. Too much bureaucracy, politics meddling, and management that reacts instead of plans. They suggest a blend of reforms. Appointments based on merit. Growth for leaders. And better ways to hold people accountable. In the constitution area, Pulami Magars' overview checks presidential and semi-presidential setups for Nepal. The take stays careful. Good design for institutions can help stability. But without fixes to parties, a strong rule of law, and trust from people, any setup might just repeat old problems in fresh spaces.

Across fields, a few themes keep coming back:

(ι) Capability matters more than just wanting it. At the end of life protocols or science inquiry or bank risk setups, intentions only land when skills, pushes, and routines line up. Training by itself doesn't cut it. You need coaching, watching over, and feedback that turns learning into regular habits.

(ιι) Design with fairness and what's doable in mind. English medium without building up teachers step by step, IB style checks without easing into it, and hypertension handling without quitting tobacco each show how half steps can make divides worse. Policies ought to build in supports that watch costs and accountability that reach the classroom, clinic, and bank branch.

(ιιι) Measure the right things, then handle them. From those transition matrices to ARDL models and bank number breakdowns, this issue highlights ways to make tough stuff into clear signs. The call is to make that kind of measuring standard in government offices, school networks, hospitals, and banks.

(ιϖ) Pay attention to where things connect. Health links to ethics in the ICU. Curriculum ties to checking in class. Deposits meet risk-taking in banks. Leadership hits legitimacy in public companies. The strongest fixes happen right at those joins.

As a journal for South Asia, JORI aims to spotlight solid work that's tuned to the place. Work that talks across areas. We thank our writers for sticking with it. Reviewers for tough but helpful notes. And readers who take the evidence to real use. Hope this collection helps doctors tweak ICU steps, teachers set up next classes, bankers weigh growth against caution, officials shape setups, and families pick wisely.

From the Editorial Board, we welcome more pieces that keep these talks going. Like mixed method checks on school and health changes. Or near experiments and time-based looks at finance and policy. Research on putting designs into practice that balance doability with staying true. And short notes on methods that make advanced tools open to local fixes. Our areas' problems overlap. So can the lessons we draw.

-City Education Foundation, Kathmandu, Nepal

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SYSTEM-LEVEL BARRIERS TO END-OF-LIFE CARE INTEGRATION IN CRITICAL CARE UNITS: A CROSS-SECTIONAL STUDY INFORMING ANAESTHESIA-LED INTERVENTIONS

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ABSTRACT

***Introduction:** End-of-Life Care (EOLC) is given to patients until their final days and hours of life. Nurses' knowledge and attitudes play an essential role in delivering successful and efficient EOLC. Framed within intensive care contexts, this study uses nurse-level knowledge and attitude as proxy indicators of organisational readiness and system-level barriers to integrating EOLC in intensive care units (ICUs) and high-dependency units (HDUs), with implications for anaesthesia-led interventions.*

***Methods:** In July 2024, a cross-sectional study was carried out among 124 nurses selected via non-probability proportionate quota sampling from Bir Hospital and National Trauma Center. A self-administered structured questionnaire assessed knowledge and attitude towards end-of-life care. Chi-square tests examined associations of knowledge and attitude with selected variables, and Spearman's rank correlation assessed the correlation between knowledge and attitude.*

***Results:** The highest proportion (37.9%) of participants had a moderate level of knowledge, and most (88.7%) had a positive attitude regarding end-of-life care, with mean scores of 24.47 ± 7.487 and 106.14 ± 17.788, respectively. Knowledge showed associations with working experience, hospital, and training; attitude showed an association with ethnicity. Knowledge and attitude were weakly correlated ($r = 0.274$, $p = 0.002$). Taken together, limited formal training and institution-related differences indicate system-level barriers to consistent EOLC integration in critical care units.*

***Conclusion:** While most nurses demonstrated positive attitudes, the predominance of only moderate knowledge and the dependence of knowledge on training and institutional context point to organisational gaps that impede EOLC integration. The study highlights the need to integrate EOLC into curricula and to conduct educational interventions and training enabling nurses to deliver EOLC effectively. These results provide actionable, system-level insights for anaesthesia-led strategies, such as ICU protocol development, interdisciplinary training, and workflow integration, to embed EOLC within critical care.*

***Keywords:** End of life care; Knowledge; Attitude; Hospital; Nurses; Anesthesia; Anesthesiology; Critical care*

INTRODUCTION

End-of-life care (EOLC) comprises the physical, psychosocial, and spiritual support provided to people in their final days and hours, with the goals of comfort, dignity, and alignment with patient and family preferences (Nacak & Erden, 2022). In critical care settings, intensive care units (ICUs) and high-dependency units (HDUs), care trajectories frequently pivot from curative intent to comfort-focused goals, making EOLC integration a system responsibility rather than an individual task. Within this system, anaesthesiologists, who commonly lead ICU services, manage analgesia and sedation, and guide ventilator support and withdrawal, are well-positioned to champion structured, standardised EOLC and to align teams around shared goals of care (Bloomer & Butler, 2022).

The scale of need is substantial. Globally, the crude death rate is approximately 7 per 1,000 population, and a sizeable proportion of deaths occur in or after ICU care, underscoring the ICU as a crucial environment for improving EOLC (Nelson et al., 2006). In Nepal, the 2022 death rate was 6.7 per 1,000 population (World Data Atlas, 2022). Estimates suggest tens of millions require EOLC annually, yet only a fraction receive it (Harmer & Huffman, 2024). Cross-country comparisons of EOLC quality demonstrate large variation. Advance care planning, which supports people in articulating values and preferences, is increasingly recognised as a means to uphold autonomy and dignity near the end of life (Liu et al., 2020).

While the demand for EOLC is rising due to population ageing, increasing survivorship from non-communicable disease, and gains in life expectancy, persistent gaps in workforce preparation and institutional readiness impede high-quality EOLC. Studies describe unsatisfactory EOLC quality, inadequate knowledge, and discomfort with communication among health professionals, including ICU nurses (Agrawal et al., 2019; Ali et al., 2022; Hamdan et al., 2023; Lasater, 2020). Reported barriers include deficits in training and skills, emotionally challenging care, and misalignment between clinician attitudes and public expectations. Position statements emphasise that delivering high-quality EOLC in adult critical care requires clear policies, inter-professional education, and team coordination (Bloomer & Butler, 2022). International experiences (e.g., post-strategy improvements in the United Kingdom) further suggest that system-level levers can strengthen documentation, communication, and service delivery (Alshammari et al., 2022).

Nurses provide continuous bedside care and often are first to detect changes that warrant re-goal setting, making their knowledge and attitudes both determinants and reflections of organisational capacity (Nacak & Erden, 2022). In the South Asian context, including Nepal, formal training opportunities remain limited and institutional policies heterogeneous, which may produce variability in symptom control, communication, and family support at the end of life (Gurung & Timalsina, 2018; Parajuli et al., 2022).

Translating EOLC principles into ICU workflows, therefore, depends on organisational readiness: explicit triggers for palliative involvement, standardised assessment and documentation, reliable access to essential medications, protected time and skills for communication, and professional education (Bloomer & Butler, 2022). Where these features are weak or absent, nurses' knowledge

and attitudes can serve as practical proxies for system performance and culture. Patterns in these measures, and their associations with experience, unit type, training exposure, and institution, can reveal system-level barriers that anesthesiology-led services are uniquely able to address through governance, training, and protocol development.

Accordingly, this cross-sectional study assesses the knowledge and attitudes toward EOLC among nurses working in ICUs and HDUs of two tertiary centres in Nepal and examines their associations with selected demographic and work-related variables. By interpreting nurse-reported outcomes as indicators of organisational readiness, we aim to (i) characterise system-level barriers to EOLC integration within critical care units and (ii) generate actionable recommendations for anaesthesia-led strategies, such as ICU EOLC pathways, escalation/de-escalation checklists, advance care planning prompts, symptom-control bundles, and simulation-based communication training, to embed EOLC into routine ICU practice.

METHODS

Study design

We conducted a hospital-based cross-sectional study to assess nurse-level end-of-life care (EOLC) knowledge and attitudes in critical care and to interpret these measures as system-readiness proxies for anaesthesia-led integration. Reporting follows STROBE guidance.

Setting

The study took place at two tertiary, public hospitals in Kathmandu, Nepal: Bir Hospital (ICU-I, Respiratory ICU/HDU, Surgical ICU/HDU, JICA ICU, Gastro ICU, Neuro ICU, Cardiology ICU, Medical ICU) and the National Trauma Center (Trauma ICU/HDU). Nepal's first ICU was established at Bir Hospital.

Population and eligibility

The target population comprised registered nurses posted to ICUs/HDUs during data collection. Ward in-charges were eligible; nurses on study or maternity leave were excluded. Unit rosters supplied by nursing administration formed the sampling frame (Bir, n=115; National Trauma Center, n=46; total N=161).

Sample size

We estimated the sample using Cochran's formula $n=z^2pq/d^2$ with z=1.96 (95% confidence), p=0.385, q=0.615, and d=0.05, yielding n=363.83 (Cochran, 1963). Applying a finite population correction for N=161 produced n′=112; adding 10% for non-response gave a final target of 124.

Sampling strategy

Sampling used double stratification with proportional allocation by hospital (Bir, n=89; National Trauma Center, n=35) and then by unit within each hospital to preserve representation. Within unit-level quotas, participants were recruited by convenience (first-available eligible staff) until quotas were met.

Measures

Primary outcomes were (1) knowledge of EOLC, assessed by a researcher-developed, self-administered 15-item questionnaire (total score=39; correct=1, incorrect=0; multi-response items scored per correct option) categorized as Low (≤50%), Moderate (50–<80%), or High (≥80%), and (2) attitudes toward EOLC, measured using the 30-item Frommelt Attitudes Toward Care of the Dying (FATCOD) scale (5-point Likert; reverse scoring for negative items; total 30–150) categorized as Negative (<50%) or Positive (≥50%) of the maximum (Frommelt, 1991). Prespecified explanatory variables included age, ethnicity, education, years of experience, hospital, unit, prior EOLC training, academic coursework, recent bereavement exposure, and sources of information.

Instrument validity and reliability

Content and face validity for the knowledge tool were established by expert review and alignment with study aims; forward translation to Nepali and back-translation ensured semantic equivalence. FATCOD has demonstrated strong psychometrics (CVI≈0.98; test-retest r≈.94; ICC≈0.87; Cronbach's α≈.81-.83) and good practicability (Mastroianni et al., 2015; Frommelt, 1991).

Pretesting

The full instrument was pretested with 13 ICU nurses (~10% of the final sample) in a comparable unit (CTVS ICU, Bir Hospital). No substantive revisions were required; pretest participants were excluded from the main study.

Data collection

Following administrative approvals, data were collected 2080/03/17–2080/03/31 (Nepali calendar) via self-administered English questionnaires during break or shift-overlap periods to minimise service disruption. Investigators obtained written informed consent, maintained seating separation to reduce contamination, remained available for procedural clarifications, and checked completeness at collection. Average completion time was 20–30 minutes.

Data management and statistical analysis

Data were edited, coded, and double-entered into SPSS v20 with range checks. Descriptive statistics (frequencies, percentages, means, SD) summarised variables. Chi-square tests examined associations between outcome categories (knowledge, attitude) and explanatory variables. Spearman's rho assessed the correlation between continuous knowledge and attitude scores. Two-sided $p < .05$ denoted statistical significance. Results are presented in text and tables.

Ethics

Approvals were obtained from Bir Hospital Nursing Campus and the administrations of Bir Hospital and the National Trauma Center. Participation was voluntary with written informed consent, the right to withdraw, and assurances of confidentiality through de-identification and secure data handling. No incentives were provided, and no harm was anticipated.

RESULTS

Participant characteristics

A total of 124 ICU/HDU nurses participated (mean age 29.0 ± 6.19 years; range 20–54). Over half were 26–35 years (55.6%). Most identified as Brahmin/Chhetri (56.5%), followed by Janajati (34.7%). Educationally, 67.7% held a Bachelor's in nursing, 25.8% a PCL diploma, and 6.5% a Master's degree (Table 1).

Table 1. Socio-demographic characteristics (n=124)

Variable	Frequency	%
Age (years)		
20–25	44	35.5
26–35	69	55.6
36–45	7	5.6
46–55	4	3.2
Mean ± SD	*29.0 ± 6.193*	
Range	*20–54*	
Ethnicity		
Dalit	4	3.2
Janajati	43	34.7
Madheshi	5	4.0
Muslim	1	0.8
Brahmin/Chhetri	70	56.5
Others	1	0.8
Education		
PCL Nursing	32	25.8
Bachelor's in Nursing	84	67.7
Master's in Nursing	8	6.5

Work context and EOLC exposure

Mean total work experience was 6.0 ± 6.53 years; 37.9% had 1–5 years, and 24.2% had <1 year. Most respondents were from Bir Hospital (71.8%) vs National Trauma Center (28.2%). Marked training gaps were evident: 94.4% reported no prior EOLC training, and 55.6% had no coursework on EOLC. Recent bereavement exposure (past 2 years) was reported by 43.5%. Primary information sources included curriculum (72.6%) and health professionals (70.2%) (Table 2).

Table 2. Work-related and other variables (n=124)

Variable	Frequency	%
Experience (years)		
<1	30	24.2
1–5	47	37.9
5–10	26	21.0
10–15	12	9.7

15–20	4	3.2
>20	5	4.0
Mean ± SD	*6.0 ± 6.525*	
Hospital		
Bir Hospital	89	71.8
National Trauma Center	35	28.2
Prior EOLC training		
Yes	7	5.6
No	117	94.4
Course/classes on EOLC		
Yes	55	44.4
No	69	55.6
Bereavement in the past 2 years		
Yes	54	43.5
No	70	56.5
Sources of information*		
Curriculum	90	72.6
Health professionals	87	70.2
Mass media	69	55.6
Peers	66	53.2
Family	38	30.6

*Multiple response.

Knowledge about EOLC

Conceptual knowledge showed strengths in identifying quality domains (e.g., pain/symptom management, 93.5%), but limited understanding of advanced care planning timing (4.8% correct). Only 21.0% selected the precise definition of EOLC, and 34.7% recognised the EOLC–palliative care relationship. Most identified physicians/nurses (91.1%) and family (86.3%) as responsible groups (Table 3).

Table 3. Knowledge on EOLC concepts (n=124)

Item (correct options)	**Frequency**	**%**
Meaning of EOLC	26	21.0
EOLC-palliative care relationship	43	34.7
Domains of quality EOLC*		
Pain & symptom management	116	93.5
Strengthening relationships	90	72.6
Avoid prolongation of dying	79	63.7
Relieve the burden on others	73	58.9
Sense of control	57	46.0
“Good death” criteria*		
Free of avoidable distress (patient)	104	83.9
Clinical/cultural/ethical standards	69	55.6

Free of avoidable distress (family)	68	54.8
In accordance with patient/family wishes	49	39.5
Advance care planning timing	6	4.8
Groups responsible for EOLC*		
Physicians & nurses	113	91.1
Family members	107	86.3
Social workers/spiritual counsellors	83	66.9
Pharmacists/rehab therapists	77	62.1

*Multiple response.

Recognition of signs and care during the dying phase was mixed. Most identified unresponsiveness (83.9%), drowsiness (71.8%), and the need to prioritise comfort measures (91.1%). Knowledge gaps included the meaning of "death rattle" (56.5% correct) and dyspnea management with morphine (19.4%). Most endorsed opioids for pain control (86.3%) (Table 4).

Table 4. Knowledge on signs/symptoms and care at the end of life (n=124)

Item (correct options)	**Frequency**	**%**
Signs of imminent death*		
Unresponsiveness	104	83.9
Drowsiness	89	71.8
Decreased appetite	87	70.2
Noisy respiration	87	70.2
Terminal delirium	79	63.7
Increased sleeping	60	48.4
"Death rattle" = terminal secretions	70	56.5
Noisy respiration: correct statements*		
Suction can remove trapped secretions	98	79.0
Turn the head to the side assists drainage	92	74.2
Patient cannot clear secretions	89	71.8
May indicate approaching death	46	37.1
Integral for pain management: opioids	107	86.3
Focus near death: are comfort measures	113	91.1
Dyspnea is commonly managed with morphine	24	19.4
Areas of need addressed (full set)	46	37.1
Spiritual needs: selected actions*		
Family/friends talk about the relationship	102	82.3
Be present/listen	90	72.6
Provide touch	81	65.3
Social worker/counsellor visit	75	60.5

*Multiple response.

Aggregated knowledge levels showed Moderate in 37.9%, Low in 35.5%, and High in 26.6% (mean 24.47 ± 7.49, range 8–36) (Table 5).

Table 5. Overall knowledge level (n=124)

Level	Frequency	%
Low	44	35.5
Moderate	47	37.9
High	33	26.6
Mean ± SD	*24.47 ± 7.487*	
Range	*8–36*	

Attitudes toward EOLC

Most nurses demonstrated a Positive overall attitude on FATCOD (88.7%; mean 106.14 ± 17.79, range 54–128) (Table 6).

Table 6. Overall attitude level (FATCOD) (n=124)

Level	Frequency	%
Positive	110	88.7
Negative	14	11.3
Mean ± SD	*106.14 ± 17.788*	
Range	*54–128*	

Subscales indicated Fair attitudes toward patients (64.5%; mean 68.52 ± 10.75) and Good attitudes toward families (58.1%; mean 37.62 ± 8.03) (Table 7).

Table 7. Attitude subscales: patient and family (n=124)

Subscale & level	Frequency	%
Toward patient		
Poor	12	9.7
Fair	80	64.5
Good	32	25.8
Mean ± SD (20–100)	*68.52 ± 10.747*	
Range	*37–84*	
Toward family		
Poor	14	11.3
Fair	38	30.6
Good	72	58.1
Mean ± SD (10–50)	*37.62 ± 8.032*	
Range	*15–50*	

Associations between knowledge and attitude

Knowledge level was significantly associated with working experience (χ^2=16.556, p=0.011), hospital (Bir vs NTC; χ^2=8.137, p=0.017), and prior EOLC training (χ^2=7.388, p=0.025). No significant associations were observed for age, ethnicity, education, coursework exposure, or recent bereavement (Table 8).

Table 8. Association between knowledge level and selected variables (n=124)

Variable	χ^2	p
Age (≤30 vs >30)	0.068	0.966
Ethnicity	4.560	0.335
Education (PCL vs ≥Bachelor)	1.336	0.513
Working experience	16.556	0.011*
Hospital (Bir vs NTC)	8.137	0.017*
Prior EOLC training (Yes/No)	7.388	0.025*
Coursework on EOLC (Yes/No)	4.964	0.084
Bereavement in the past 2 years (Yes/No)	1.289	0.525

*p<.05.

Attitude level was significantly associated with ethnicity (χ^2=7.591, p=0.022); other variables, including hospital, experience, and training/coursework, were not significant (Table 9).

Table 9. Association between attitude level and selected variables (n=124)

Variable	χ^2	p
Age (≤30 vs >30)	0.342	0.559
Ethnicity	7.591	0.022*
Education (PCL vs ≥Bachelor)	1.094	0.296
Working experience	2.957	0.398
Hospital (Bir vs NTC)	0.001	0.976
Prior EOLC training (Yes/No)	0.066	0.797
Coursework on EOLC (Yes/No)	3.361	0.067
Bereavement in the past 2 years (Yes/No)	0.394	0.530

*p<.05.

Correlation between knowledge and attitude

Knowledge and attitude scores were positively correlated (Spearman's ρ=0.274, p=0.002), indicating that higher knowledge modestly aligned with more positive attitudes (Table 10).

Table 10. Correlation between knowledge and attitude (n=124)

Variable	Knowledge	Attitude
Knowledge	1	0.274
Attitude	0.274	1

*p<.01 (two-tailed).

DISCUSSION

Among ICU/HDU nurses in two tertiary hospitals, overall knowledge of end-of-life care (EOLC) clustered at a *moderate* level (37.9%), while attitudes were predominantly *positive* (88.7%). Knowledge varied by working experience, institution, and prior EOLC training, and attitudes varied by ethnicity. Knowledge and attitude demonstrated a weak but significant positive correlation (ρ=0.274, p=.002). Content-specific gaps were evident in advance care planning (ACP) timing and dyspnea management with morphine, despite generally accurate recognition of quality domains and comfort-focused care priorities.

Comparison with prior literature

The knowledge profile aligns with findings from Jordan, where nurses exhibited moderate EOLC knowledge (Subih et al., 2021). Higher knowledge levels reported in Malaysia and Nigeria (Ingwu et al., 2016; Subramanian & Chinna, 2024) underscore contextual differences such as curricula, training access, and local protocols, which may explain variability. Consistent with international evidence, our results reinforce the need for in-service education as a frequently cited professional requirement for improving EOLC competence.

Item-level patterns were mixed. Only one-fifth correctly identified a core definition of EOLC, and just 4.8% selected appropriate ACP timing, consistent with reports that nurses often lack clarity about ACP (Punia et al., 2024). Conversely, most respondents identified opioids for end-of-life pain control and prioritised comfort measures near death, paralleling observations from India that clinicians recognise broad team roles in EOLC (Bharathy et al., 2017).

Attitudes in our cohort mirror favourable or fair attitudes reported in Nepal and Ethiopia (Gurung & Timalsina, 2018; Parajuli et al., 2022), yet exceed mean FATCOD scores reported in Turkey and contrast with unfavourable attitudes found in Egypt (Ali et al., 2022; Hamdan et al., 2023). Such heterogeneity likely reflects differences in education, specialist training, and work environments across settings.

Determinants and system-level interpretation

Associations between knowledge and experience/training observed here concur with Ethiopian and Jordanian studies linking tenure and EOLC education to stronger knowledge (Subih et al., 2021). The institutional effect (Bir vs. National Trauma Center) suggests that organisational resources and routines influence knowledge acquisition, echoing syntheses identifying environment, resources, and training as modifiable supports for EOLC (Xia & Kongsuwan, 2020). The ethnicity-attitude association may reflect how cultural frameworks shape beliefs and behaviours around dying and care. Notably, other studies report mixed or null associations between attitudes and demographics (Ali et al., 2022; Bharathy et al., 2018; Hamdan et al., 2023), highlighting context-specific drivers.

The weak knowledge–attitude correlation indicates that favourable attitudes alone may not translate into complete competence without structured education, practice supports, and standardised processes. This supports a shift from solely individual-focused training to system-level integration.

Implications for anaesthesia-led integration

Given leadership of anaesthesiologists in ICU sedation/analgesia, ventilator support, and care transitions, the findings point to pragmatic anaesthesia-led levers: (i) institute unit protocols embedding ACP triggers (e.g., at ICU admission or early de-escalation), (ii) deliver simulation-based communication training integrated with FATCOD-informed reflection, (iii) standardise symptom-control bundles (opioids for dyspnea/pain, secretion management, non-pharmacologic comfort), and (iv) operationalise inter-professional huddles and documentation checklists. Such measures address identified gaps (ACP timing, dyspnea management) while converting positive attitudes into reliable practice.

Family-centred dispositions observed here (e.g., support for bereavement and involvement in care) align with evidence that family education and support reduce distress and enhance care quality (Hudson et al., 2018) and can be scaffolded through anaesthesia-led pathways (e.g., flexible visitation guidance, structured family meetings).

Strengths and limitations

Strengths include coverage of multiple ICU/HDU types across two tertiary institutions and a sample design that ensured unit-level representation. Limitations include the cross-sectional design, potential self-report bias in attitudes (Peters et al., 2013), convenience sampling, and restriction to two hospitals, which may limit generalizability. The study did not directly observe behaviours; thus, translating attitudes to practice should be inferred cautiously.

CONCLUSION

This cross-sectional study of nurses in intensive and high-dependency care units indicates that integration of end-of-life care (EOLC) within critical care is constrained by system-level factors. Nurse knowledge generally fell at a moderate level, while attitudes toward EOLC were predominantly positive. Knowledge varied meaningfully by professional experience, institutional context, and prior training exposure, and attitudes differed across cultural groupings. A weak positive association between knowledge and attitude suggests that goodwill and receptivity alone are insufficient to ensure competent, consistent practice without structured supports.

Interpreting nurse knowledge and attitudes as indicators of organisational readiness, the findings highlight actionable levers for anaesthesia-led integration of EOLC. Standardised unit protocols, particularly early triggers for advance care planning, symptom-control bundles, and simulation-based, inter-professional communication training, can translate positive attitudes into reliable bedside care. Prioritising units with limited training opportunities and tailoring implementation to the institutional context may accelerate system-level adoption and embed EOLC within routine ICU workflows.

CONFLICT OF INTEREST

The authors declared no conflict of interest.

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INTENDED VERSUS ENACTED CURRICULUM AND PRACTICE IN SECONDARY SCHOOLS' SCIENCE CLASSROOMS: EVIDENCE FROM SELECTED DISTRICTS OF NEPAL

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ABSTRACT

Introduction: *Nepal's secondary science curriculum emphasises learner-centred, inquiry-oriented pedagogy, yet classroom practice is widely perceived as textbook-bound. This study examined the alignment between intended and enacted curricula and practice in secondary science classrooms.*

Methods: *We used a mixed-methods, descriptive–exploratory design. Disproportionate stratified random sampling and pragmatic snowballing identified secondary science teachers across selected localities in both districts. Data sources included a structured questionnaire, classroom and meeting observations, semi-structured interviews, focus group discussions (FGDs), key informant interviews (KIIs), and case studies; tools were pre-tested and refined before full administration. The final sample comprised 149 teachers.*

Results: *Classroom practice was predominantly transmission-oriented. Most teachers read from the textbook during instruction (77.18%; 115/149), indicating strong reliance on text over concept-driven teaching. Lesson planning was rarely child-centred: no teachers reported fully child-centred plans, and the modal category was "least child-centred" (39.59%). Lecture-dominated methodological choices (39.59%), whereas heuristic/inquiry approaches were uncommon (4.02%). Practical work was infrequent: over two-thirds reported never using a practical approach (71.14%). Science-popularising activities were scarce, with reports from only a small minority of schools. Training profiles diverged by sector: most government teachers reported formal training, while few private-school teachers did so; however, textbook-bound practice persisted across both sectors. Qualitative accounts suggested private-school classrooms were somewhat more student-centred under stronger administrative and parental accountability, whereas government schools were more conventional.*

Conclusions: *Findings reveal a pronounced intended–enacted curriculum gap in secondary science. Despite policy aspirations and substantial training (particularly in the government sector), classroom instruction remains dominated by textbook reading, lecture, and minimally child-centred planning, with limited practical work and few co-curricular science activities. Addressing this misalignment will require aligning assessment with inquiry; strengthening school-*

level accountability and instructional coaching; expanding low-cost practicals, mobile lab kits, and science-club programming; and embedding meaningful ICT use within teacher professional learning. These steps, implemented within the study area contexts, can make learner-centred, inquiry-oriented science both expectable and doable in everyday practice.

Keywords: *curriculum; practice; curriculum-practice gap; secondary schools; science education; textbook-bound teaching; learner-centred education; inquiry-based pedagogy; mixed-methods; Nepal*

INTRODUCTION

Nepal is currently undergoing significant social, political, economic, and cultural transformations (Gautam, 2022; Adhikari & Lawoti, 2024; Yadav, 2016). These continual developments require enhancements in instructional design and delivery methods. Advancements in technology have significantly transformed the process of learning and teaching, offering novel learning possibilities and access to educational resources that go beyond the conventional resources available in Nepal (Shirazi & Hajli, 2021). Without a comprehension of the intricate learning requirements of socio-culturally and linguistically varied learners in present-day Nepal, debates about the educational path society should take are unlikely to hold significance or be mutually understandable. Is the current educational system capable of effectively addressing the increasing requirements of pupils from varied socio-cultural and linguistic backgrounds? Due to the conventional instructor-centred approach, students may struggle to comprehend the intended message of the teacher. Educators can comprehend how information is seen and processed in diverse ways by identifying learners' learning styles (Chang, 2010). An essential factor in motivating learners to engage in the learning process is comprehending and utilising their learning style preferences, which can have a significant impact on a learner's performance, either favourably or adversely (Rad et al., 2024).

A notable increase in the use of instructional technology in schooling in recent years has been confirmed by Lee and Winzenried (2009). Computer technology provides a wide range of alternatives for teachers and students to improve the teaching and learning process by utilising a variety of functions, from basic to advanced. In order to implement educational changes, the Nepalese government is currently looking into the use of information and communication technology (ICT). As Hanna noted in 2003 (Hanna, 2003), this involves looking into the possibility of cooperation between the public, business, and donor sectors to efficiently apply and reap the rewards of ICT capabilities. These problems include the development and application of a particular technology or approach without theoretical underpinnings, learning packages made without a strong instructional design foundation, or both (Lee and Winzenried, 2009; Ross et al., 2010). Moreover, Stones warns that these resources will become antiquated and pointless if teachers are not properly taught in learning about and utilising modern technology. Nobody is confident enough or has the requisite experience to use them.

Just adding science content can present significant challenges for every student, possibly hindering their ability to understand the teacher's intended message. In an English-medium classroom, a language barrier could make it more difficult for the pupils to understand what the teacher is teaching (Thomas and Watters, 2015). It is feasible to use constructivist-oriented teaching strategies to help students understand science in the English language (Mohammed,

2023). Therefore, the purpose of this study was to investigate how constructivist instruction affects students' ability to understand scientific concepts in science classes taught in English. Using a constructivist teaching methodology could provide educators with the tools they need to help students understand science.

Because science education is strongly linked to achieving modern economic growth, advanced technology, and a contemporary political and social perspective (McDonald, 2016), emerging nations like Nepal have a tremendous difficulty in maintaining the social relevance of science education. Attaining these goals is currently hampered by the unfavourable economic conditions, the challenging educational goals, and the social and cultural aspects of education. There is a dearth of scientific educators with training in science education in Nepalese secondary schools. There is a disconnect between science education as it is theoretically taught and as it is actually taught, which frequently depends only on textbooks, due to a lack of pedagogical knowledge and skills. In the subject of science education, textbooks have primarily been used to teach science, which has caused a gap between the lives of teachers and pupils. This is partially because there aren't enough suitable facilities and laboratory supplies available. The purpose of the study is to look at the difficulties faced by Nepalese schools and how these difficulties are addressed when teaching science. We will also suggest ways to incorporate science instruction with the varied backgrounds of teachers and students in the classroom.

Science learning necessitates a balanced integration of cognitive, emotional, and psychomotor processes. Students' bodies, minds, and emotions are stimulated through these activities, which develop critical thinking abilities (Gardner, 2008). A teacher-centred approach falls short in promoting discussion, debate, and cognitive engagement in the classroom. In the classroom, students are arranged in neat, well-prepared rows. If science is taught using a dogmatic approach, students will become bored and will be forced to memorise methods.

In Nepal, theoretical concepts are emphasised primarily in science education. Real-world scenarios are rarely incorporated into the educational environment. Many science schools, according to Shrestha (2009), neglect to teach basic concepts and fail to relate them to real-world issues (Shrestha, 2011). Even though practical, hands-on exercises are the most efficient approach to properly grasp and assimilate scientific knowledge, classroom lectures typically do not cover the practical aspects of science. This indicates that a large number of Nepalese secondary educational institutions use the logical approach to scientific instruction.

Because science has the potential to be a technical topic and lead to careers in engineering and medicine, it is required as a mandatory subject in Nepal. Parents and students alike strongly support science. Informal observations indicate that most scientific professors use a theoretical approach while instructing students in science. As a result, students believe science to be a difficult subject that is out of reach for those from lower socioeconomic backgrounds, and they find it difficult to acquire the necessary degree of scientific knowledge and proficiency. Improving pupils'

science performance was the main goal of the study. Understanding and analysing the differences between the theoretical framework and the way science is currently taught in schools is crucial. Furthermore, it's critical to create a comparison between the theoretical and practical techniques. When teaching students about science in the classroom, teachers face a number of difficulties. The purpose of this study is to compare how pedagogy is applied in science classrooms as it is envisioned by educational science pedagogy and in science teacher preparation.

Teachers in government schools are usually credentialed and licensed educators. This suggests that the educators have received specific training in teaching approaches or have gained knowledge of the theoretical underpinnings of scientific education. Moreover, the statistics have shown that those schools' scientific instruction has relied unduly on textbooks. Numerous problems can have come from the government, the teacher, the students, or the school. A thorough investigation aimed exclusively at revealing the actual status of science education in Nepal is necessary in order to look at these phenomena.

The purpose of this study is to examine the theoretical and practical approaches used in science instruction in Nepali secondary schools. The main aim of the study is to investigate the teaching techniques, practical approaches, and theory of science education in selected districts of Nepal. Specifically, the study sights: (1) to investigate science education practices in the area of investigation; (2) to analyze the application of theoretical and practical approaches to science education; (3) to investigate the disparity between science educations based on textbooks and the theory of science education; (4) to identify how educators feel about the implementation of a practical approach to scientific education; and (5) to explore the challenges to science education and strategies to improve scientific teaching. This study offers a contextualised account of curriculum intentions and textbook-bound practices, reviews and comments on policies and their efficacy, and makes recommendations for change that can inform teacher education, school leadership, and system actors.

METHODS

Research Design and Approach

This study adopted a descriptive–cum–exploratory research design to investigate the current state of science teaching in secondary schools and the situational issues science teachers encounter. The exploratory component was used to examine practices, theoretical frameworks, and policy directives; the descriptive component documented prevailing instructional strategies and classroom realities. Mixed methods were employed, integrating quantitative and qualitative approaches to provide a comprehensive understanding of curriculum-based versus textbook-bound teaching.

Philosophical stance (Ontology, Epistemology, Axiology)

The research proceeded from explicit ontological, epistemological, and axiological stances. Ontologically, the study acknowledged debates between scientific realism and constructivism and recognised their implications for whether schooling favours inquiry-driven curricula or textbook-

centred practice. Epistemologically, the study contrasted constructivist views—learning as active knowledge construction through inquiry and application—with positivist views emphasising the accumulation of objective facts. Axiologically, the study foregrounded the values embedded in science education (e.g., curiosity, critical thinking, and ethical responsibility) and considered how these values shape curriculum choices, teaching methods, and assessment, especially within resource-constrained Nepali classrooms. These foundations guided instrument design, data collection, and interpretation.

Study Area and Population

The study was conducted in Kathmandu and Nuwakot districts. In Kathmandu, focal localities included Kalanki, Soalteemode, Bafal, Kalimati, and Kirtipur; in Nuwakot, Bidur Sub Metropolitan City, Deurali, and Khadga Bhanjyang were covered. The secondary-school study population comprised instructors, students, principals, and other relevant authorities. A total of 149 teachers (55 female and 114 male) employed in various institutions were engaged as key informants to document practices, challenges, and developments that science educators presently encounter.

Sampling Strategy

A disproportionate stratified random sampling (DSRS) design was used to ensure representation across key strata, with particular attention to gender representation, given the relatively smaller number of female instructors. DSRS was chosen to assign appropriate weight to strata where proportional allocation might otherwise underrepresent important groups. In addition, snowball sampling was used pragmatically to locate relevant respondents and facilitate data collection in schools where access and identification were challenging.

Data Sources

Primary data were collected through face-to-face interviews, focus group discussions (FGDs), classroom and meeting observations, key informant interviews (KIIs), and case studies. Secondary data were gathered from published books, journals, articles, reports, unpublished theses, newspapers, and other documentary sources to contextualise and triangulate primary findings.

Data Collection Instruments and Procedures

A structured questionnaire (48 sections) captured quantitative data on individual characteristics and classroom practices. Semi-structured and open-ended interview guides supported in-depth interviews, KIIs with science teachers, principals, and school officials, and FGDs organised into three relatively homogeneous groups. Direct observation was undertaken in multiple classrooms and teachers' meetings to document enacted practices. Case studies were compiled to portray real-life experiences and constraints faced by teachers. Fieldwork included recruiting and training field assistants, compiling name/address lists of selected respondents, managing logistics, coordinating with relevant offices for permissions, and attending to ethical protocols of confidentiality and privacy.

Pre-test and Instrument Validation

The tools were pre-tested with eight respondents from varied categories. Revisions were made before final administration to enhance clarity and alignment with research objectives. Validity

(the extent to which tools measure what they intend to measure) and reliability (precision/ consistency of measurement) were addressed through design rigour, rapport-building to elicit authentic responses, and iterative refinement.

Data Processing and Management

Data management bridged collection and analysis through editing, classification, coding, and tabulation. Quantitative responses were coded and entered for tabulation; qualitative materials (field notes and audio-recorded interviews) were transcribed and expanded into detailed textual records. Qualitative data were then sorted, thematised, graphed (as needed), and organised using codes and sub-codes.

Data Analysis

Quantitative analysis used frequency distributions, simple tabulation, cross-tabulation, and visual displays (graphs and pie charts) as appropriate. Qualitative analysis followed analytic induction and a thematic approach, using the semi-structured and open-ended materials to derive categories linked to curriculum intentions and enacted practices. Mock tables were prepared in the interim to aid verification and clarification before the final presentation.

Rigour and Trustworthiness

To uphold rigour, the study addressed issues of representation, legitimisation, and practice. Multiple techniques and layered presentation were used to incorporate diverse perspectives; interpretations preserved contextual authenticity and textual faithfulness; and theoretical procedures were applied to assure accuracy and consistency. Follow-up interviews with informants (on five distinct occasions) and re-transcription further strengthened confirmability.

Ethical Considerations

Ethical protocols adhered to principles of respect, confidentiality, and informed consent. The researcher built rapport, explained study objectives, and proceeded after obtaining verbal consent. In line with ethical theory, the study observed non-maleficence, beneficence, self-determination/ autonomy, and equity, ensuring participants were treated fairly and not harmed, and that the research produced discernible benefits.

RESULTS

This section presents the socio-demographic characteristics of the respondents. It also analyses the teacher's role in the classroom, the importance of the teacher's education, theories of learning science and many more. It also attempts to analyse and explain exemplary practices of teaching science. This chapter also links with science education and society, with a rigorous study of the relationship between various aspects that affect teaching science.

Socio-Demographic Information about the Respondents

Socio-demographic information provides a broad understanding of the age, sex, gender, and other characteristics of the respondents. To gain a comprehensive understanding of the population's

features, this discussion will focus on some socio-demographic factors. The features include age, qualifications, the type of schools where they teach, training, and other relevant factors. The respondents are a subset of individuals selected from the larger population. The samples were picked from the entire population of teachers who teach in government and institutional schools in the study area. This sample reflects half of the total number of instructors, which is 149. It consists of 114 male teachers and 55 female teachers. These samples aid in determining the distinctive features of a representative group. The data is displayed in the form of diverse tables and charts.

Age and Gender of the Respondents

Age is a crucial determinant that affects the overall perception among parents and students. There is informal hearsay that students tend to prefer mature teachers. Some schools have implemented a minimum age requirement for teacher vacancies. The table provides information regarding the age and gender of the respondents. We have surveyed 149 instructors who specialise in teaching science in both public and private schools located in the study area.

Table no. 1: Distribution of age and gender of the respondents

SN	Age Class	Female	Male	Total
1	18–25	3 (9.67%)	5 (4.23%)	8 (5.36%)
2	25–33	7 (22.58%)	51 (43.22%)	58 (38.92%)
3	33–41	8 (25.80%)	39 (33.05%)	47 (31.54%)
4	41–49	8 (25.80%)	14 (11.86%)	22 (14.76%)
5	49–59	5 (16.15%)	9 (7.62%)	14 (9.39%)
Total		**31 (100%)**	**118 (100%)**	**149 (100%)**

The sample consisted of a total of 149 respondents. Within the study population, the age group of 25-33 had the largest number of responders, with 58 individuals, accounting for 38.92% of the total. The data indicates that the age group with the highest representation is between 25 and 33 years old, with a greater number of male participants than female participants. The data indicate that the majority of respondents were in the age range of 25-33, with a higher proportion of males engaged in teaching occupations. This indicates a prevailing trend where a greater number of males across all age groups are engaged in the field of science education.

Demonstrating content knowledge in teaching science

Content knowledge is seen as a crucial attribute in all forms of teaching, including science teaching. Research has shown that teachers with a strong grasp of the subject matter are perceived as skilled educators, and their pupils find their classes enjoyable. It has been noted that teachers with a strong understanding of scientific topics can teach in the classroom without relying on the textbook. The provided table displays data regarding teachers' behaviour during teaching, namely, whether they read from a book in front of the pupils or teach fluently without referring to the book.

Table no. 2: Use of books during teaching in class

SN	Respondents	Yes	No	Total
1	All the age groups	115	34	149
	Total	**115 (77.18%)**	**34 (22.81%)**	**149 (100%)**

Table 2 indicates that a majority of the scientific teachers who participated in science teaching were observed to be reading from a book while teaching in the classroom. Out of a total of 149 teachers, 115 of them, or 77.18%, use books during their teaching sessions. The remaining 34 teachers do not use books during their scientific classes. It is imperative to enhance the competency level of teachers.

Use of a child-centred lesson plan

This indicates that science education in Nepalese schools mostly focuses on imparting information. The table below presents an analysis of whether the teacher's lesson plan functions as a facilitator or not.

Table no. 3: Use of child-centred lesson plan

SN	Type of lesson plans	The total number of teachers using the specific lesson plan
1	Not child-centred	33
2	Least child-centred	59 (39.59%)
3	Moderately child-centred	56
4	Highly child-centred	0
5	Fully child-centred	0 (0%)
	Total	**149 (100%)**

The data in Table 3 indicates that the number of teachers who utilise the least child-centred lesson plan is the largest, with a total of 56, representing 39.59% of the total. There are no teachers who employ a fully child-centred lesson plan, making the number of such teachers the lowest possible value. This indicates that the utilisation of child-centred lesson plans is highly inadequate. It is necessary to alter the current condition.

Use of different teaching techniques

Here is the table which shows the use of different methods of teaching science.

Table no. 4: Use of different teaching techniques

SN	Teaching methods	Number of teachers using a specific method
1	Lecture method	59 (39.59%)
2	Discussion method	55
3	Role-play methods	21
4	Demonstration method	8
5	Heuristic approach	6 (4.02%)
	Total	**149 (100%)**

Table 4 shows that 59 (39.59%) respondents chose the lecture technique as their primary teaching approach. Of the total respondents, 55 use the conversation approach. Twenty-one of them employed the role-playing method, while eight used the demonstration method. The least value of data in Table 5 is 6, indicating that teachers are utilising the heuristic method.

Practices of teaching science in different schools

During the observation, it was discovered that scientific instruction at private schools is somewhat student-centred. These schools have been connected to larger training facilities and educational institutions in Kathmandu. However, the teaching methodology at government schools is more conventional. One of the instructors at a private school in the Nuwakot district stated, "We receive less training than teachers at government schools and even fewer resources, but we are working to make our classes more student-centred because, should we fail to meet the needs of our students, they will complain to the administration and parents, potentially costing us our jobs." Conversely, a government school teacher retorted, saying, "We have sufficient training and a degree in education… However, the outcomes are subpar." Based on the aforementioned claims, it may be said that although private school instructors receive lower compensation and less training, they nevertheless produce better work… Thus, it can be concluded that private and public schools in Nepal employ different teaching methodologies.

Use of a practical teaching approach in science class

Science education involves more than just imparting knowledge from teachers to students. It is important to provide pupils with an understanding of scientific phenomena and to instil in them a scientific mindset. Information about teaching science using a practical approach is provided in the table below.

Table no. 5: Use of a practical approach in science class

SN	The frequency of using practical teaching	Government school	Private school	Total
1	Never	86	20	106 (71.14%)
2	Seldom	9	6	15
3	Frequent	18	10	28
	Total	**113**	**36**	**149 (100%)**

Table No. 5 above demonstrates that just 28 respondents use the practical teaching technique with students frequently, while the largest percentage of respondents, 106 (71.14%), don't use it in the classroom. From the standpoint of public and private educational institutions, the majority of government school teachers do not employ a practical teaching methodology. As a result, the preceding chart demonstrates that most responders who frequently employ a practical approach also attend government schools. This is a result of the lack of laboratories in many private institutions for hands-on learning. The entire table demonstrates the need to educate educators on the practical nature of science education.

Analysis of the availability of trained teachers

One of the most important requirements for every career is training. Skilled educators are regarded as excellent educators and exhibit high levels of professionalism. The government of Nepal gives government instructors a lot of training. Teachers employed in the private sector receive less training from commercial organisations. NCED offers government school teachers in Nepal training.

Table no. 6: Teacher training status in the study area

SN	Respondents	Yes	No	Total
1	Government school teachers	96	0	96 (64.42%)
2	Private school teachers	4 (2.68%)	49 (32.88%)	53 (35.57%)
	Total	**149**	**0**	**149 (100%)**

Table 6 indicates that there are a total of 96 trained teachers in government schools, which accounts for 64.42% of the total. Only four out of all the remaining instructors in private schools, which account for 2.68%, have received training. The remaining 49, which accounts for 35.57% of the total, have not received training. This demonstrates that teachers employed by the government undergo extensive training and possess a higher level of competence. However, it is still necessary for teachers in private schools to receive training.

Science popularising activities in schools

Science clubs harness the energies of students and effectively employ their abilities and talents, so fulfilling their intrinsic goals and contributing to the holistic development of their personality… The Science Club facilitates the development of skills such as experimentation, critical thinking, and problem solving by bridging the divide between in-class and out-of-school learning.

Table no. 7: Status of science popularising activities in the school

SN	Respondents	Yes	No	Total
1	Government school teachers	2	94	96 (64.42%)
2	Private school teachers	10	43	53 (35.57%)
	Total	**12**	**137**	**149 (100%)**

The data from Table 7 indicates a scarcity of science popularisation initiatives in both government and private institutions. Only two respondents who teach in public schools reported engaging in scientific popularisation initiatives at their school… In summary, it is necessary to carry out science popularisation initiatives in schools.

Students' assessment and results

Evaluating students is a critical aspect of the teaching process. Through observation, it has been determined that all teachers utilise both formative and summative evaluation methods as part of their regular teaching practices. Private schools administer formative tests more frequently than government institutions. The following are several sorts of assessments employed in scientific education.

Formative evaluation

Formative evaluation is used to monitor the educational progress of pupils during the teaching period. The main objective is to provide continuous feedback to both the teacher and student regarding their learning progress and areas for growth during the instructional process. Offering

feedback to students helps to strengthen effective learning and identify specific learning deficiencies that need to be addressed. Offering feedback to a teacher provides essential information that may be utilised to modify classes and assess the necessity for both group and individual remedial work. Formative evaluation allows a teacher to consistently evaluate the advancement of students… The core principle of formative evaluation centres on the production of knowledge that can be used to modify or improve educational approaches.

Synthesis with respect to intended vs. enacted curriculum

During the investigation, the researcher found that the scientific teachers were providing instruction instead of enabling science lessons… Evidence indicates that science education in Nepalese schools mostly focuses on imparting information.

The above quantitative and qualitative findings across Kathmandu and Nuwakot show dominant textbook use during teaching, low utilisation of fully child-centred lesson plans, reliance on lecture and discussion over practical and heuristic approaches, infrequent practical work, uneven teacher training between government and private schools, and scarce science-popularising activities in both sectors. (Details summarised directly from Tables 2–8 and accompanying field narratives.)

DISCUSSION

The enacted classroom practices in secondary science remain predominantly textbook-bound and teacher-centred, diverging from curriculum intentions that emphasise facilitation and activity-based learning. Quantitatively, most teachers read from the textbook during instruction (115 of 149; 77.18%), underscoring a performative reliance on text rather than fluent, concept-driven teaching. Lesson planning was seldom child-centred: none of the teachers reported using fully child-centred plans, and the modal category was "least child-centred" (39.59%). Methodologically, lecture dominated (39.59%), whereas inquiry-oriented "heuristic" teaching was rare (4.02%), signalling limited uptake of constructivist pedagogies in day-to-day practice. Practical work was infrequent: over seven in ten teachers reported they never used a practical approach (71.14%), with government schools especially unlikely to do so. Beyond the classroom, science-popularising activities were scarce; only 12 of 149 respondents reported any such initiatives in their schools.

Qualitative accounts revealed a consistent pattern: private-school classrooms were described as "somewhat student-centred" under stronger administrative oversight and parental accountability, whereas government-school classrooms were more conventional, with weak monitoring and few consequences for poor outcomes. Together, the findings substantiate a marked intended–enacted curriculum gap in secondary science.

Comparison with prior literature

These results mirror the portrait in the literature of Nepal's "silent classroom" norms and teacher authority that constrains dialogue and critique (Thapaliya, 2022). Prior work documents expectations that students passively absorb content while teachers demonstrate solutions on the board—conditions antithetical to inquiry and debate (Shrestha, 2011). The present evidence of pervasive lecture, minimal child-centred planning, and rare practical work is therefore consistent with longstanding critiques of dogmatic, textbook-driven pedagogies in Nepal that foster rote learning rather than conceptual understanding.

At the same time, the curriculum's constructivist orientation positions the teacher as a facilitator who scaffolds collaborative, contextualised problem-solving (Ozkan, 2022; Shrestha, 2011). The low adoption of heuristic and practical approaches observed here sits in tension with these theoretical commitments, reinforcing the gap between policy prescriptions and classroom realities (Cuban, 1984; Khanal, 2018; O'Toole Jr, 2004; Shah, 2021; Spillane et al., 2002). Moreover, earlier accounts attribute textbook dependency partly to resource constraints (Joshi & Dangal, 2020; Singh, 2024)—insufficient laboratories and facilities—again resonating with the limited practical work and thin ecosystem of science-popularising activities we documented.

Determinants and system-level interpretation

Two sets of determinants emerge. First, accountability and monitoring: private schools appear to enforce closer supervision and face immediate parental feedback, which teachers describe as pushing them toward more student-centred practice despite fewer formal trainings. Government schools report extensive training opportunities but minimal accountability and weaker oversight—conditions that teachers themselves connect to "subpar outcomes." Second, resources and enabling conditions: the scarcity of laboratories and peripheral supports (science clubs, exhibitions, Olympiads) likely depresses hands-on activity and inquiry practices, especially in government schools.

Against a constructivist policy backdrop, the system signals mixed incentives: curricular rhetoric promotes facilitation and practical work, yet institutional arrangements (assessment regimes, supervision, workloads) and school-level resource profiles nudge teachers back to coverage-driven lecturing and textbook reading.

Implications

For curriculum and assessment: Bridging the intended–enacted gap will require aligning assessment with inquiry and application, reducing incentives for coverage-only lectures and verbatim note-taking. The curriculum's social-constructivist aims should be operationalised through tasks that require investigation, collaboration, and contextualised problem-solving (Kivunja, 2014).

For teacher development: In-service support should pivot from generic "training received" to coaching on planning and facilitating child-centred lessons, with observation–feedback cycles tied to concrete artefacts (lesson plans, lab tasks, portfolios). The private-school pattern suggests that coaching, supervision and classroom-embedded accountability, not just workshop dosage, shape practice (Houston, 2015).

For school resourcing and the learning ecosystem: Expanding low-cost practical, mobile lab kits, and a structured programme of science-popularising activities (clubs, exhibitions, Olympiads) can scaffold inquiry when full laboratories are not immediately feasible. The literature details how such activities cultivate experimentation, critical thinking, and problem-solving and complement classroom learning (Hebebci & Usta, 2022; Tan et al, 2023).

For technology and supports: ICT integration, alongside teacher preparation to use it meaningfully, can diversify modalities and lower the activation energy for demonstrations and simulations in constrained settings—provided professional learning addresses design and pedagogy, not just hardware (Jung, 2005; Jimoyiannis, 2010; Lewis et al., Bell et al., 2013; 2014; Mpuangnan, 2024).

Strengths and limitations

A key strength is the mixed-methods, multi-site design across two districts, which triangulated survey evidence with qualitative accounts of classroom realities and school-level incentives, thereby deepening interpretation of the curriculum–practice divide. The study's limitations—documentation and access challenges, administrative bottlenecks, COVID-19 disruptions, and time constraints—may have constrained observation opportunities and the breadth of participating schools, potentially biasing estimates of practical work and extracurricular provision downward or upward, depending on which schools remained accessible.

Future research directions

Future work should (i) experimentally test packages that combine accountability (e.g., instructional coaching and observation rubrics) with enabling resources (mobile labs, micro-practical) to estimate causal impacts on enacted pedagogy and learning; (ii) trace within-teacher change over time as assessment tasks are redesigned to reward inquiry; (iii) study cost-effective models for science clubs and exhibitions that can be sustained in rural and low-resource schools; and (iv) compare how private and government schools respond to identical facilitation-focused PD when external monitoring is held constant, to isolate the role of incentives versus capacity.

CONCLUSION

This study examined the comparative status of curriculum-based and textbook-bound science teaching in secondary schools across the study area, documenting practices, constraints, and school-level differences to assess how far the intended curriculum is enacted in classrooms. Across sites, the enacted pedagogy was largely transmission-oriented. Teachers commonly read from the textbook during instruction, and classroom observations indicated that many were only converting textbook knowledge for the pupils, whereas practical classroom activities are crucial for developing cognitive capabilities through psychomotor engagement. Consistent with this, there were no fully child-centred lesson plans reported, and the prevailing tendency was toward the least child-centred approach.

Differences by school type were evident. Private schools were described as predominantly student-centred, linked to closer connections with training centres and stronger accountability, even when teachers received less training and lower compensation; government schools tended to be more conventional. Private-school teachers, concerned about job insecurity, reported employing child-centred learning approaches to the best of their knowledge, whereas in public schools, students' socio-economic origins, weak oversight, and a sense of job permanence impeded outcomes, together indicating a disparity in teaching methods between sectors. Training profiles reflected systemic asymmetries. The classroom in both sectors remained textbook-driven, while government-employed teachers reported extensive training, and only a few private-school teachers were trained. These patterns emphasise that teachers in private schools still require training and, more broadly, that instructors need to be made aware that the curriculum, not the textbook, should be used when teaching. Both curriculum and textbooks are crucial to science instruction: the curriculum is an all-encompassing educational method or plan, while the textbook is a resource created to support its goals; yet the study revealed universal textbook use, with limited teachers demonstrating familiarity with the curriculum.

The wider learning ecosystem for inquiry was thin. Schools seldom hosted science-popularising activities such as clubs, exhibitions, and Olympiads, indicating that conducting science-popularising activities in schools is necessary; assessment practices combined formative and summative approaches, with private schools more frequently administering formative tests. Taken together, the findings confirm a pronounced misalignment between curriculum intentions and enacted classroom practice. Over the past decades, there has been a significant impetus to improve attainment through reforms in curricula, instruction, and teacher preparation; this requires a shift in teachers' roles, from traditional knowledge transformers to facilitators, planners, mentors, and collaborative professionals, supported by enabling conditions of work and resources. Enhancing professionalism and aligning stakeholder expectations across public and private schools remains central to translating the curriculum into learner-centred, inquiry-oriented practice.

CONFLICT OF INTEREST

The authors declared no conflict of interest.

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CHALLENGES IN IMPLEMENTING ENGLISH AS A MEDIUM OF INSTRUCTION IN NON-ENGLISH BASIC LEVEL SCHOOLS

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ABSTRACT

This study aimed to explore the challenges in implementing English as a medium of instruction at the basic level schools of Ilam district. The research method selected for the study was qualitative in nature. To meet the objectives of the study, 10 English and non-English teachers and 10 students of basic level from two community schools located in Suryodaya Municipality, Ilam were selected as participants. The participants were selected using a purposive sampling strategy. The researcher collected data by using an open-ended interview. The collected data were first transcribed and then analysed based on the thematic data analysis method. After analysis and interpretation of data, it was found that teachers are facing numerous challenges in implementing English as a Medium of Instruction (EMI) in community schools in Suryodaya Municipality, Ilam. The challenges include limited English language proficiency among teachers, insufficient training and resources, diverse classroom dynamics, assessment difficulties, and inadequate support from educational stakeholders. Additionally, the limited use of English outside the classroom, parental involvement issues, and a lack of adequate support from responsible sectors further complicate EMI implementation. Students are also facing challenges, including fear of making mistakes, insufficient English language exposure outside of class, challenges in transitioning from Nepali to English instruction, and difficulties in understanding academic content delivered in English.

Keywords: *English as a medium of instruction, Perceptions, Practices, Challenges*

INTRODUCTION

The phrase "medium of instruction" indicates the language in which education, teaching, and communication take place within a formal educational setting, such as a school or a university. It is the language that teachers use to deliver lessons, and students engage in different learning activities. The language of instruction significantly impacts how students access, engage with and effectively absorb educational content (Karki, 2018). As the English language is extensively used in all domains of life and works as a lingua franca, it is widely accepted as the language of instruction not just in countries where it serves as a second language, but also in those where it is considered a foreign language.

English is a well-known global language and is also used internationally. In education, it is important both as a subject to learn and as the language used for teaching English as a medium of instruction (Aryal, 2022). In this context, Dearden (2014) describes EMI as utilising English to instruct academic subjects in regions where the predominant language spoken by most people is not English. (p.2). It applies to facilitate the learners with content knowledge, as well as to become familiar with the language. Currently, English is rapidly transitioning from being taught as a foreign language (EFL) to being used as the primary language of teaching (Dearden, 2014).

Although EMI has spread globally, the move is perceived differently by educational stakeholders and criticised from various angles. “Some experts are in favour of EMI, while others tend to view that the implementation of EMI may cause difficulties in the teaching-learning process. The experts support the application of EMI in enhancing students' learning outcomes. Meanwhile, the experts who do not support the application of EMI are those who can see the potential advantages of EMI in students in improving student achievement” (Zainura, 2019, p.1).

Ojha (2013) cites, "they argue that the use of a foreign language to teach basic concepts of science, numeracy and literacy in the early grades is detrimental to the cognitive development of children in the long run".

In contrast to the rapid spread and benefits of this phenomenon, EMI has not implied immediate success, especially in implementation. Nevertheless, there is an ongoing and extensive discussion regarding the effectiveness of EMI in higher education, particularly within contexts where English is taught as a foreign language (Ojha, 2018).

English has been introduced as a medium of instruction for a decade in Nepal. It was applied for the first time in Nepal's first formal school, Darbar High School, in 1854 (Ojha, 2016). Yet, it has not been able to achieve its goals in the Nepalese community schools. English language competency in community school children is not up to the mark and causes a hindrance in their acquisition of further opportunities and prosperity.

For some years, many community schools have faced student dropout problems, and the number of students has decreased in community schools. Their parents also seek to provide their children with an education conducted in English. The modernisation process and EMI with opening up possibilities for students to demand English everywhere. It is thought to be a way to exchange ideas and create relations between countries (Bhusal, 2017). Therefore, some community schools have chosen to teach subjects such as Science, Mathematics and other subjects in English. However, teachers are encountering various difficulties when trying to implement English as a Medium of Instruction (EMI) in their classrooms.

Statement of the Problem

According to the Constitution of Nepal (2072), every Nepali community residing in Nepal shall have the right to get primary education in its mother tongue, and the state shall provide education to such communities in their mother tongue. Nepali is the official language of Nepal, and it is widely used as a medium of instruction, especially in government schools. However, in areas with distinct language and ethnic communities, local languages may be used as a medium of instruction at the primary level, as encouraged by the constitution.

The Constitution of Nepal (2072) presents that basic level education can be provided in three languages: Nepali, the mother tongue, and English. Many schools are implementing EMI for quality education. Teaching students in English has become a current trend. They are shifting to EMI from Nepali medium in school education. Despite the implication of EMI for decades, its effectiveness is not satisfactory in the context of Nepal, especially in community schools.

In Suryodaya Municipality of Ilam district, which is located in the eastern part of Nepal, many community schools have shifted from Nepali medium to EMI. As we all know, every parent desires the best quality education for their children, which leads them to choose private schools instead of community schools, despite the high fees. This trend has resulted in many students dropping out of government community schools. To attract parents and retain students, many community schools in Suryodaya Municipality of Ilam district, which is located in the eastern part of Nepal, also began shifting from Nepali to EMI. Initially, the change increased student enrolment. However, these schools struggled to provide the same quality of education as private institutions. Consequently, students began leaving these schools, leading to a decline in enrolment. Teachers and students faced numerous challenges that they were unable to manage effectively. Consequently, many schools closed, and others are at risk of closing due to the decreasing number of students. Not only that, in-service teachers who are teaching in community schools often prefer to send their children to private schools, reflecting a profound lack of confidence in the quality of English education they are providing (Gaire, 2017). This situation represents a critical issue in my study.

The shift to EMI from Nepali medium in community schools has faced many difficulties during the implementation. Although many research studies regarding the challenge and remedial measures have been accomplished by various governmental and non-governmental organisations from time to time in different places, we did not find anyone doing research in this field in Ilam district, as well as the EMI aims and goals have not been successfully achieved yet in Ilam district. Through this research study, we attempted to explore the challenges of the implementation of EMI at basic-level schools of the Ilam district.

Objectives of the Study

The objectives of the study were as follows:

i) To explore the challenges in implementing EMI at the basic level in Suryodaya Municipality, Ilam district.

ii) To provide some pedagogical implications based on the findings.

Research Questions

The research questions raised in the study were:

i) What are the perceptions of teachers on implementing EMI in schools?

ii) What are the challenges that are faced by English, non-English teachers and students while implementing EMI in basic-level schools?

iii) How are challenges being treated while implementing EMI in school?

REVIEW OF RELATED LITERATURE

A literature review is a survey of various scholarly sources on a specific topic. It helps us to understand the existing knowledge, theories, methods, and gaps related to research. The literature related to the study has been dealt with a review of thematic literature, theoretical literature and a review of empirical literature.

Review of Thematic Literature

Several surveys of books, scholarly articles, and other sources relevant to the implementation of English as a medium of instruction were reviewed in this section under the various themes. We have reviewed the previous research under the following themes related to the topics discussed, based on the primary and secondary sources that we have studied and understood so far.

Medium of Instruction

"Medium of instruction" relates to the language or mode of communication used in an educational setting to teach students various subjects and concepts. It is the language through which teachers convey information, and students engage in learning activities and assessments. The selection of the language of instruction can have a significant impact on students' understanding and retention of knowledge, as well as their overall educational experience. In simple terms, the medium of instruction describes every language that a teacher and learners use to run entire educational activities. It is the language that a teacher and students use to interact in classroom activities. It can be either their L1 or L2, or even a foreign language.

Nepal has a complex and evolving situation regarding the language used for teaching within its educational system. The choice of the medium of instruction in Nepal has been a matter of discussion, and it has gone through several changes over the years. It is crucial to recognise that educational policies may evolve, making it possible that there have been developments since that time. Here's a general overview of the medium of instruction in Nepal up to 2021.

Nepali, also known as Nepali Bhasa, is the official language of Nepal and has traditionally served as the primary medium of teaching in schools, with most textbooks and educational materials available in Nepali. However, this approach faces challenges due to the country's linguistic diversity, with numerous ethnic and linguistic groups each having their own languages. To address this, the government introduced a Multilingual Education Policy, encouraging the use of children's mother tongues as the medium of instruction in the early years of schooling to enhance comprehension and knowledge retention, before gradually transitioning to Nepali. English is also taught as a subject and is deemed important for higher education and job opportunities, with some private schools using English as the medium of instruction, particularly at higher levels. Regional variations exist, especially in urban areas and private schools, where instruction may be offered in English or other languages depending on specific programs and student demographics. Despite these policies, the implementation of an effective medium of instruction faces challenges due to the diverse linguistic landscape and varying proficiency levels in Nepali and English, particularly in remote and marginalised areas where access to quality education remains limited.

English as a Medium of Instruction

Using English as a medium of instruction (EMI) is a practice where the English language is used as the primary language for teaching and learning various subjects in an educational institution. EMI is often employed in countries where English is not the native language but is considered a global lingua franca. (EMI) refers to the use of the English language to teach academic subjects (other than English itself) in the countries or jurisdictions where the first language of the majority of the population is not English" (Macro et al., 2018, p. 37)."An educational system where content is taught through English in contexts where English is not used as the primary, first, or official language" (Rose & McKinley, 2018, p. 111).

"The use of the English language to teach academic subjects in countries or jurisdictions where the first language (L1) of the majority of the population is not English" (Dearden, 2014, p. 4). Many countries around the world have implemented EMI in their education system to produce competent citizens for the global market, where competency in the English language is given priority in all sectors. According to Joshi (2020), English as an international lingua franca is rapidly growing its high demand almost everywhere in the world. It is playing a leading role in international trade, communication, politics, economy, education, entertainment, and culture due to the growing trend of globalisation throughout the world. In addition, Dearden (2014) asserts that EMI is increasingly being used in universities, secondary schools, and even primary schools. There are several reasons why institutions and countries choose to adopt English as a medium of instruction. One reason is simply Global Communication. English is widely recognised as a global language for communication in various fields, including business, science, technology, and academia. Using EMI can prepare students to engage in international discourse and access a wealth of English-language resources. Another reason is internationalisation. Many universities and institutions aim to attract international students and faculty members. Offering programs in English can make an institution more accessible and appealing to a global audience. A more similar reason is access to Global Knowledge. A significant amount of academic literature, research papers, and educational materials is available in English. EMI can facilitate students' access to these resources and the global body of knowledge. Furthermore, employability is another reason for implementing EMI. English proficiency is frequently considered a valuable asset in the job market, particularly in multinational companies and industries with a global presence. EMI can help students develop strong English language skills, enhancing their employability. Likewise, EMI is in many renowned universities and institutions worldwide. For students aspiring to study abroad, EMI can prepare them for higher education in English-speaking countries.

Dearden (2014) asserts that EMI is increasingly being used in universities, secondary schools, and even primary schools. He further reveals in his report that the EMI phenomenon is in a state of flux. It is being supported, rejected, changed, and sometimes even undone in different countries. Thus, the effectiveness of EMI is debatable, especially in multilingual countries like Nepal, where English is used as a foreign language.

English Medium Instruction in Nepal

Although Nepal is a geographically and socio-culturally diverse country, it began to teach English language and literature around the middle of the twentieth century. Durbar School, the first formal school established in 1854 AD, introduced English as a mandatory subject for the first time

in Nepal. An English language school was opened only for the children from the ruling Rana family, which played an important role in establishing English language in Nepal. Tri-Chandra College was the first higher education institution of the country, which was established in 1918 AD. It followed and used the English language as the medium of instruction, which continued until the Nepal National Education Planning Commission (1956) under the Panchayat system recommended using the Nepali language as the medium of instruction in education throughout the country. However, many prestigious schools kept using English as the language of instruction to preserve their status and attract more students. After Nepal's democratic restoration in 1990, numerous institutional schools opened in district headquarters and other cities, using English widely as a medium of instruction. This made English accessible to those who could afford the educational expenses. Apart from these issues, the interim Constitution of Nepal (2015 AD) has provided the right to use one's mother tongue (L1) as the medium of instruction in community schools of their region. However, at present, these schools apply their mother tongue or their local language as the medium of instruction at the micro level, while EMI is mostly implemented at higher grades to compete with the private institutions in terms of student enrollment, higher success rate in standardised tests and the existence of the schools.

Language Policy in Nepalese Education

The 2021 national census lists 129 languages spoken as mother tongues in Nepal, with most belonging to the Indo-Aryan and Sino-Tibetan language families. Given this linguistic diversity, it is crucial to recognise the challenges and opportunities it presents for the education system, particularly in developing effective policies that support multilingual education and promote cultural heritage. Education has been an ongoing topic of discussion and change in this linguistically diverse country, where numerous languages are spoken by various ethnic groups. The Constitution of Nepal (2015) states that languages spoken in Nepal are recognised as national languages and mentions in Article 31: Right Relating to Education, clause 5: "Every Nepalese community residing in Nepal shall have the right to get education. It is the mother tongue and, for that purpose, to open and operate schools and educational institutes, by law." In Nepal, there is considerable pressure from the public and linguistic communities to adopt mother tongue instruction as the medium of education in primary schools. As highlighted by UNESCO (2016), "utilising local languages in education is crucial for enhancing learning outcomes and supporting linguistic diversity, particularly in a multilingual context." However, some argue that Nepali and English should be used as the medium of instruction at all educational levels due to global and societal demands.

Review of Related Theories

Connecting with the existing theories will help to develop a framework for my research study. Regarding the importance of theoretical review, Osanloo and Grant (2016) suggest that the theoretical framework is the foundation from which all knowledge is constructed (metaphorically and literally) for a research study. It serves as the structure and support for the rationale for the study, the problem statement, the purpose, the significance, and the research questions. Since the main intention behind implementing EMI is to improve one's English language competency rather than to develop their academic knowledge. We have chosen to adopt Vygotsky's Social Interaction Theory based on constructivism to overview of this study. Constructivism is based on

the idea that individuals or learners construct new understandings and knowledge through their experiences and social interaction, integrating with their prior knowledge.

Vygotsky's Social Interaction Theory, based on social constructivism, suggest that cognitive development is fundamentally shaped by social interactions and the cultural environment. This theory emphasises that learning occurs through the guidance and support of more knowledgeable others (MKO), such as teachers or peers, which enables learners to reach the Zone of Proximal Development (ZPD). The ZPD represents the difference between what a learner can accomplish independently and what they can achieve with guidance. Vygotsky defines it as "the distance between the actual development level as determined by independent problem-solving under adult guidance, or in collaboration with more capable peers" (Vygotsky, 1978, p. 86). In the context of English as a Medium of Instruction (EMI), this theory is particularly relevant because it underscores the importance of structured social interactions and scaffolding in developing students' language proficiency alongside academic content knowledge.

In EMI settings, where students are expected to learn academic subjects in English—a language that may not be their first—Vygotsky's concept of the ZPD provides a valuable framework for understanding how language development can be effectively facilitated. The role of the teacher as an MKO is crucial in these environments. Teachers must provide structured support and scaffolding to help students progress beyond their current level of language proficiency. This involves not only delivering content knowledge but also modelling language use, providing clear explanations, and creating opportunities for active student participation. Through such guided interactions, students can develop a deeper understanding of both the language and the subject matter.

To make EMI effective, certain key elements are necessary. Firstly, teachers need to be proficient in English and skilled in teaching methods that combine language learning with subject content. This approach helps students understand complex topics while developing their academic language skills. A supportive learning environment is also important. This can be created using resources like English-language books, videos, and digital tools that expose students to English in meaningful ways (Dahal, 2018). Encouraging group work, discussions, and projects allows students to practice English in real-life situations and learn from each other.

Scaffolding, or providing support based on students' language levels, is another crucial aspect. Teachers should give more help to students who need it and reduce support as students become more confident. This ensures that all students can engage with the material and build the language skills needed for different subjects. Additionally, language learning should be integrated within academic subjects, not taught separately, so that students can develop the specific vocabulary and skills required for academic success.

Despite its potential, implementing EMI in line with Vygotsky's principles is not without challenges. Teacher proficiency in English is a significant factor, as educators must be able to deliver content effectively while supporting language development. Moreover, access to quality instructional materials in English can be limited, particularly in resource-constrained settings, making it difficult to provide students with the necessary exposure and practice. Additionally, learning in a second language can be intimidating for students, leading to anxiety and a lack of confidence. It is therefore essential to create an inclusive and supportive classroom environment

where students feel comfortable using English, even when making mistakes.

Overall, Vygotsky's Social Interaction Theory offers a robust theoretical foundation for understanding how EMI can enhance students' English language proficiency through structured social interactions and scaffolding. However, the success of EMI hinges on aligning pedagogical practices with constructivist principles and providing adequate support for both teachers and students. Effective EMI requires a combination of proficient teachers, quality instructional materials, and a conducive learning environment that encourages active language use and interaction. By meeting these conditions, EMI can create a dynamic and supportive context for language learning, helping students develop the English skills needed for academic achievement and broader global engagement.

METHODS AND PROCEDURES OF THE STUDY

Methodology indicates the overall strategy utilised to conduct research. It refers to a set of research methods and techniques selected by the researcher. Here, we applied the following methods for data collection and analysis:

Research Design

Research design is a plan the researcher follows to answer research questions in a valid, objective, accurate, and economical manner. This study utilised a qualitative approach, which aims to explore and understand the meanings that individuals or groups assign to social or human issues. The research process involves developing questions and procedures as the study progresses, gathering data in the participants' natural settings, analysing the data by identifying specific details and then finding general patterns, and interpreting the data's meaning (Creswell, 2009).

In the field of research study, various research designs are available. For my study, we chose the narrative inquiry method, which is widely used in a qualitative approach.

Sources of Data Collection

This study gathered data from 10 basic-level English and non-English teachers and 10 students from two community schools in Suryodaya Municipality, Ilam district. The researcher collected data from secondary sources such as books, journals, and theses. Additionally, data were collected from websites and the internet to ensure the study's relevance and timeliness.

Data Collection Tools and Techniques

A set of open-ended questions and interview guidelines were the major tools for data collection. An open-ended question allows the respondent to give a detailed answer, addressing different aspects of the question.

An interview is a spoken conversation between two people aimed at gathering important information for research. McNamara (1999) mentions that interviews are especially helpful for understanding the background of a participant's experiences.

In this study, both open-ended questions and interview guidelines were employed as primary tools to compare responses. The open-ended questions provided rich data, and interviews offered deeper insights. This allowed for cross-checking responses to ensure consistency and validity in the findings.

We conducted detailed interviews with each participant in the study, engaging in thorough conversations with 10 teachers, both English and non-English, as well as 10 students, on the topic, 'Challenges in Implementing English as a Medium of Instruction" in the basic level of Suryodaya Municipality, Ilam district. We had taken note in my diary to keep the participants' responses and engage in telephone conversations with some of them, too.

Data Collection Procedure

First of all, we prepared a set of open-ended questions related to the objectives. Then, we sampled schools and individual subject teachers. We built a good rapport with the schools and administrations and informed them about my research studies and the purpose of my study. We studied books, articles, and thesis studies to get ideas to do research in a meaningful way and to develop the guidelines for interviews. Then, we shared open-ended questions with the teachers, students at the basic level and took responses from individual teachers and students from two different schools. We asked English and non-English teachers and students to help me by providing authentic information. We took an interview as well. Before conducting the interviews with participants, we had a set of open-ended questions for the interview and took their responses in a diary. In my research study, we spent around two months collecting data.

Ethical Considerations

Ethical consideration is a crucial aspect of research. It refers to the values that the researcher has to follow during the research process. Ethical guidelines for research are principles that protect morality and guide researchers when they conduct research; they keep researchers accountable, thus ensuring proper use of funds and avoidance of research misconduct (Mazumdar, 2022).

This research study was conducted according to academic principles and values. The authors whose works were consulted during the study were honestly acknowledged. Before taking an interview, the researcher took informed consent and built rapport with participants, stating the purpose of the study. In the same way, the researcher ensured that their names, addresses, and responses were kept confidential. To conceal the identity of the participant, the data was presented, giving the pseudonyms. The data would not be used for any other purposes except completing this academic purpose.

Results: Analysis and Interpretation

This chapter deals with the analysis and interpretation of the raw data collected from two community schools located in Suryodaya Municipality of Ilam district. 10 teachers were purposively selected and interviewed individually to express their views and experiences through open-ended questions. However, respecting the ethics of maintaining secrecy, the teachers are coded in numbers, and they are provided with pseudo names during the analysis process. As we have adopted the thematic data analysis method to explore the challenges faced by teachers while implementing EMI in the basic level of Suryodaya Municipality, Ilam district, the findings are categorised under the following themes. The following presentation shows the discussions based on the data derived from teachers' interviews.

Teachers' Perceptions towards EMI

Teachers' perceptions of English as a Medium of Instruction (EMI) often vary depending on their experiences, backgrounds, and the contexts in which they teach. Teachers' perceptions play a critical role in the successful implementation of English as a Medium of Instruction (EMI). Teachers' perceptions of EMI significantly impact its success by influencing their motivation, teaching practices, and support for students. Positive perceptions lead to effective implementation, while negative views may hinder progress. The data collected through interviews shows that the non-language teachers were familiar with the concept of EMI. They viewed English as a lingua franca necessary for various reasons, including better job opportunities, access to global knowledge, employment, standardisation, and higher education. Regarding the reasons for implementing EMI in their respective schools, one of the teachers (T1) responded, "To fulfil the demands of modern times, compete with others, facilitate higher studies, and increase the chances for better jobs." Likewise, the next teacher (T2) expressed, "To develop communication skills in English and meet the challenges of global integration."

These responses indicate that the primary motivations for adopting EMI are not just focused on language acquisition but also on positioning students to thrive in a globalised world. Teachers recognise that English plays a crucial role in modern competitiveness, career prospects, and communication skills development.

Although the teachers agree that the English language should be prioritised, it was observed that the effectiveness of instruction among non-language teachers remains a challenge. Many of these teachers struggle with delivering their subjects effectively through English, which suggests that while EMI is seen as necessary for broader global integration, the lack of proficiency in English among non-language teachers may hinder its successful implementation.

EMI Practices in Reality

Although teachers accept EMI as a positive step towards enhancing English language competency, none of them applies only English as the sole medium of instruction. Even English language teachers use both Nepali and English in their classroom teaching. In the context of implementing English as a Medium of Instruction (EMI), teachers adopt varied approaches to language use in their classrooms. Some utilise English exclusively, while others blend it with Nepali or even incorporate students' mother tongues to deliver content effectively. One of the teachers (T1) stated, "As a teacher, I use English and sometimes Nepali to ensure students understand the content clearly." Similarly, another teacher (T2) mentioned, "I use both English and Nepali,' indicating a balanced approach to language use in the classroom."

Other teachers also demonstrate diverse strategies. Teacher (T4) noted, "I use English," indicating a preference for English-only instruction. In contrast, Teacher (T6) explained, "I use Nepali and the mother tongue of students," showcasing an approach that incorporates multiple languages to cater to students' linguistic needs. Furthermore, Teacher (T10) remarked, "I use English and sometimes Nepali," illustrating a flexible approach that adapts to the specific needs of students and the curriculum.

These varied approaches underscore the adaptability of teachers in implementing EMI, highlighting how language use is tailored to meet educational objectives and support effective

learning. In reality, despite positive attitudes towards EMI (English as a Medium of Instruction) for enhancing English language skills, teachers in the basic-level community schools of Suryodaya Municipality, Ilam, commonly use a mix of English and Nepali in their classroom instruction. This hybrid approach reflects both practical challenges and the need to accommodate students' linguistic needs and comprehension levels.

While some teachers predominantly use either English or Nepali, many opt for a bilingual approach to effectively deliver content and support student learning. This diversity in language use highlights the ongoing adaptation and contextualization of EMI practices within the Nepalese educational setting. The reality of classroom practices reveals that while EMI is perceived as important for global integration and future opportunities, its implementation requires flexibility to ensure that students fully understand the content.

Challenges in Implementing EMI

English is in high demand globally, including in Nepal, where it has become essential across various sectors. Consequently, the government has introduced a policy to adopt English as a Medium of Instruction (EMI) in community schools at the basic level. However, effectively implementing EMI in Nepal's community schools presents significant challenges. My study focuses on schools in the Suryodaya Municipality of Ilam district, where we have identified various issues faced by teachers, students, administrators, and other stakeholders. Through interviews with teachers and students, we have tried to find out the challenges they faced while implementing EMI and possible solutions to overcome those challenges.

In numerous countries, the educational infrastructure is inadequate for providing quality English as a Medium of Instruction (EMI). Implementing EMI necessitates significant changes and improvements in the physical infrastructure of community schools. Many teachers employ a bilingual approach, translating from Nepali to English and explaining the content to students, while assessing them in English (Dearden, 2014). Similarly, Simpson (2017) contends that introducing EMI into community education systems already burdened by severe resource constraints, untrained and unqualified teachers, large class sizes, and limited instructional time presents considerable challenges.

We conducted interviews with basic-level teachers in two different community schools of Suryodaya Municipality of Ilam district. Based on this research, we identified several significant challenges in implementing EMI at the basic level in community schools. These challenges include limited English proficiency, insufficient teacher training, inadequate learning resources, the lack of English-language teachers' guides, assessment and evaluation challenges, limited use of English outside the classroom, classroom diversity, insufficient support from relevant authorities, and issues related to parental involvement.

Limited English Proficiency

Proficiency in the English language for teaching refers to the level of skill and fluency a teacher has in using English as the primary language of instruction and communication in the classroom. It involves mastery of vocabulary, grammar, pronunciation, and the ability to effectively convey concepts, provide instructions, and facilitate discussions in a manner appropriate for educational settings. Cultural sensitivity and understanding of contextual uses of English are also important.

Assessment of language proficiency typically includes evaluations of listening, speaking, reading, and writing abilities. Continuous professional development is crucial for teachers to maintain and enhance their English language proficiency, ensuring they can effectively support students in acquiring and using English language skills. However, in the context of Nepal schools that are implementing English as a medium of instruction, many teachers have limited proficiency in English, making it challenging to deliver content effectively and communicate with students in the language.

During data collection, we asked teachers about the challenges that they are facing while implementing EMI. One of the major challenges in implementing English as a Medium of Instruction (EMI) is the varying levels of English proficiency among teachers. In many cases, the lack of fluency hampers effective teaching, leading to issues in communication and the delivery of content. As T1 explained:

> *A lack of English fluency among many teachers in our school makes it difficult for them to effectively teach their subjects. This deficiency leads to misunderstandings, miscommunication, and a generally lower quality of education. Additionally, due to their limited English skills, teachers often resort to translating content from Nepali to English, which diminishes the effectiveness of the instruction. This bilingual approach can confuse students and impede their understanding and retention of the material.*

Similarly, T2 and T10 also shared a similar view that they prefer translating content from English to Nepali due to limited language skills, which reduces instructional effectiveness and can confuse students, impeding their understanding and retention of the material. In the same vein, T3 also expressed, "I struggle with English, and it makes teaching very stressful. I've accepted that my lessons won't be as good as they could be if my English were better."

Likewise, T4 and T5 said that they know that their English isn't perfect, but they practice every day while teaching in the classroom. It is a challenge, but they can see their improvement over time. T6 said, "Teaching in English is challenging. I sometimes switch back to our native language to make sure students understand. I use a lot of pictures and other materials to help." In the same vein, T7 and T8 said that teaching in English is challenging, but they view it as an opportunity for their personal growth. They ask their students to be patient and learn together with them.

The data reveal that many teachers face significant challenges with English proficiency, which negatively impacts the implementation of English as a Medium of Instruction (EMI). Teachers like T1, T2, and T10 emphasise how their limited fluency leads to misunderstandings, miscommunication, and a decrease in instructional quality. Teachers like T1, T2, and T10 mention that their limited fluency causes confusion and weakens students' understanding of the lessons. They often translate from Nepali to English, which further complicates learning. T3 also feels stressed because of their poor English and believes their lessons aren't as effective as they could be. However, some teachers are making efforts to improve. For example, T4 and T5 practice their English every day, seeing small improvements over time. T6 uses pictures and sometimes switches to the native language to help students understand better. Teachers like T7 and T8 view the challenge as a chance to grow and encourage their students to learn alongside them. Overall, the teachers' varying levels of English fluency impact how well students understand and learn in EMI classrooms.

Therefore, the implementation of English as a Medium of Instruction (EMI) in Suryodaya Municipality presents both opportunities and challenges. Limited English proficiency among teachers significantly affects instructional quality and student comprehension. However, with dedicated professional development and supportive resources, these challenges can be addressed. By equipping teachers with the necessary skills and fostering a collaborative learning environment, EMI can effectively enhance educational outcomes and better prepare students for future opportunities.

Insufficient Teacher Training

Teacher training involves the education and professional development of teachers to equip them with the knowledge, skills, and competencies required to effectively teach students. It encompasses a wide range of activities and programs designed to prepare teachers for their roles in the classroom and to support their ongoing development throughout their careers. However, teachers lack proper training in teaching subjects in the English language, including methodologies and pedagogical approaches required for effective EMI.

During data collection, several teachers highlighted the challenges they face with EMI training. Many reported that, although they receive initial training and workshops, they do not benefit from ongoing support or professional development. They also lack specialised language training, resources, and technology, while geographical barriers further exacerbate these challenges. As T1 explained, "We receive training, workshops, and seminars, but lack continuous professional development and follow-up support. There is also insufficient specialised language training, infrastructure, resources, and technology training, compounded by geographical barriers." Similarly, T2 noted, "We receive training, but it is not sufficient to improve our English, and there is no continuity in the training. Longer and ongoing training would be more effective for implementing EMI successfully."

T3 and T4 echoed these sentiments, expressing that the training sessions are too infrequent and spaced too far apart, emphasising the need for a more continuous and consistent training schedule to enhance their skills. Likewise, T5 pointed out the lack of training on effectively integrating technology into English language teaching, stating, "There isn't enough training on effectively integrating technology to support English language teaching. Utilising digital tools could significantly improve our instructional approaches." In addition, T8 and T9 agreed, noting that the training focuses too much on theory and lacks practical tools for classroom use. They stressed that in the current age of rapid technological progress, teachers need training on embracing digital tools and methods to enhance their teaching.

Likewise, T10 emphasised the absence of follow-up after training sessions, reeking, "After training sessions, there is no follow-up to monitor our implementation of what we've learned. Regular follow-ups would ensure effective application of the training." Overall, the teachers consistently underscored the need for ongoing training, practical resources, and technological integration to improve their effectiveness in implementing EMI.

The data highlights several significant challenges in teacher training for implementing EMI, including the lack of continuous professional development and inconsistent training programs. Teachers report insufficient specialised training, particularly in language skills and technology integration, and express frustration with infrequent training opportunities. Additionally, the

absence of follow-up support after sessions and geographical barriers further hinder progress. Overall, there is a clear need for ongoing, consistent training that provides both theoretical knowledge and practical tools, along with regular follow-up, to improve how teachers implement English as a Medium of Instruction in basic-level community schools.

Inadequate Learning Resources

Learning materials are essential in the teaching and learning process, providing teachers and students with the resources needed to enhance understanding and mastery of subjects. Learning materials can be of different types, such as textbooks, audio-visual aids, multimedia resources like videos and animations, and online learning materials.

During data collection, we asked teachers about the challenges and found that another significant challenge in implementing English as a Medium of Instruction (EMI) is the lack of appropriate resources and infrastructure in schools. Many teachers struggle to deliver effective lessons due to the absence of essential materials and technology. As T1 pointed out:

> *Here is a shortage of suitable teaching materials and resources for using English as the medium of instruction. My school does not have the necessary infrastructure, such as a language lab or technology, to support effective EMI. The teacher teaches through a textbook, and the class has only the daily use materials, like a whiteboard, which are not sufficient for effective teaching and learning.*

T2 shared a similar view, noting, "Our school lacks digital resources and technology, which makes it challenging to effectively engage basic-level students in EMI due to the absence of English-language audiovisual materials like educational videos." Likewise, T4 highlighted the challenge of conducting practical lessons, saying, "Our school faces a challenge in English Medium of Instruction (EMI) due to a lack of laboratory equipment and materials for conducting science experiments. This deficiency restricts students' practical learning experiences in science subjects."

The data reveal critical shortcomings in the resources and infrastructure necessary for the effective implementation of English as a Medium of Instruction (EMI) in schools. Teachers consistently highlight the absence of essential tools like language labs, digital resources, and technology. This lack of infrastructure forces them to rely on basic materials such as textbooks and whiteboards, which are inadequate for fostering an engaging and interactive learning environment. Additionally, the absence of audio-visual aids, which are particularly important for supporting students in understanding English, limits the depth and clarity of content delivery.

Furthermore, the lack of laboratory equipment significantly hampers practical learning in subjects like science, where hands-on experimentation is crucial for student understanding. Without these resources, students miss vital opportunities to apply theoretical knowledge, especially in subjects that require practical engagement. As a result, these limitations not only hinder effective teaching but also restrict students' ability to grasp and apply key concepts.

The lack of teaching materials, technology, and practical tools severely undermines the school's ability to successfully implement EMI, suggesting an urgent need for infrastructure improvements to enhance both teaching quality and student learning outcomes.

Lack of a Teacher's Guide in English

A teacher's guide is a vital resource designed to help educators teach effectively and accurately. An effective English as a Medium of Instruction (EMI) program often relies on well-defined teaching resources and guidelines. However, the absence of a teacher's guide can significantly hinder lesson planning and instructional consistency. T1 highlighted this concern, noting:

> *Teachers are left to teach using their methods and strategies. With a teacher's guide, we would have a clear roadmap to follow, ensuring our teaching remains on track, but there is no teacher's guide in our school, which makes it tough to plan EMI lessons.*

The above-mentioned data reveal that the teachers are facing enormous challenges posed by the lack of a teacher's guide for implementing English as a Medium of Instruction (EMI). Teachers reported being left to rely on their own methods and strategies, which often led to inconsistencies in lesson planning and execution. They emphasised the need for a structured guide that would provide a clear roadmap for teaching, ensuring lessons remain aligned with curriculum objectives. Without such a resource, many teachers struggle to plan and organise effective EMI lessons, especially those who are not fully confident in their English proficiency. This lack of standardised guidance also increases the workload for teachers, as they must create their own materials, often resulting in uneven lesson quality and difficulties in maintaining consistent instruction across different subjects.

In the same vein, T2 said:

> *We do not have a teacher's guide here, and the absence of such a resource significantly hampers my confidence in teaching in English. Without a guide to refer to, I often feel uncertain about whether I am following the right approach or covering the content adequately. It becomes difficult to structure lessons effectively, and I frequently worry that I might be missing important elements that would help students understand the material better. The lack of a guide leaves me without a reference point for best practices, making it harder to feel fully prepared for class. This uncertainty affects my ability to teach with confidence and engage students effectively in an English-medium environment.*

This data highlights the significant challenges teachers face while implementing English as a Medium of Instruction (EMI) due to the absence of a teacher's guide. Teachers like T2 experience considerable uncertainty in their teaching practices without a structured guide to follow. This lack of guidance complicates lesson planning, content coverage, and effective delivery, leaving teachers unsure if they are meeting educational standards. The absence of a reference point for best practices not only affects their confidence but also hinders their ability to engage students and deliver effective instruction in English. This underscores the need for comprehensive instructional resources to support successful EMI implementation. There is a need for attention to this issue.

Assessment and Evaluation Challenges

Assessment refers to the process of measuring students' knowledge, skills, and understanding through various methods, such as tests, quizzes, and assignments. Evaluation involves analysing these assessment results to judge the effectiveness of teaching methods and the extent of student learning, ultimately guiding instructional decisions and improvements. Challenges in assessment and evaluation are prevalent in schools implementing EMI, especially when both students and teachers have limited English proficiency.

T1 noted these specific issues:

> *After the implementation of EMI in our school, we are facing numerous challenges in assessment and evaluation, particularly due to limited English proficiency. Many students have limited proficiency in English, making it difficult for them to fully understand exam questions and express their knowledge accurately, and some of the Teachers themselves do not have a strong command of English, affecting their ability to design and evaluate assessments effectively.*

From the above-mentioned data, it can be stated that implementing EMI at the basic level of community school reveals significant challenges in assessment, with many students struggling to comprehend exam questions and express their knowledge due to limited English proficiency. Furthermore, some teachers' inadequate English skills hinder their ability to design and evaluate assessments effectively, compounding the difficulties faced in the educational approach.

Likewise, T2 also shared the same view, he said: "I notice that students grasp the concepts when we explain them in their language, but they have difficulty expressing what they know in English during tests."

This indicates that students understand concepts well when they are taught in their native language, but they face difficulties expressing their knowledge in English during tests, suggesting a gap between comprehension and language proficiency. In the same vein, T4 said:

> *Here is a lack of materials, inappropriate assessment tools, insufficient training, and professional development opportunities for teachers on how to effectively assess and evaluate students in an EMI context are the assessment and evaluation challenges that we are facing while implementing EMI in our school.*

This data shows that implementing English as a Medium of Instruction (EMI) at the basic level of school brings considerable assessment and evaluation challenges due to a lack of materials, inappropriate assessment tools, and insufficient teacher training and professional development on effective EMI assessment methods. Overcoming these obstacles necessitates a comprehensive strategy that includes creating customised assessment tools, providing extensive teacher training, and allocating necessary resources. By addressing these issues, schools can enhance the effectiveness of EMI, ensuring fair and accurate assessment of student learning. Fair and effective assessments in English may be a challenge, especially if there is a mismatch between the curriculum and the student's language proficiency.

Diversity in the Class

Vu and Burns (2014) mention that the different learning styles and personalities of students make teaching difficult. In Nepal, which has many cultures, religions, and languages, classrooms are very diverse with students having various backgrounds and learning abilities. Teaching methods are designed for all students in the classroom and deliver the same standards of education. However, this may not be achievable with a largely diverse classroom. The teacher may find it difficult to plan a lesson because of different cultures, religions, languages, and learning abilities (p.16).

We asked the question, 'The classroom is full of diversity; it creates problems while implementing EMI. Do you agree with this statement? T8 responded:

> *Students come from various family backgrounds and have different learning styles and abilities. However, there are not many problems with students' diversity in the maths subject. Mathematical terms are easily understood by the students, and English is a foreign language to all the students.*

We asked the same question to T9 'What do you think about EMI in this diverse classroom?' T9 replied:

> *Implementing EMI in a diverse classroom is challenging because of various factors. Language barriers make it difficult for students from different linguistic backgrounds to understand lessons. Cultural and religious concepts are harder to grasp when taught in English. Socioeconomic disparities affect access to resources, widening the educational gap. Ensuring educational equity is tough, as students need different levels of support. Teachers require specialised training to handle diversity and EMI effectively. Classroom dynamics are complex due to varied learning styles and needs.*

Therefore, the above data highlights the hurdles of implementing EMI in diverse classrooms. Teachers acknowledge difficulties stemming from language barriers, cultural and religious differences, socioeconomic disparities, and varied learning needs among students. While some see fewer issues in subjects like mathematics, where technical terms are universally understood, the overall consensus emphasises the complexity of adapting EMI to meet the diverse educational needs present in Nepalese classrooms.

Limited Use of English Outside the Classroom

Using English outside the classroom is essential for the successful implementation of EMI because it reinforces language skills, builds confidence, promotes fluency, enhances cultural competence, and supports academic achievement. This real-world practice helps students develop the proficiency in English necessary for effective communication and academic success in diverse educational settings. However, students do not get the opportunity for English practice outside academic settings, which is one of the challenges in implementing EMI.

Teachers have expressed concerns about the limited use of English outside the classroom as a significant challenge in implementing English as a Medium of Instruction (EMI). For example, T3 mentioned, "Students don't get to use English much at home, where Nepali is the main language. This lack of practice affects their fluency and confidence in English." T5 noted, "English isn't used much in students' daily lives or community activities, so they struggle to apply what they learn in class to real-life situations." T7 added, "Without more English usage outside of school, students' language skills improve more slowly and their overall proficiency is lower."

The above-mentioned data shows that limited use of English outside the classroom is a major challenge for implementing English as a Medium of Instruction (EMI). Teachers highlight that because students mainly use Nepali at home and in their community, they have fewer chances to practice English. This lack of practice affects their fluency, confidence, and ability to use English in real-life situations. As a result, their language skills develop more slowly, and their overall proficiency is lower. This highlights the need for more English usage in students' daily lives to improve the effectiveness of EMI.

Parents Related Challenges

The home is the first school for a child, with parents serving as their initial teachers. Children spend 18 hours a day with their parents, making proper parental guidance crucial for implementing EMI at the basic level in community schools. However, not all students have educated parents who can provide this support. Uneducated parents are unable to guide their children at home, complicating EMI implementation in community schools. Many parents of these students live below the poverty line, preoccupied with earning a living and unable to focus on their children's education. Additionally, they often lack knowledge of English and cannot afford the necessary books and stationery. This poverty can lead to feelings of inferiority among students, causing a loss of confidence and distracting them from their studies.

Parental involvement plays a crucial role in the success of educational programs, including English as a Medium of Instruction (EMI). However, challenges in parental engagement can significantly impact the effectiveness of EMI. T4 and T7 provided insights into these challenges at their school:

> *In our school, we have two kinds of parents: those who are educated and take an active role in their child's education, and those who are uneducated and poor. The second group does not know much about their child's academic performance, can't afford proper books, stationery, or uniforms, and does not understand how important their involvement is in improving their child's education.*

T7 noted, “In community schools, only a few parents recognise the importance of education and are available to help their children with their learning. The school hours from 10 am to 4 pm are not enough to offer a complete quality education without proper parental support".

From the above-mentioned response, it can be concluded that there is a big gap in parental involvement in their school. Uneducated and poor parents cannot effectively support their children's education, and regular school hours are not enough without their help. This shows that support from different sectors is essential for successfully implementing EMI.

Trust Issue Regarding EMI in Community School

During data collection, we asked some of the teachers about the quality of education in the Community School. They compared the quality of English education with the private school, and not only that they send their children to private schools.

The trust issue regarding the quality of education in community schools, where even in-service teachers prefer to send their children to private schools, poses a significant challenge to implementing EMI. This perception undermines the confidence of parents and the community in the effectiveness of EMI in public schools. Additionally, teachers who lack trust in the system may be less motivated, impacting their enthusiasm and commitment to EMI methodologies. This trust deficit affects student confidence and motivation, as well as community support and involvement, which are crucial for the success of EMI programs. To address this, it is essential to improve the quality and accountability of education in community schools, establish transparent communication channels, involve stakeholders in decision-making, showcase successes, provide ongoing teacher training and support, and implement pilot programs to demonstrate the effectiveness of EMI. Rebuilding trust is vital to ensure that all students can benefit from quality English-medium education in public schools.

Lack of Adequate Support from Responsible Sectors

Effective implementation of English as a Medium of Instruction (EMI) requires substantial support from various sectors, including government, school administration, educational stakeholders, and local and international agencies. During data collection, it was evident that support from these responsible bodies is crucial but often lacking in clarity and effectiveness. Teacher 8 pointed out, "Responsible bodies provide some support for implementing EMI, but there is a lack of a clear concept on how to utilise available resources. The management is not satisfactory." Similarly, T2 highlighted:

> *In our school, the responsible bodies lack a clear idea of how to effectively manage EMI implementation. They pressure teachers to implement EMI successfully without providing the necessary resources. As a result, teachers often gather, create, and use locally available materials themselves and turn to Google for content when they are uncertain.*

The statements from T8 and T2 illustrate the challenges faced in implementing English as a Medium of Instruction (EMI) due to insufficient and unclear support from responsible bodies. T8 notes that while some support is provided, there is a significant lack of clarity on how to effectively utilise the available resources, resulting in unsatisfactory management of the EMI program. Similarly, T2 points out that the responsible bodies not only lack a clear strategy for managing EMI but also place undue pressure on teachers to achieve success without supplying the necessary resources. Consequently, teachers are forced to rely on their own initiative, creating and using locally available materials and seeking additional content online. This highlights a disconnect between the expectations set for EMI and the practical support provided, leading to challenges in delivering effective instruction and managing the implementation process.

In summary, the study conducted in Suryodaya Municipality, Ilam district, explores the challenges of implementing the EMI basic level in community schools. Teachers predominantly use a mix of English and Nepali in their teaching despite recognising the importance of EMI for enhancing English language skills. Challenges identified include limited English proficiency among teachers, insufficient training and resources, diverse classroom dynamics, assessment difficulties, and inadequate support from educational stakeholders. Additionally, the limited use of English outside the classroom and parental involvement issues further complicate EMI implementation. Addressing these challenges is crucial for effectively integrating EMI in Nepal's basic-level community schools and improving educational outcomes.

Challenges Faced by Students while Implementing EMI

In Nepal, English is taught and utilised as a foreign language, and it becomes more challenging when the foreign language is applied as the medium for instruction in a multilingual classroom context. We gathered the data from the basic level in the community school of Suryodaya Municipality, where the English language is being implemented as a medium of instruction. They were all glad that their schools had adopted EMI. Despite this, they are facing many challenges while learning through the medium of the English language.

In Suryodaya Municipality's community schools, where English has been adopted as a Medium of Instruction (EMI), students have reported several challenges that hinder their learning experience.

While they acknowledge the value of EMI, many struggle with issues such as the fear of making mistakes in English, difficulty completing assessments, and limited exposure to the language—factors that impede their academic progress.

Through their written responses on paper-based questions, students expressed various concerns. For instance, one of the students (Rakesh) mentioned, *"I usually have a fear of making mistakes while speaking and writing in the English language."* While another student (Prashansa) responded, *"I can't complete my assessment because of a language problem" Likewise, another student (Sunita) noted, "We speak English in the classroom, but outside the classroom, we do not have an English-speaking environment."* It shows that the lack of an English-speaking environment outside the classroom limits their exposure to the language. Similarly, another student (Prayash) pointed out, *"It is not easy to learn in the English language because I have learned all the subjects in Nepali except English, where the English teacher also uses the Nepali language to interact."*

Likewise, Manoj and Sofiya described their struggles with understanding and catching all the words spoken by the teacher in English. Roshan highlighted that receiving explanations in Nepali helps him grasp English content better, whereas Sanam and Rohit found it hard to learn academic subjects and understand content fully when taught in English. These responses collectively underscore the gap between the implementation of EMI and the practical challenges students face in adapting to this medium of instruction.

From the above-mentioned data, it can be assumed that students in community schools in Suryodaya Municipality are excited about using EMI. They appreciate this change because they see how it can help their education and future careers. However, despite their enthusiasm, they are facing several challenges in learning through English.

One significant challenge is the fear of making mistakes, as highlighted by Rakesh, which can severely limit students' participation and engagement in class. Prashansa's difficulty in completing assessments due to language problems underscores the impact of limited English proficiency on academic performance. Additionally, Sunita points out that in the absence of opportunities to use English outside the classroom, students' exposure and practice, crucial for language acquisition. Prayash mentions the difficulty of transitioning from learning subjects in Nepali to English, particularly when even the English teacher uses Nepali for interaction, leading to confusion and slowing their adaptation to EMI. Manoj, Sofiya, and Rohit express significant difficulties in understanding English and grasping academic content, indicating that their current English proficiency may not be sufficient for EMI demands. Therefore, teachers should create a supportive classroom environment, offer additional language support, use bilingual resources, employ interactive learning techniques, and gradually increase the use of English while ensuring ongoing professional development.

Strategies Applied to Overcome the Challenges

As we know, the implementation of EMI in diverse classrooms where English is learned as a foreign language gives rise to many challenges. Teachers apply various strategies to overcome these hurdles. One common measure that almost all of them apply is using the Nepali language to elaborate on content matters. A prevalent approach observed among the teachers is the use of the Nepali language to elaborate on content. This strategy helps to clarify and reinforce understanding of English-language material. As Teacher (T1) stated, *"I use the Nepali language*

or students' mother tongue." This response indicates that T1 relies on the Nepali language to explain and elaborate on content, demonstrating a common practice among educators to support comprehension and facilitate effective learning in an EMI context. Likewise, T3 responded, *"I try to teach in simple Nepali language by giving many examples."*

From these responses, it becomes evident that the use of the Nepali language is a key strategy for ensuring students understand the subject content. The non-language teachers emphasise that understanding the content of their subject area is more important than language learning itself. This perspective aligns with the teachers' need to prioritise comprehension over linguistic accuracy when conveying complex subject matter.

In addition to using Nepali, teachers employ other strategies. Science teachers, for instance, use audio-visual devices and group work to enhance the effectiveness of teaching and learning. They believe that using audio-visual materials encourages students to work in groups to better understand the content. As T7 stated, *"I make use of the internet to gain more knowledge about the topic and learn how others present the content. Field trips also help the students understand and gain in-depth knowledge more easily and effectively."*

Moreover, English language teachers apply a task-based approach and make students present their work either in Nepali or English. They, too, rely on Nepali to summarise topics, as they feel more comfortable using their native language. As T9 explained, *"I use a task-based approach with sample presentation. The students are given model solutions to the problem and asked to do the activities. Finally, if not possible, I translate or explain in the native language."*

This shows that while the teachers aim to implement EMI, they must frequently use Nepali to ensure that students grasp the subject matter effectively, especially when resources or understanding are limited.

DISCUSSION

The results of this study indicate that teachers and students of the basic level are facing numerous challenges in implementing EMI in community schools in Suryodaya Municipality. Challenges identified include limited English proficiency among teachers, insufficient training and resources, diverse classroom dynamics, assessment difficulties, and inadequate support from educational stakeholders. Additionally, the limited use of English outside the classroom, parental involvement issues, and a lack of adequate support from responsible sectors further complicate EMI implementation. Students also face challenges, including fear of making mistakes, insufficient English language exposure outside of class, challenges in transitioning from Nepali to English instruction, and difficulties in understanding academic content delivered in English.

To overcome these challenges, teachers apply various strategies, including using the Nepali language to elaborate content, using audio-visual materials, group work, field trips, and task-based approaches. Improving teacher training, resources and infrastructure, assessment tools, and parental involvement, as well as building trust for the quality of education provided in the community schools, are essential for the successful implementation of EMI in community schools. By addressing these challenges and adopting appropriate strategies, community schools can enhance the effectiveness of EMI, ensuring fair and accurate assessment of student learning, and ultimately improving educational outcomes. Since the objective of this research is

related to language learning, we have chosen to view this study through the eyes of Vygotsky's Social Interaction Theory. Vygotsky views that learners learn through social interaction and scaffolding or support from the more knowledgeable other (MKO) and reach the zone of proximal development (ZPD), which is the level of knowledge beyond their present level. "The distance between the actual developmental levels as determined by independent problem solving and the level of potential development as determined through problem-solving under adult guidance, or in collaboration with more capable peers" (Vygotsky, 1978, p. 86).

These findings can be related to Vygotsky's Social Interaction Theory, which emphasises the importance of social interaction in the learning process. The challenges faced by teachers and students in implementing EMI indicate a lack of social interaction between levels of learners and supporters. Teachers who have limited English proficiency face a barrier to effectively connecting with their students and providing clear instruction. Additionally, students who lack English proficiency face similar barriers to understanding the content being taught in the class. Both teachers and students may benefit from increased interaction with support networks, including peers and educational stakeholders, to overcome these challenges and receive the necessary resources and training to succeed. Overall, the findings suggest that effective implementation of EMI in community schools requires a strong social support network and a focus on promoting social interaction in the learning process. Vygotsky's social interaction theory supports the result.

CONCLUSION

Based on the analysis and interpretation of the results, the following conclusions have been derived from the available data and analysis.

The study titled "The Challenges in Implementing English as a Medium of Instruction" investigated the numerous obstacles faced by basic-level community schools in Suryodaya Municipality, Ilam district, in adopting English as a Medium of Instruction (EMI). The findings demonstrate that both teachers and students face significant challenges in this context. Key issues identified include limited English proficiency among teachers, inadequate training and resources, complex classroom dynamics, and insufficient support from educational stakeholders. Moreover, students experience difficulties such as fear of making mistakes, transitioning from Nepali to English instruction, and a lack of exposure to English outside the classroom environment.

To address these challenges, the study emphasises the need for comprehensive and sustained teacher training programs that enhance both language proficiency and pedagogical skills. Additionally, improving educational resources and infrastructure, along with fostering supportive community and parental involvement, are critical to creating an environment conducive to EMI. Implementing strategies such as using the Nepali language to clarify content, incorporating audio-visual materials, and adopting task-based learning can further strengthen the effectiveness of EMI practices.

Ultimately, the successful implementation of EMI requires a holistic approach that not only addresses the immediate linguistic and pedagogical needs but also involves systemic support from educational authorities and the broader community. Addressing these challenges is essential for improving educational outcomes and ensuring that EMI contributes to a more equitable learning environment. This study contributes to the ongoing discourse on EMI in multilingual contexts and underscores the importance of strategic interventions to make EMI a viable and effective instructional medium in community schools.

CONFLICT OF INTEREST

The authors declared no conflict of interest.

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CREDIT RISK MANAGEMENT IN THE COMMERCIAL BANKING SECTOR: REFLECTIONS FROM A HISTORICAL COMPARATIVE STUDY IN NEPAL

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ABSTRACT

Introduction: *Credit risk management underpins the stability and value creation of commercial banks, particularly in markets where capital markets are shallow and bank intermediation is dominant. This study provides a historical baseline of credit management in Nepal by comparing two large institutions—anonymised as Bank A (majority state-owned commercial bank) and Bank B (private commercial bank with foreign JV origins)—over FY 2006/07–2010/11. We assess liquidity, intermediation, profitability, asset quality, and the funding–lending–profit transmission to inform contemporary practice under evolving Nepal Rastra Bank (NRB) guidance.*

Methods: *A retrospective descriptive–comparative design was applied using audited, publicly available financial statements. Ratio analysis covered liquidity (e.g., cash & bank/ deposits), activity/efficiency (loan–deposit and loans/assets), profitability (ROA, interest income/interest expense, yield on loans, EPS), and lending-efficiency/asset-quality (NPL/loans, loan-loss provisions/loans). Pearson correlations examined links between deposits, loans, and net profit. Names are anonymised to mitigate legal/ethical risk; all figures are reported exactly as in source tables.*

Results: *Liquidity buffers were higher at Bank A (cash & bank/ deposits 0.216 vs 0.063; cash/ current deposits 0.948 vs 0.432; cash/savings 0.368 vs 0.172), while both banks' current ratios averaged <1 (Bank B 0.773, Bank A 0.634). Intermediation intensity was stronger at Bank B (loans/deposits 0.707 vs 0.402; loans/assets 0.610 vs 0.384). Profitability favoured Bank B (ROA 0.023 vs 0.014), though Bank A's average loan yield was higher (0.164 vs 0.112). Asset quality and risk costs were markedly better at Bank B (NPL/loans 0.012 vs 0.094; LLP/loans 0.003 vs 0.043). Funding translated more directly into profitable lending at Bank B (deposits↔loans r=0.941; loans↔profit r=0.987) than at Bank A (deposits↔loans r=0.631; loans↔profit r=−0.355).*

Conclusions: *Over 2006–2010, Bank B combined higher intermediation with lower measured credit risk and more reliable earnings transmission, whereas Bank A prioritised immediate liquidity and investments but bore higher risk costs and weaker lending–profit links. These contrasts highlight governance, underwriting discipline, and forward-looking provisioning as*

levers for stronger, more resilient credit management under NRB's current ECL-aligned regime.

Keywords: *credit risk management; commercial banking; Nepal; non-performing loans (NPLs); expected credit loss (ECL); profitability; return on assets (ROA); earnings per share (EPS); loan-loss provisioning; liquidity–intermediation trade-off; credit-risk principles; Nepal Rastra Bank (NRB); comparative study.*

INTRODUCTION

Credit is a contractual transfer of purchasing power today in exchange for repayment (principal plus interest) in the future (Fisher, 2006). In banking, credit risk—the possibility that a borrower fails to meet obligations—sits at the core of value creation and prudential oversight (Jesus & Gabriel, 2006). Global principles, originating with the Basel Committee's Principles for the Management of Credit Risk, emphasise that banks should identify, measure, monitor, and control credit risk across individual exposures and portfolios under board-approved policies, with independent review and supervisory evaluation—standards that continue to anchor sound practice (BCBS, 2000; 2025).

In developing economies with relatively shallow capital markets, commercial banks intermediate most savings and investment flows (Sa, 2006; Tyson, 2023). A large empirical literature associates better-functioning financial systems with stronger long-run growth by improving (i) information production and capital allocation, (ii) monitoring and corporate governance, (iii) risk sharing, (iv) savings mobilisation, and (v) transaction services (Makinde, 2016; Aghion et al., 2018; Levine, 2021). In Nepal, this intermediation operates within the prudential architecture set by Nepal Rastra Bank (NRB). Recent NRB guidance aligned with NFRS 9 embeds expected-credit-loss (ECL) concepts into classification, provisioning, and reporting, reinforcing forward-looking risk management within the supervisory regime (NRB, 2025).

Against this backdrop, the present study provides a historical baseline of credit management in Nepal's commercial banking sector over 2006–2010 using publicly available data for two large institutions anonymised as Bank A and Bank B. To manage legal/ethical risk, banks are anonymous in the manuscript narrative; however, public sources establish that Bank A is a majority state-owned legacy commercial bank (the Government of Nepal held about 51% as of 2024/25), while Bank B is a private commercial bank that began as Nepal's first foreign joint-venture (JV) bank. These institutional characteristics are referenced solely for context and do not imply any claims about current performance. The authors disclose that all analyses refer to historical, public information, and no statements are made about present-day practices or solvency.

Lending remains the mainstay of commercial banking, simultaneously generating earnings and risk (Machiraju, 2008; Jones et al., 2018). Effective credit management, therefore, requires, inter alia, a clearly articulated risk appetite; board-approved policies and well-defined granting criteria; portfolio limits (including single-name and connected-counterparty exposures); strong administration, measurement, and monitoring; arm's-length decision making; and independent, ongoing review—subject to supervisory evaluation and prudential limits consistent with international principles and NRB directives (Smithson, 2003; Hilbers et al., 2005; Bohn & Stein, 2009; Brown & Moles, 2014; NRB, 2020; 2025).

Purpose of the study: The objective is to assess how deposits were mobilised and utilised by Bank A and Bank B during 2006–2010 and what that implied for credit risk and profitability. Specifically, the study (i) evaluates liquidity positions; (ii) examines the volume and composition of loans and advances; (iii) analyses the allocation of deposits across lending and investments; and (iv) investigates relationships among deposits, loans/advances, and net profit. A brief 2025 reflection then situates these historical findings within today's regulatory and market context, shaped by NRB's ECL-aligned guidance.

METHODS

Study design and setting

This is a retrospective, descriptive–comparative study of credit management in two Nepali commercial banks over FY 2006–2010 (five fiscal years). The design matches the article's objective of (i) documenting how deposits were mobilised and utilised; (ii) profiling liquidity, credit, investment, and profitability patterns; and (iii) relating these historical patterns to a short 2025 reflection (presented later, outside Methods). To manage legal/ethical risk, the banks are anonymised as Bank A (majority state-owned legacy commercial bank) and Bank B (private commercial bank with foreign–JV origins). Analyses are confined to historical public information.

Population, sample, and period

The population is the set of licensed commercial banks operating in Nepal during the study window. A purposive sample of two banks (Bank A and Bank B) was selected to represent distinct ownership/heritage profiles that are salient in Nepal's banking history. The period of analysis spans five consecutive fiscal years, 2006–2010. Where reports followed the Nepali fiscal year (mid-July to mid-July), figures were treated consistently on a fiscal-year basis.

Data sources and collection

Primary evidence consists of published annual reports of Bank A and Bank B (financial statements, notes, management discussion), complemented by Nepal Rastra Bank (NRB) publications (e.g., Banking & Financial Statistics, Unified Directives, relevant circulars) for category definitions and cross-checks. Where needed, older prospectuses, stock exchange filings, and archived disclosures were used to reconcile series. No non-public or confidential data was accessed.

Data were extracted to a structured spreadsheet with the following steps: (i) transcribe audited line items exactly as reported; (ii) standardize labels (e.g., "loans and advances," "investment," "deposits"); (iii) reconcile any restatements across years; (iv) flag obvious transcription anomalies for re-check against source PDFs; and (v) compute ratios from standardized components. All figures are in NPR and unadjusted for inflation (see Limitations).

Variables and measures

Analyses emphasise credit-management outcomes observable in public financials. For each bank (b) and year (t), indicators and formulas are as follows.

Liquidity

ι) Current Ratio = Current Assets / Current Liabilities (reported for completeness, though less diagnostic for banks).

ιι) Cash & Bank to Total Deposits = (Cash + Bank Balances) / Total Deposits.

ιιι) Cash & Bank to Current Deposits = (Cash + Bank Balances) / Current Deposits.

ιϖ) Cash & Bank to Interest-Sensitive Deposits = (Cash + Bank Balances) / Savings Deposits (operationalised as the most rate-sensitive category during the period).

Activity / Efficiency

ι) Loan-to-Deposit Ratio (LDR) = Loans and Advances / Total Deposits.

ιι) Loans to Total Assets = Loans and Advances / Total Assets.

ιιι) Investment to Deposits = Total Investment / Total Deposits.

Profitability

ι) Interest Income to Interest Expense = Interest Income / Interest Expense (spread proxy).

ιι) Return on Loans and Advances = Net Profit / Loans and Advances.

ιιι) Return on Assets (ROA) = Net Profit / Total Assets.

ιϖ) Interest Yield on Loans = Interest Income / Loans and Advances.

ϖ) Earnings per Share (EPS) = Net Profit after Tax / Weighted Average Common Shares Outstanding (reported where disclosed).

Lending Efficiency / Asset Quality

ι) Non-Performing Loans (NPL) Ratio = NPL / Loans and Advances (used when disclosed in the period's reports).

ιι) Loan-Loss Provision to Loans (LLP/Loans) = Loan-Loss Provision / Loans and Advances. *Note:* Where NPL series are missing or non-comparable, LLP/Loans is used as a consistent proxy for risk costs.

Line items are taken as reported in audited financial statements. If a label changes (e.g., consolidation of sub-categories) and the mapping is explicit in notes, a consistent series is constructed, and the change is documented.

Analytical approach

The analysis proceeds in three layers:

1. Descriptive profiles and trends

For each indicator and bank, year-by-year values are presented alongside:

ι) Arithmetic Mean = (sum of annual values) / N;

ιι) Sample Standard Deviation = the square root of the average squared deviation from the mean;

ιιι) Coefficient of Variation (CV) = (Standard Deviation / Mean) × 100%. Linear time trends are summarised by ordinary least squares slopes of each indicator on year (estimated separately for each bank).

2. Association among funding, credit, and profitability

To address mobilisation and performance, Pearson correlations are computed between Deposits, Loans & Advances, and Net Profit within each bank and for a pooled panel with bank fixed-effects summaries. r^2 values describe variance explained in bivariate fits. Given N = 5 per bank, correlation magnitudes are interpreted cautiously and triangulated with trend evidence. For transparency, the probable error (P.E.) of r may be reported as $P.E. = 0.6745 \times \text{sqrt}(1 - r^2) / \text{sqrt}(N)$ when useful for small-sample interpretation.

3. Comparative assessment

Bank A vs. Bank B comparisons emphasise differences in means (informally, due to small N), relative variability (CV), and direction/magnitude of trend slopes for key ratios: LDR, Loans/Assets, Investment/Deposits, ROA, Interest Yield, LLP/Loans, and—where available—NPL/Loans.

No leverage, risk-weighted assets, or capital-adequacy metrics are modelled because consistent series were not the focus of the credit-management objectives for 2006–2010.

Data management, quality, and reproducibility

A two-pass validation was applied. First, all computed ratios were re-checked against component numerators/denominators; second, any outliers triggered a return to the source page for confirmation. All calculations are captured in a transparent workbook with formula cells visible. A de-identified dataset (Bank A/Bank B labels only) and the calculation workbook can be shared upon acceptance.

Ethical considerations and disclosures

Only public documents were used; no confidential information was accessed. Bank identities are anonymised in the manuscript (Bank A/Bank B). The author's views are personal and do not represent the employer. The study makes no claims about present-day practices or solvency.

RESULTS

Throughout this section, the two sample institutions are anonymised as Bank A (state-owned legacy commercial bank) and Bank B (private commercial bank with foreign-JV origins). All figures cover FY 2006/07–2010/11 and are reproduced exactly from the source tables; only names were anonymised.

Liquidity position

Table 1. Current Ratio (Bank B and Bank A)

	Bank B			Bank A		
Year	**Current Assets**	**Current Liabilities**	**Ratios**	**Current Assets**	**Current Liabilities**	**Ratios**
2006/07	17509.137	24817.790	0.91	17741.063	31164.963	0.57
2007/08	25988.555	33950.842	0.71	17178.295	33482.241	0.51
2008/09	31515.334	39854.024	0.79	27186.689	47178.989	0.58
2009/10	36787.150	47275.782	0.78	33702.235	45075.167	0.75
2010/11	42945.158	52167.906	0.82	37085.147	48683.083	0.76
Average	Average	Average	0.773			0.634
S.D	S.D	S.D	0.043			0.113
C.V	C.V	C.V	5.595%			17.891%

Bank B's mean current ratio exceeded Bank A's, with lower variability; both averages remained below 1.0, reflecting banking-sector balance-sheet structure.

Table 2. Cash & Bank Balance to Total Deposit Ratio

Year	Cash & Bank Balance	Bank B Total Deposit	Ratios	Cash & Bank Balance	Bank A Total Deposit	Ratios
2006/07	1399.825	23342.285	0.060	7174.06	35829.760	0.200
2007/08	2671.141	31915.047	0.084	7117.29	39014.200	0.182
2008/09	3372.512	37348.255	0.090	9171.790	45194.232	0.203
2009/10	1400.097	46340.700	0.030	10141.280	42882.039	0.236
2010/11	2458.549	49608.376	0.050	12013.865	46808.435	0.257
Average	Average	Average	0.063			0.216
S.D	S.D	S.D	0.025			0.030
C.V	C.V	C.V	39.046%			13.942%

Bank A maintained a higher cash-to-deposits cushion than Bank B across the period; Bank B's ratio dipped notably in 2009/10.

Table 3. Cash & Bank Balance to Current Deposit Ratio

Year	Cash & Bank Balance	Bank B Current Deposit	Ratios	Cash & Bank Balance	Bank A Current Deposit	Ratios
2006/07	1399.825	3395.240	0.412	7174.06	7826.294	0.917
2007/08	2671.141	5284.368	0.505	7117.29	8178.393	0.870
2008/09	3372.512	5480.533	0.615	9171.790	9923.275	0.924
2009/10	1400.097	7904.619	0.177	10141.280	10942.415	0.927
2010/11	2458.549	5456.894	0.451	12013.865	10905.854	1.102
Average	Average	Average	0.432			0.948
S.D	S.D	S.D	0.162			0.089
C.V	C.V	C.V	37.440%			9.381%

Against current deposits, Bank A held a substantially stronger immediate liquidity buffer throughout.

Table 4. Cash & Bank Balance to Saving Deposits Ratio

Year	Cash & Bank Balance	Bank B Saving Deposit	Ratios	Cash & Bank Balance	Bank A Saving Deposit	Ratios
2006/07	1399.825	10187.354	0.137	7174.06	23245.625	0.309
2007/08	2671.141	12159.966	0.220	7117.29	21284.329	0.334
2008/09	3372.512	14620.407	0.231	9171.790	31284.260	0.293
2009/10	1400.097	13783.585	0.102	10141.280	27313.755	0.371
2010/11	2458.549	14288.520	0.172	12013.865	22501.339	0.534
Average	Average	Average	0.172			0.368
S.D	S.D	S.D	0.054			0.097
C.V	C.V	C.V	31.62%			26.394%

Relative to savings deposits, Bank A's cushion exceeded Bank B's on average, with a greater late-period increase.

Activity/efficiency

Table 5. Loans & Advances to Total Deposit Ratio

Year	Bank B Loan & Advances	Bank B Total Deposit	Bank B Ratios	Bank A Loan & Advances	Bank A Total Deposit	Bank A Ratios
2006/07	15545.778	23342.285	0.666	9756.16	35829.760	0.272
2007/08	21365.053	31915.047	0.669	10584.781	39014.200	0.271
2008/09	27589.933	37348.255	0.739	17614.898	45194.232	0.390
2009/10	32268.873	46340.700	0.696	23560.955	42882.039	0.549
2010/11	38034.097	49608.376	0.767	24671.281	46808.435	0.527
Average	Average	Average	0.707			0.402
S.D	S.D	S.D	0.044			0.134
C.V	C.V	C.V	6.232%			33.245%

Bank B consistently deployed a larger share of deposits into loans than Bank A, implying more aggressive intermediation.

Table 6. Loans & Advances to Total Assets Ratio

Year	Bank B Loan & Advances	Bank B Total Assets	Bank B Ratios	Bank A Loan & Advances	Bank A Total Assets	Bank A Ratios
2006/07	15545.778	27253.393	0.57	9756.16	35919.000	0.272
2007/08	21365.053	37132.759	0.575	10584.781	39258.000	0.270
2008/09	27589.933	43867.397	0.629	17614.898	47559.110	0.370
2009/10	32268.873	52079.725	0.620	23560.955	44736.652	0.527
2010/11	38034.097	58099.619	0.655	24671.281	51158.657	0.482
Average	Average	Average	0.610			0.384
S.D	S.D	S.D	0.036			0.118
C.V	C.V	C.V	5.918%			30.778%

Loans as a share of assets were higher at Bank B on average; Bank A's ratio rose after 2008/09.

Table 7. Total Investment to Total Deposit Ratio

Year	Bank B Total Investment	Bank B Total Deposit	Bank B Ratios	Bank A Total Investment	Bank A Total Deposit	Bank A Ratios
2006/07	8945.310	23342.285	0.383	24246.000	35829.760	0.677
2007/08	9939.771	31915.047	0.311	26657.000	39014.200	0.683
2008/09	10826.379	37348.255	0.289	13397.559	45194.232	0.296
2009/10	13600.916	46340.700	0.293	5784.372	42882.039	0.135
2010/11	13003.205	49608.376	0.262	7585.544	46808.435	0.162
Average	Average	Average	0.308			0.391
S.D	S.D	S.D	0.046			0.271
C.V	C.V	C.V	14.801%			69.395%

Both banks' investment-to-deposit ratios trended down; Bank A started higher and exhibited more volatility.

Profitability

Table 8. Interest Income to Interest Expenses Ratio

Year	Bank B Interest Income	Bank B Interest Expenses	Ratios	Bank A Interest Income	Bank A Interest Expenses	Ratios
2006/07	1587.758	555.710	2.857	2049.169	774.000	2.648
2007/08	1978.696	758.436	2.609	1849.354	773.294	2.392
2008/09	2798.486	1,153.280	2.427	2690.058	791.710	3.398
2009/10	4047.725	1,960.107	2.065	3067.553	909.990	3.371
2010/11	5258.269	2,946.691	1.784	3740.719	1482.204	2.524
Average	Average	Average	2.348			2.866
S.D	S.D	S.D	0.428			0.482
C.V	C.V	C.V	18.205%			16.802%

The interest income-to-expense ratio declined for Bank B over time; Bank A peaked around 2008/09–2009/10.

Table 9. Return on Loans & Advances

Year	Bank B Net Profit	Bank B Loan and Advances	Ratios	Bank A Net Profit	Bank A Loan and Advances	Ratios
2006/07	673.959	15545.778	0.043	1328.000	9756.16	0.136
2007/08	746.468	21365.053	0.035	250.131	10584.781	0.024
2008/09	1031.053	27589.933	0.037	894.254	17614.898	0.051
2009/10	1139.011	32268.873	0.035	249.382	23560.955	0.011
2010/11	1337.745	38034.097	0.035	128.346	24671.281	0.005
Average	Average	Average	0.035			0.045
S.D	S.D	S.D	0.004			0.048
C.V	C.V	C.V	9.567%			106.238%

Return on loans and advances eased as loan books expanded; Bank A's series showed higher variability.

Table 10. Net Profit to Total Assets (ROA)

Year	Bank B Net Profit	Bank B Total Assets	Ratios	Bank A Net Profit	Bank A Total Assets	Ratios
2006/07	673.959	27253.393	0.025	1328.000	35919.167	0.037
2007/08	746.468	37132.759	0.020	250.131	39258.334	0.006
2008/09	1031.053	43867.397	0.024	894.254	47559.110	0.019
2009/10	1139.011	52079.725	0.022	249.382	44736.652	0.006
2010/11	1337.745	58099.619	0.023	128.346	51158.657	0.003
Average	Average	Average	0.023			0.014
S.D	S.D	S.D	0.002			0.014
C.V	C.V	C.V	7.740%			101.437%

ROA was higher and more stable for Bank B; Bank A's ROA fluctuated sharply.

Table 11. Interest Income to Total Loans & Advances

	Bank B			Bank A		
Year	**Interest Income**	**Loan & Advances**	**Ratios**	**Interest Income**	**Loan & Advances**	**Ratios**
2006/07	1587.758	15545.778	0.102	2049.169	9756.16	0.210
2007/08	1978.696	21365.053	0.091	1849.354	10584.781	0.175
2008/09	2798.486	27589.933	0.101	2690.058	17614.898	0.153
2009/10	4047.725	32268.873	0.125	3067.553	23560.955	0.130
2010/11	5258.269	38034.097	0.138	3740.719	24671.281	0.152
Average	Average	Average	0.112			0.164
S.D	S.D	S.D	0.019			0.030
C.V	C.V	C.V	17.0%			18.454%

Bank A recorded a higher average interest income relative to loans; Bank B's yield increased late in the period.

Table 12. Earnings Per Share (EPS)

Bank	2006/07	2007/08	2008/09	2009/10	2010/11	Average
BANK B	1.40	1.08	1.07	0.786	0.706	1.008
BANK A	0.596	0.628	2.350	0.655	0.337	0.913

EPS for both banks peaked around 2008/09 and then declined; Bank B's five-year average slightly exceeded Bank A's.

Lending efficiency/asset quality

Table 13. Loan-Loss Provision to Loans & Advances

	Bank B			Bank A		
Year	**Loan Loss Provision**	**Loan & Advances**	**Ratios**	**Loan Loss Provision**	**Loan & Advances**	**Ratios**
2006/07	3.208	15545.778	0.0001	698.127	9756.16	0.072
2007/08	37.952	21365.053	0.002	720.427	10584.781	0.068
2008/09	22.583	27589.933	0.001	567.839	17614.898	0.032
2009/10	355.829,	32268.873	0.011	453.798	23560.955	0.019
2010/11	109.470	38034.097	0.003	543.200	24671.281	0.022
Average	Average	Average	0.003			0.043
S.D	S.D	S.D	0.004			0.025
C.V	C.V	C.V	132.098%			59.379%

LLP-to-loans was very low on average for Bank B; Bank A's provisioning was higher but trended down, indicating improving asset quality.

Table 14. Non-Performing Loans to Loans & Advances

Year	Bank B Non-performing Loan	Bank B Loan & Advances	Bank B Ratios	Bank A Non-performing Loan	Bank A Loan & Advances	Bank A Ratios
2006/07	178.293	15545.778	0.011	1317.114	9756.16	0.135
2007/08	161.085	21365.053	0.008	1856.332	10584.781	0.175
2008/09	224.817	27589.933	0.008	966.723	17614.898	0.055
2009/10	487.541	32268.873	0.015	1219.673	23560.955	0.052
2010/11	689.851	38034.097	0.018	1344.118	24671.281	0.054
Average	Average	Average	0.012			0.094
SD	SD	SD	0.005			0.057
C.V	C.V	C.V	37.55%			60.868%

Bank B's NPL ratio remained well below Bank A's; both improved at points within the window.

Correlation analysis

Table 15. Deposits vs. Loans & Advances (Correlation)

Bank	Correlation (rxy)	P.E.	6 P.E.
Bank B	0.941	0.0022	0.0132
Bank A	0.631	0.036	0.216

A strong, statistically significant positive association between deposits and loans & advances is evident for Bank B. A positive association between deposits and loans & advances is observed for Bank A over the five years.

Table 16. Loans & Advances vs. Net Profit (Correlation)

Bank	Correlation (rxy)	P.E.	6 P.E.
Bank B	0.987	0.0076	0.0461
Bank A	-0.355	0.018	0.108

A very strong, statistically significant positive association between loans & advances and net profit exists for Bank B. For Bank A, the correlation between loans & advances and net profit is negative and not statistically significant across the period.

Overall findings reflect that Bank B exhibits stronger and more stable profitability with lower observed credit risk (lower NPL and LLP ratios), while Bank A maintains comparatively higher immediate liquidity buffers and a larger allocation to investments relative to deposits. Correlation results indicate funding growth translated more directly into loan growth and profits at Bank B than at Bank A over FY 2006/07–2010/11.

DISCUSSION

This comparative study assessed credit-risk management in two Nepali commercial banks over FY 2006/07–2010/11, anonymised as Bank A (majority state-owned, legacy commercial bank) and Bank B (private commercial bank with foreign–JV origins). Drawing on audited financials, liquidity, activity/efficiency, profitability and lending-efficiency ratios were analysed, supplemented by correlation tests between deposits, loans and advances, and net profit. The aim is to interpret the five-year patterns through the lens of international guidance and Nepal's supervisory context while preserving all reported statistics.

Liquidity, buffers, and intermediation trade-offs

Both institutions operated with average current ratios below unity (Bank B: 0.773; Bank A: 0.634), a common feature of deposit-taking balance sheets). Bank A consistently maintained larger on-balance-sheet cushions—cash and bank balance to total deposits averaged 0.216 versus 0.063 at Bank B; cash to current deposits averaged 0.948 vs. 0.432; and cash to savings deposits averaged 0.368 vs. 0.172. While such buffers support withdrawal needs, excessive liquidity can depress earnings if not redeployed into remunerative assets. International principles, therefore, emphasise board-approved risk appetite and policies that balance funding resilience with prudent credit intermediation (Basel Committee on Banking Supervision [BCBS], 2000, 2025).

Intermediation intensity and portfolio mix

Bank B consistently transformed a larger share of deposits into loans (mean loans/deposits 0.707 vs. 0.402) and held a higher loans-to-assets mix (0.610 vs. 0.384). Bank A, in contrast, allocated a higher fraction of deposits to investments (0.391 vs. 0.308) with greater volatility. The finance-and-growth literature links effective intermediation and information production to superior real-sector outcomes (Levine, 2005; Popov, 2018). Yet rapid loan expansion without commensurate underwriting capacity can raise future credit losses—an issue supervisors repeatedly flag in emerging banking systems (Drucker & Puri, 2005; Jansen et al., 2025).

Earnings capacity and margin behaviour

Despite a declining interest income–to–interest expense ratio at Bank B (mean 2.348 vs. Bank A's 2.866), Bank B delivered more stable earnings on assets (ROA mean 0.023 vs. 0.014), while Bank A's returns on loans were higher on average (0.048 vs. 0.035) but highly volatile (C.V. 106.2%). Cross-country evidence attributes variation in margins and profitability to operating costs, market structure, regulation, and risk (Financial, 2001; Pasiouras et al., 2006; Ghosh & Petrova, 2021; O'Connell, 2023). In South-Asian settings, higher loan-to-deposit ratios and cost discipline can support net interest margins provided asset quality is preserved (Salika & Ao, 2018; Afzal et al., 2021).

Asset quality, provisioning, and risk costs

Lending-efficiency indicators point to materially lower credit risk at Bank B. Average non-performing loans (NPLs) to loans were 0.012 at Bank B vs. 0.094 at Bank A, and loan-loss provisions (LLP) to loans averaged 0.003 vs. 0.043. Empirical research links elevated NPLs with weaker profitability and constrained lending (Klein, 2013; Huljak et al., 2022). The contrast in our sample is consistent with these channels: Bank B's lower NPL/LLP ratios coexisted with stronger ROA, while Bank A's higher risk costs likely diluted earnings transmission.

From deposits to loans to profits: strength of transmission

Correlation results reinforce the ratio evidence. For Bank B, deposits and loans were strongly associated ($r = 0.941$), and loans and net profit were very strongly associated ($r = 0.987$). For Bank A, the deposits–loans link was positive ($r = 0.631$), but the loans–profit correlation was negative and not statistically significant ($r = -0.355$). These patterns suggest that Bank B's underwriting and pricing preserved risk-adjusted returns more effectively, whereas Bank A's lending generated weaker earnings after risk costs. Similar mechanisms are documented in studies relating cost efficiency, risk management, and profitability in banks (Athanasoglou et al., 2006; Sun & Chang, 2011; Matthews, 2013; Oyeniyi et al., 2021).

Regulatory context and 2025 reflections

Since 2010, Nepal Rastra Bank (NRB) has strengthened supervisory expectations, including unified directives on asset classification and provisioning (NRB, 2020) and the adoption of NFRS-9 expected-credit-loss (ECL)–aligned guidance (NRB, 2025). Globally, the Basel

Committee has reaffirmed governance, credit-granting standards, portfolio monitoring, and internal control expectations (BCBS, 2000, 2025). Viewed against these frameworks, the 2006–2010 baseline highlights imbalances—excess liquidity with weak deployment at Bank A; a more active intermediation model with comparatively disciplined asset quality at Bank B—that contemporary, forward-looking regimes aim to identify earlier and remediate more decisively.

Limitations and future research

Three constraints qualify the findings. First, the study of two commercial banks and a five-year window limits sample and cycle coverage. Second, ratio-based and bivariate correlations cannot control for macroeconomic shocks, market power, or cost heterogeneity. Third, public financial statements do not reveal loan-level underwriting quality or internal controls. Extending the analysis to post-2010 data with panel methods and ECL-based stress testing would strengthen causal interpretation and policy relevance.

CONCLUSION

Across 2006–2010, Bank B combined higher intermediation (loans/deposits 0.707; loans/assets 0.610) with lower measured credit risk (NPL/loans 0.012; LLP/loans 0.003) and stronger earnings transmission (ROA 0.023; r_deposits, loans = 0.941; r_loans, profit = 0.987). Bank A prioritised immediate liquidity (cash and bank balance to deposits 0.216; stronger cushions against current and savings deposits) but showed weaker intermediation intensity (loans/deposits 0.402; loans/assets 0.384) and higher risk costs (NPL/loans 0.094; LLP/loans 0.043), consistent with diluted profitability.

These contrasts accord with international evidence that profitability depends jointly on margins, efficiency, and asset quality, and with supervisory principles emphasising calibrated risk appetite, sound credit-granting, and rigorous monitoring. For policy and practice, the historical baseline offers a benchmark for assessing progress under NRB's updated directives and NFRS-9 ECL guidance. Future work should revisit the comparison using post-2010 data and multivariate designs to identify the drivers of profitability and credit risk under current rules.

CONFLICT OF INTEREST

The authors declared no conflict of interest.

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CAPITAL STRUCTURE AND PROFITABILITY OF A COMPARATIVE STUDY ON GOVERNMENT AND JOINT VENTURE BANKS IN NEPAL

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ABSTRACT

The study intends to look into how capital structure affects the Nepalese Government and the Joint Venture Bank's profitability. The statistical analysis of the study includes the secondary data. Using software for analysis, a descriptive and causal comparative analysis has been conducted by gathering data from bank websites and using correlations and multiple regression models for hypothesis testing. Out of the entire population, 2 Government and 3 joint venture banks have been taken as a sample for the study. The capital structure and profitability have been investigated as a cause-and-effect relationship using a causal comparative research design. In this study, NIM is used as a dependent variable, and leverage ratio, bank size, liquidity ratio, and capital ratio are independent variables. As a statistical tool, the following tools are used: mean, standard deviation, correlation, multiple regression model, and hypothesis testing. Excel and SPSS are both used to evaluate those variables. Leverage Ratio and bank size have a negative and significant impact on NIM in Nepal's government banks. The Liquidity Ratio shows an insignificant and positive effect on NIM. The capital ratio has a significant and favourable impact on the NIM of government banks. Whereas the Leverage Ratio has an insignificant positive impact on the NIM of Joint Venture Banks. Bank Size has a significant negative relation with NIM. Liquidity Ratio shows a significant and positive relation with NIM. Capital ratio has an insignificant negative impact on the NIM of Joint Venture Banks. However, Banks should value the significance of other variables.

Keywords: *leverage ratio, bank size, liquidity ratio and capital ratio.*

INTRODUCTION

One of the most used terms in financial research is capital structure. We discuss a number of capital structure theories, including the Pecking Order Theory, the NI Approach, the NOI Approach, the MM Approach, and the Trade-off Theory. We are going to evaluate other firm-specific factors, such as profitability. Our research demonstrated the connection between several capital structure factors and financial leverage. Based on our investigation, we have also examined a number of possible future patterns (Gupta & Khanna, 2022).

This study focuses on the need for a theoretical justification of the inverse relationship between capital structure and firm performance. It is the first to use logical reasoning to examine the moderating effects of firm size between these factors by focusing on accounting measurements of business performance. As a result of the potential for variation (IQBAL, 2022).

We take note of several studies that looked at low-income emerging nations, like Ethiopia, to investigate the relationship between capital structure and bank profitability, while multiple studies examined the effect of non-interest revenue on profitability. Previous research concentrated on evaluating the impact of capital structure alone on bank profitability (Ayalew, 2021). Again, we discuss past research that looked at one of Asia's developing countries, like Bangladesh (Rana-Al-Mosharrafa & Islam, 2021).

However, little research has been done on how capital structure, operational efficiency, and non-interest revenue all work together to affect the banking industry's profitability (Hossain & Ahamed, 2021). Capital structure is the contrast or balance between domestic and foreign capital. In this case, both short-term and long-term debt are considered foreign capital. The objective is to increase the company's market value even when retained earnings and ownership interests make up the company's own funds (Brigham & Ehrhardt, 2011).

Capital is one of the most important components of a corporation. In actuality, an organisation could not function without funds. Any type of business, from a small convenience store to a major group of companies, cannot be started without funding. Every organisation starts with a balance of zero and only exists when its promoters, owners, or shareholders contribute money. Every organisation should have enough money to run. Although banks are the primary source of capital, banks also need to create capital in order to run their operations. The importance of a bank's depositor capital stems from its obligation to the public. Therefore, banks must have sufficient capital to safeguard the interests of depositors (Patheja, 1994).

Commercial banks get a substantial amount of deposits from the general public. Depositors find comfort and security in knowing that their money is safe when they put it in a bank. However, what would happen if the bank lacked the capital necessary to serve as a buffer against future unexpected losses? In order to protect its counterparties and depositors from risks like credit and market risk, a bank must have enough capital. If this weren't the case, banks would use all of the depositors' money for personal benefit, which would result in losses for the depositors. As of right now, B-class and C-class financial institutions are required by the NRB, which regulates banks and financial institutions in Nepal, to employ DCGC to cover individual depositors up to two lakhs. (Paudel, 2009).

The study's major goal is to determine the causes and effects of capital structure on the profitability of those banks from 2069–2070 to 2078–2079 BS in terms of financialperformance by selecting two government and three joint venture banks as sample banks. The objectives are listed as follows: (i) To examine the impact of leverage ratio on profitability (NIM), (ii) To analyze the impact of bank size on profitability (NIM), (iii) To assess the impact of liquidity ratio on profitability (NIM), and (iv) To examine the impact of capital ratio on profitability (NIM).

THEORETICAL FRAMEWORK

In broad terms, the theoretical framework is the foundation upon which the theory of a research study is constructed. This indicates that it describes the underlying theory of the research study and clarifies the reasons behind the emergence of the research challenge. This part will provide some development of the hypotheses and motives behind the research. Along with the theme and supporting elements, the theory supporting the research study will also be selected. The dependent

and independent factors that influence the research study will be the main topic of this section of the investigation.

A variety of independent factors have diverse impacts on the bank's profitability. However, this will depend on the kind of investment that investors are ready to make. This suggests that whereas short-term investors usually focus primarily on technical and economic factors, long-term investors usually depend on fundamental characteristics as well. Short-term variables also take into consideration the market's state of mind. Some of these variables are presented here because economic difficulties account for the majority of the variables included in this study. The following graphic presents the theoretical context for these variables.

Capital Structure
Independent Variable
- Leverage Ratio
- Bank Size
- Liquidity Ratio
- Capital Ratio (CAP)

Profitability
Dependent Variable
- Net Interest Margin (NIM)

(Source: Mehzabin, Shahriar, Hoque, Wanke, & Azad, 2022).

NIM is the dependent variable because the research study is based on data from the financial report. Furthermore, NIM is directly impacted by other variables. Because they are unaffected by other variables, the leverage ratio, bank size, liquidity ratio, capital ratio (CAP), and operating efficiency will also be considered independent variables of the government banks and joint venture banks.

METHODS

Research methodology is a systematic way of approaching the research question. Stated in distinct ways, research methodology encompasses the methods and approaches employed during the entirety of the study. The phrase "research methodology" describes the several steps a researcher must follow to analyze a topic with particular objectives in mind, as well as the rationale behind each action (Kothari, 1994:9). Under the (Gebrayel et al., 2018; Mercier Suissa et al., 2018; Salloum et al., 2019; Salloum et al., 2015), this study's estimated model is reliable and consistent. Additionally, panel data estimations incorporate bank-specific and panel-specific variables that involve random aspects and account for persistent variability over time, resulting in an effective conclusion.

Additionally, this econometric approach allows the assessment of dynamic impacts, which are usually difficult to establish by implementing cross-sectional or time series investigations (Athanasoglou et al., 2008).

Research methodology refers to the entire process by which we attempt to resolve problems or provide answers to inquiries. It is based on a number of theories, notions, and procedures. It's a technique for approaching the study problem methodically. It is the process of identifying a

problem's solution by the purposeful and methodical collection, assessment, and interpretation of data. It includes several kinds of research designs, population and sample, data sources, methods for gathering and processing data, and tools and approaches for analysing data (software to be used in the research, statistical and financial instruments). Various dependent and independent variables are also included (Arellano & Bover, 1995).

The process used to collect information and data to ensure that business decisions can be made. The methodology may include published research, interviews, surveys, and other research techniques, along with current and historical data. Research technique refers to the several steps that researchers perform sequentially while analysing a topic with certain objectives in mind. To prepare this thesis, a variety of data from the NRB-provided balance sheet, profit and loss account, and financial statement of the Commercial Bank have been separated, along with information from the annual report of Banking from a few books and publications. After the relevant data has been sorted, financial and statistical methods have been used to study and interpret the different financial components of Commercial banks. Basically, how the report has been put together. The term "research design" refers to the framework and plan that a researcher prepares to conduct their study from start to finish. The causes and effects of the capital structures and profitability of five government and joint venture banks are examined using a causal comparative research design. The comparative research approach has been utilised in this context due to its focus on historical occurrences. It is a process for obtaining, evaluating, verifying, and interpreting previous evidence in an orderly and objective manner to conclude. The management of capital structures in commercial banks also takes historical data into reference. For this specific examination, a descriptive and analytical research approach has been employed. This helps in gathering sufficient facts and information in accordance with needs. The 22 commercial banks that are now in operation across the country make up the study's population. Out of 3 government banks and 6 joint venture banks, 2 government and 3 joint venture banks are included in the study's sample. In a casual comparison analysis, the researcher studied the capital structure and profitability of Nepal's commercial banks. Only two government and three joint venture banks have decided to use purposive sampling to provide a sample for a case-comparative study. In this manner:

Table 1. List of Sampled Banks with the Number of Observations

S.N.	Name of commercial	Abbreviations	Sample Period	No. of Observations
1	Agriculture DevelopmentBank	ADBL	2069/70-2078/79	10
2	Nepal Bank Limited	NBL	2069/70-2078/79	10
3	Everest Bank Limited	EBL	2069/70-2078/79	10
4	Himalayan Bank Limited	HBL	2069/70-2078/79	10
5	Nabil Bank Limited	NABIL	2069/70-2078/79	10

The researcher has chosen ADBL, NBL, EBL, HBL and NABIL Bank. Because several commercial banks have been founded.

Table 2. Description of Variables

Variables	Measures	References
Leverage Ratio	Computed by the ratio of total debt to total assets.	Ayalew (2021), Mkadmi et al. (2021)
Bank Size	Bank size, computed by the	Adusei (2015), Ali and Puah (2019),natural logarithm of total assets ln (TA)
Liquidity Ratio	Computed by the ratio of Current Assets to Current Liabilities.	
CAP	Capital ratio, computed by the	Rana-Al-Mosharrafa and Islam (2021),the ratio of total equity to total assets.
NIM	A measure of net interest margin, computed by the ratio of investment return minus interest expenses to average earning assets.	

All independent variables and dependent variables can be assessed with the diverse data analysis method known as multiple regression. Cohen et al. state that nonlinear relationships, quantitative or qualitative independent variables, and the influence of one or more factors with or without the influence of other variables are all acknowledged in this study. Regression analysis is a statistical technique for examining relationships between variables. There are various methods for modelling and assessing multiple variables, with the relationship between the dependent variable and one or more independent variables usually the main focus.

Profitability = f (LR, BS, CRR, CAP)

We will try to find out the effect of the variable on Net Interest Margin. The model is given below:

$$NIM = \beta_0 + \beta_1 LR + \beta_2 BS + \beta_3 CRR + \beta_4 CAP + \in_i \quad \text{(i)}$$

Where,

β_0 = Constant term

NIM = Net Interest Margin

LR = Leverage Ratio

BS = Bank Size

CRR = Liquidity Ratio

CAP = Capital Ratio

$\beta_1, \beta_2, \beta_3, \beta_4$ = regression coefficient

$\in_i$ = error terms

Data Analysis

The presentation of the data provides the basic framework for classifying and organising the data for the analysis. After data collection is complete, the data will be in raw form. The data will still be kept in early estimations, data collection forms, and note cards. Data analysis includes data organising, tabulation, statistical analysis, and conclusion. This chapter's topics are data collection, analysis, and presentation. NEPSE has classified the listed companies into various sectors, and samples were obtained according to these sectors.

RESULTS

This section's main objectives are data analysis and presentation. This section analyses the collected data through a range of graphical displays in addition to financial and statistical methods. The comparative profit and loss statements are included for the years 2069–2070 and 2078–2079, as well as the comparative balance sheet.

Table 3. Descriptive Statistics of Government Banks

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Leverage Ratio	20	4.12	14.41	6.2387	2.38640
Bank Size	20	24.98	26.28	25.6125	.40780
Liquidity Ratio	20	4.06%	36.21%	20.8685%	10.55431%
Capital Ratio	20	6.49%	19.54%	14.8160%	3.39973%
Net Interest Margin	20	2.86%	6.31%	4.5355%	1.10380%
Valid N (listwise)	20	-	-	-	-

Table 3 shows the leverage ratio from a minimum of 4.12 to a maximum of 14.41, leading to an average of 6.24. The size presented by the total assets of the government banks during the study period is 25.61, with a minimum of 24.98 and a maximum of 26.28. Likewise, the liquidity ratio has a minimum value of 4.06 per cent and a maximum of 36.21 per cent with a mean of 20.87 per cent. The average capital ratio of the selected government banks during the study period is 14.81 per cent, with a minimum value of 6.49 per cent and a maximum of 19.54 per cent. And, the NIM has a minimum value of 2.86 per cent and a maximum of 6.31 per cent, with a mean of 4.54 per cent. Therefore, the maximum mean and minimum meanstatistics of the sampled government banks are Bank Size, from a minimum of 24.98 to a maximum of 26.28, leading to an average of 25.61, and the net interest margin has a minimum and maximum mean statistic of the sampled banks is 2.86 per cent and 6.31 per cent, with a mean of 4.54 per cent.

Table 4. *Descriptive Statistics of Joint Venture Banks*

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Leverage Ratio	30	6.91	13.39	9.3968	1.79163
Bank Size	30	24.84	26.75	25.6225	.46881
Liquidity Ratio	30	3.66%	37.52%	17.8913%	9.30476%

Capital Ratio	30	6.95%	12.64%	9.8839%	1.61429%
Net Interest Margin	30	1.99%	5.15%	3.5193%	0.72571%
Valid N (listwise)	30	-	-	-	-

Table 4 presents the leverage ratio from a minimum of 6.91 to a maximum of 13.39, leading to an average of 9.39. The size presented by the total assets of the joint venture banks during the study period is 25.62, with a minimum of 24.84 and a maximum of 26.75. Likewise, the liquidity ratio has a minimum value of 3.66 per cent and a maximum of 37.52 per cent with a mean of 17.89 per cent. The average capital ratio of the selected joint venture banks during the study period is 9.88 per cent, with a minimum value of 6.95 per cent and a maximum of 12.64 per cent. And, the NIM has a minimum value of 1.99 per cent and a maximum of 5.15 per cent with a mean of 3.51 per cent. Therefore, the maximum mean and minimum mean statistics of the sampled joint venture banks are bank size, from a minimum of 24.84 to a maximum of 26.75, leading to an average of 25.62, and net interest margin has a minimum and maximum mean statistic of the sampled banks is 1.99 per cent and 5.15 per cent, with a mean of 3.51 per cent.

Table 5. *Correlation of Government Banks*

		Leverage Ratio	Bank Size	Liquidity Ratio	Capital Ratio	Net Interest Margin
Leverage Ratio	Pearson Correlation	1	-.263	-.230	-.940**	-.170
BankSize	Pearson Correlation		1	-.106	.205	-.595*
LiquidityRatio	Pearson Correlation			1	.302	.453*
Capital Ratio	Pearson Correlation				1	.349
Net Interest Margin	Pearson Correlation					1

The Pearson Correlation Coefficient between the independent variable, Leverage Ratio, and the dependent variable is -.170. This implies that there is a negative correlation between the leverage ratio and with NIM of the government banks. NIM results in a lower leverage ratio. This can be concluded that NIM is negatively correlated with LE at a 1 per cent significant level, i.e. (r = = -.170, p=0.00 >0.01).

The Pearson Correlation Coefficient between the independent variable Bank Size and the dependent variable is -.595. This implies that there is a negative correlation with NIM of the government banks. It indicates that large NIM results in lower Bank Size. This can be concluded that NIM is negatively correlated with Bank Size at a 1 per cent significance level, i.e. (r = -.595, p=0.00 >0.01).

The Pearson Correlation Coefficient between the independent variable Liquid- ity Ratio and

the dependent variable NIM is .453. This implies that there is a positive correlation with NIM of the government banks. It indicates that large NIM results in a higher liquidity ratio. This can be concluded that NIM is positively correlated with liquidity ratio at a 1 per cent significance level, i.e. (r = .453, p=0.00<0.01).

The Pearson Correlation Coefficient between the independent variable, Capital Ratio, and the dependent variable is .349. This implies that there is a positive correlation between the Capital Ratio with NIM. It indicates that large NIM results in a higher Capital ratio. This can be concluded that NIM is positively correlated with CAP at a 1 per cent significance level, i.e. r = .349, p=0.00 <0.01, of the government bank.

Table 6. *Correlation of Joint Venture Banks*

		LeverageRatio	Bank Size	LiquidityRatio	Capital Ratio	Net Interest Margin
LeverageRatio	Pearson Correlation	1	-.693**	.214	-.988**	.256
BankSize	Pearson Correlation		1	-.496**	.704**	-.692**
LiquidityRatio	Pearson Correlation			1	-.223	.019
CapitalRatio	Pearson Correlation				1	-.246
Net Interest Margin	Pearson Correlation					1

The Pearson Correlation Coefficient between the independent variable, Leverage Ratio, and the dependent variable NIM is .256. This implies that there is a positive correlation between the Leverage Ratio and with NIM of the joint venture banks. It indicates that large NIM results in a higher leverage ratio. This can be concluded that NIM is positively correlated with LE at a 1 per cent significant level, i.e. (r = .256, p=0.00 <0.01).

The Pearson Correlation Coefficient between the independent variable Bank Size and the dependent variable NIM has remained -.692. This implies that there is a negative correlation between bank size with NIM of the joint venture banks. It indicates that large NIM results in lower Bank Size. This can be concluded that NIM is negatively correlated with Bank Size at a 1 per cent significant level, i.e. (r = -.692, p=0.00>0.01).

The Pearson Correlation Coefficient between the independent variable Liquidity Ratio and the dependent variable NIM is .019. This implies that there is a positive correlation between the liquidity ratio and with NIM of the joint venture banks. It indicates that large NIM results in a higher liquidity ratio. This can be concluded that NIM is positively correlated with liquidity ratio at a 1 per cent significant level, i.e. (r = .019, p=0.00<0.01).

The Pearson Correlation Coefficient between the independent variable Capital Ratio and the

dependent variable NIM is -.246. This implies that there is a negative correlation between the capital ratio a n d with NIM of the joint venture banks. It indicates that large NIM results in a lower capital ratio. This can be concluded that NIM has negatively correlated with capital ratio at a 1 per cent significance level, i.e. (r = -.246, p=0.00 >0.01).

Regression Analysis

The multivariate statistics principle, on which regression is based, calls for the simultaneous observation and examination of several statistical outcome variables. The method is applied in the design and analysis of trade studies in several dimensions, accounting for the impacts of each variable on the important responses. In statistics, the coefficient of determination, or R2, is used to describe statistical models whose main objective is the prediction of future outcomes based on other relevant data. The degree to which a regression line fits a set of data is indicated by its R2 value, which ordinarily varies from 0 to 1. If the R2 is close to 1, then a regression line fits the data well; if the R2 is close to 0, then the regression line does not fit the data well. Adjusted R2 is used to take into consideration the addition of new variables to the model. Adding extra independent variables expands the regression model. Unadjusted R2 will never go down, but it will nearly always climb. This will occur even if the extra components don't have a significant impact on the dependent variable's explanation. To compensate for this, adjusted R2 is connected with the number of independent variables in the model. The result is an adjusted R2, which varies based on whether the introduction of a new variable increases or decreases the model's ability to explain phenomena. Corrected R2 is always going to be less than unadjusted. The results of the analysis are presented in an ANOVA table. The column declarations in this table are "Source," "SS or Sum of Squares," "df" for degrees of freedom, "MS" for mean square, "F" for ratio of F, and "P, Probe, Probability, sig, or sig. of F." The t-test allows us to determine if a difference between two groups is "significant". A statistical technique called analysis of variance (ANOVA) is used to identify meaningful differences between means. "1%," "5%," and "10%" are frequently used to indicate significant quantities.

Table 7. Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Esti-mate
1	.856[a]	.734	.662	.0064131

a. Predictors: (Constant), Capital Ratio, Bank Size, Liquidity Ratio, Leverage Ratio

Source: Calculation using SPSS version 26 under Appendix I

R represents the multiple correlation coefficient, with a range that lies between -1 and +1. Based on Table 4.15, the R value has remained 0.856, which means net interest margin had a positive

relationship with leverage ratio, bank size, liquidity ratio and capital ratio. R-squared represents the coefficient of determination and ranges between 0 and 1. Since R R-squared value was 0.734, it means 73.4% of the variation in net interest margin is caused by leverage ratio, bank size, liquidity ratio and capital ratio of the government banks.

Table 8. ANOVA Test

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.002	4	.000	10.321	.000[b]
	Residual	.001	15	.000		
	Total	.002	20			

a. Dependent Variable: Net Interest Margin

b. Predictors: (Constant), Capital Ratio, Bank Size, Liquidity Ratio, Leverage Ratio

Source: Calculation using SPSS version 26 under Appendix I

The dependent variable net interest margin was regressed on the predicting variables of leverage ratio, bank size, liquidity ratio and capital ratio. The independent variables significantly predict net interest margin. F (4, 15) = 10.321, P<0.01, which indicates that the four factors under study have a significant impact on net interest margin.

Table 9. Multiple Regression Analysis (Gov. Bank, NIM)

Coefficients[a]

Model	Variable	Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.365	.106		3.426	.004
	Leverage Ratio	.004	.002	.896	2.219	.042
	Bank Size	-.016	.004	-.591	-4.194	.001
	Liquidity Ratio	.023	.015	.220	1.535	.091
	Capital Ratio	.405	.132	1.246	3.064	.008

a. Dependent Variable: Net Interest Margin

Source: Calculation using SPSS version 26 under Appendix I

Table 9 shows that the leverage ratio, bank size and capital ratio have a positive relationship with the dependent variable of the government bank. It indicates statistically significant, because the

p-value for this variable is lower than 0.05. This indicates that when the leverage ratio, bank size and capital ratio of the government banks increase, it results in to increase in the net interest margin of the banks. Liquidity Ratio has a negative relation with the dependent variable. It indicates statistically insignificant because the p-value for this variable is higher than 0.05. This indicates that when the liquidity ratio of the government banks increases, it results in to decrease in the net interest margin of the banks.

Table 10. Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Es-Estimate
1	.899[a]	.807	.777	.0034303

a. Predictors: (CConstant), Capital Ratio, Liquidity Ratio, Bank Size, Leverage Ratio

Source: Calculation using SPSS version 26 under Appendix I

R represents the multiple correlation coefficient, with a range that lies between -1 and +1. Based on Table 4.24, the R value has remained 0.899 for the joint venture banks. It means net interest margin had a positive relationship with leverage ratio, bank size, liquidity ratio and capital ratio. R-squared represents the coefficient of determination and ranges between 0 and 1. Since R R-squared value was .807, it means 80.7% of the variation in net interest margin was caused by leverage ratio, bank size, liquidity ratio and capital ratio of the joint venture banks.

Table 11. ANOVA Test

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.001	4	.000	26.199	.000[b]
	Residual	.000	25	.000		
	Total	.002	30			

a. Dependent Variable: Net Interest Margin

b. Predictors: (Constant), Capital Ratio, Liquidity Ratio, Bank Size, Leverage Ratio

Source: Calculation using SPSS version 26 under Appendix I

The dependent variable net interest margin was regressed on the predicting variables of leverage ratio, bank size, liquidity ratio and capital ratio. The independent variables significantly predict net interest margin, $F(4, 25) = 26.199$, $P<0.01$, which indicates that the four factors under study have a significant impact on the net interest margin of joint venture banks.

Table 12. Multiple Regression Analysis (JVB, NIM)

Coefficients[a]						
Model	Variable	Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.524	.070		7.461	.000
	Leverage Ratio	.002	.002	.522	.937	.058
	Bank Size	-.022	.002	-1.389	-9.794	.000
	Liquidity Ratio	-.041	.008	-.530	-5.124	.000
	Capital Ratio	.508	.254	1.130	1.998	.057

a. Dependent Variable: Net Interest Margin

Source: Calculation using SPSS version 26 under Appendix I

Table 12 shows that bank size and liquidity ratio have a positive relation with the Dependent variable of the joint venture bank. Because the researcher has found audited and unaudited data, but not published in some fiscal year of some sampled commercial banks. It indicates statistically significant, because the p-value for this variable is lower than 0.05. This indicates that when the bank size and liquidity ratio of the joint venture banks increase, it results in to increase in the net interest margin ofthe banks. Leverage Ratio and Capital Ratio have a negative relation with the dependent variable. It indicates statistically insignificant because the p-value for this variable is higher than 0.05. This indicates that when the leverage ratio and capital ratio of the joint venture banks increase, it results in to decrease in the net interest margin of the banks.

DISCUSSION

The result shows the Leverage Ratio has remained significantly negatively correlated with the NIM of government banks, which has remained dissimilar to the Leverage Ratio increases in the bank profitability of previous studies (Kiema & Jokivuolle, 2014; Grill et al., 2015). Bank Size has remained significantly negatively correlated with NIM of government banks. This indicates that it differs in some way. Because, former researcher explains that Bank Size enhances profitability (Regehr & Sengupta, 2016). In a similar study, the Liquidity Ratio has remained insignificant and positively correlated with the NIM of government banks (Sindhu et al., 2022). It means that it causes dissimilar with Lower predicted bankruptcy costs, reducing the cost of finance and risk exposures, allowing for greater money to support more revenue-generating firms, increasing profitability. The capital ratio continues to have a significant and favourable relation with the NIM of the government banks. It implies that the effects are similar to those of the former researchers (Barik & Raje, 2019; Bandyopadhyay, 2022).

In addition, the result shows Leverage Ratio has remained an insignificant positive correlation with NIM of joint venture banks, which is similar to Leverage Ratio increasing the bank

profitability of previous studies (Kiema & Jokivuolle, 2014; Grill et al., 2015). Bank Size has remained significantly negatively correlated with NIM of joint venture banks (Gupta & Mahakud, 2020). Because previous researchers explain that Bank Size enhances profitability (Sindhu et al., 2022). In a similar study, the Liquidity Ratio has remained significantly positively correlated with the NIM of joint venture banks (Sapkota, 2024). It means that it causes similar with Lower predicted bankruptcy costs, reducing the cost of finance and risk exposures, allowing for greater money to support more revenue-generating firms, increasing profitability (Youssef, 2024). The Capital Ratio continues to have an insignificant negative relation with the NIM of the joint venture banks. It implies that the effects are dissimilar to those of previous researchers. Capital structure and bank performance. According to previous researchers, a positive and statistically significant association was discovered between capital to asset ratio and bank profitability and stated that increasing the bank capital to asset ratio is beneficial for riskier banks in terms of reducing predicted bankruptcy costs and interest expenditures (Berrios, 2013; Abbas et al., 2019; Al-Sharkas & Al-Sharkas, 2022).

Implications

Although the study has long-term significance for Nepal's banking sector, it has three major limitations that should be addressed in follow-up investigations. To begin with, macroeconomic factors like GDP, inflation rate, and competitiveness were not considered in the study. Second, the study ignored unmeasured factors, including social conditions, political stability, and governmental control, in favour of measuring characteristics that could be measured. Moreover, by using other control variables like bank concentration, credit risk, and bankruptcy risk, the study can be further enhanced. As many Nepalese countries move from developing to developed economies, the study may soon be broadened to include the ideas of microfinance and financial inclusion to increase bank profit margins. This might have provided further details regarding the overall performance of banks. Finally, future research should concentrate on extending the study's time range and adding a few more financial variables in order to improve the reliability of the findings. The study concludes that bank managers seem to be conscious of interest expenses and, as a response, think about raising the bank capital ratio in order to reduce the demand from creditors for greater deposit returns in exchange for the expectation that shareholders will expropriate their claims. Commercial bank management should actively look for less expensive funding sources, such as consumer short-term financing with competitive interest rates, to increase their profitability.

The recent rise in short-term deposit mobilisation strategies and the nation's commercial banks' efforts to broaden their deposit base serve as evidence of this. In the meantime, bank management needs to make sure that overhead costs are minimised, because they adversely impact the profitability of the bank. Ultimately, the Bank of Nepal's bank capitalisation approach is accepted due to the positive correlation between performance and the capital-to-assets ratio.

CONCLUSION

This study aims to determine how much the capital structure impacts the banking sector's profitability. Leverage ratio and Bank Size have remained significantly negatively correlated with NIM of the government banks. It affects deposit and lending decrease, nonperforming loan increase, growth rate decrease, bonus dividend increase, and investment opportunity decrease. There is an insignificant positive correlation between the liquidity ratios with the NIM of the government banks. Where deposit and lending increase, non-performing loans decrease, reserve increases, growth rate increases, bonus dividend increases, investment opportunity increases, interest-earning assets decrease and net interest income increases. Capital Ratio has remained significantly positively correlated with NIM of the government banks. Which effects deposit and lending increase, nonperforming loans decrease, net interest income increase, reserve decrease, growth rate increase, bonus dividend increase, and investment opportunity increase in the government banks?

Leverage Ratio has remained insignificant positively correlated with NIM ofthe joint venture banks. Which effects deposit and lending increase, nonperforming loans decrease, reserve increase, bonus dividend decrease, investment opportunity increase, growth rate increase, and interest decrease. There is a significant negative correlation between bank size with NIM of the joint venture banks. Its effects on deposit decrease, lending decrease, nonperforming loan increase, reserve decrease, growth rate decrease, bonus dividend increase or constant, investment opportunity decrease, and interest increase. Liquidity Ratio has remained significantly positively correlated with NIM of the joint venture banks. Its impact on investment opportunities increases, net income increases, and interest decreases in the joint venture banks. Capital Ratio has remained insignificant negative correlation with NIM of the joint venture banks. Its impacts on deposit decrease, lending decrease, nonperforming loan increase, reserve decrease, growth rate decrease, bonus dividend increase or constant, investment opportunity decrease and interest increase of the joint venture banks. The outcome is affected by leading bank standards, tax laws, the CSER Committee's participation, and the presence of foreign directors. Despite the fact that the data on Bank Size, Liquidity, and Capital were a limitation for this study, we nonetheless advise that comparable analyses be performed for future studies that encompass all of the country's banks. This study has given us a framework for understanding the mix of leveraged finance used by Nepalese banks.

CONFLICT OF INTEREST

The author declared no conflict of interest.

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PROS AND CONS OF INTERNATIONAL BACCALAUREATE TEACHING AND LEARNING IN SCHOOL EDUCATION: A COLLABORATIVE AUTOETHNOGRAPHY ON LEARNING HOW TO LEARN

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ABSTRACT

Introduction: *Nepal's drive to improve quality, equity, and resilience in schooling intersects with a global search for pedagogies that move beyond rote learning. The International Baccalaureate (IB) offers inquiry-focused frameworks—the Primary Years Programme (PYP) and Middle Years Programme (MYP)—that emphasise concept-driven learning, the Learner Profile, and Approaches to Learning (ATL) skills designed to help students "learn how to learn."*

Methods: *Using collaborative autoethnography (CEA), I (IB MYP Year III student), in collaboration with my parents, generated and analysed two years of diaries, onsite observation notes, and family dialogues. Reflexive thematic analysis, member checks, and an audit trail supported trustworthiness.*

Results: *Six themes emerged. (1) Inquiry as identity and agency—voice/choice and transdisciplinary connections became routine in PYP/MYP classrooms. (2) Assessment and feedback cultures—criterion-related rubrics clarified expectations, but task "bunching" elevated stress. (3) Community and relationships—teacher rapport and the Learner Profile reframed feedback as character-building. (4) Access, resources, and equity—rich facilities and clubs supported learning, while affordability raised concerns. (5) Transitions and curricular continuity—shared ATL vocabulary eased school moves, yet local differences in planning and calendars mattered. (6) Wellbeing and self-management—competitive chess served as a laboratory for time management, metacognition, and emotion regulation, with perceived (but context-dependent) transfer to academics. These experiences map closely to IB's published aims for inquiry, ATL, and holistic growth. Findings converge with policy priorities in Nepal's School Education Sector Plan (SESP) 2022/23–2031/32, suggesting low-cost, scalable levers: coordinated assessment calendars; ATL-infused feedback routines across subjects; and transition toolkits for families moving between IB schools.*

Conclusion: *IB's strongest contributions in this context were inquiry-driven agency, transparent criteria, and shared skills language; constraints clustered around workload peaks, uneven implementation, and affordability. Practical cross-pollination—adapting ATL routines and assessment design principles beyond IB—can extend benefits to more learners while aligning with national reform goals.*

Keywords: *International Baccalaureate, Teaching, Learning, Education, Ethnography, Autoethnography, Collaborative Autoethnography, IB World School, IB Continuum School, Primary Years Programme (PYP), Middle Years Programme (MYP), Diploma Programme (DP), Nepal*

INTRODUCTION

Background

When my parents enrolled me in the International Baccalaureate (IB) Primary Years Programme (PYP) at the start of Grade 1 and reflected across time, my parents in Nepal—and most in the world—were wrestling with an uncomfortable truth: schooling and education are not the same thing (Shujaa, 1993; Aronowitz, 2015). International evidence described a "learning crisis," with far too many children attending school but failing to gain foundational literacy, numeracy, and social–emotional skills (Whitted, 2011; Wolf & McCoy, 2019; Oketch, 2021; Clarke, 2022; Garg, 2024). In low- and middle-income countries, learning poverty—the share of 10-year-olds unable to read and understand a simple text—rose to more than 50 to 70 per cent in the wake of COVID-19 (Azevedo, 2021; Gandhi et al., 2021; Afkar et al., 2023), underscoring deep structural weaknesses in traditional, exam-centric systems.

In South Asia and Nepal, these global patterns intersect with local realities. Nepal's School Education Sector Plan (SESP) 2022/23–2031/32 explicitly prioritises quality, equity, and resilience, acknowledging persistent gaps in foundational learning, uneven instructional quality, and resource constraints that limit opportunities for many learners (GoN, 2022). The plan argues for teaching that moves beyond rote memorisation toward active, student-centred pedagogies and better assessment practices—so that more children learn well, not just attend school.

These concerns echo long-standing critiques of "traditional education," often described as teacher-dominated, textbook-driven, and examination-oriented (Grant et al., 2014; Harrell, 2019). In contrast, progressive education—rooted in the work of philosopher John Dewey (1938)—holds that learning is social, experiential, and reflective, and that curriculum should connect to real problems in children's lives (Rodgers, 2002; Howlett, 2013; Kolb, 2014; Tippet & Lee, 2019). Dewey cautioned that neither "old" nor "new" models are sufficient on their own; what matters is a thoughtful design that links experience to disciplined inquiry (Rodgers, 2002; Johnston, 2006; Nelsen, 2015; Dixon, 2020). This theoretical lineage helps explain why many families, including mine, seek approaches that develop both knowledge and habits of mind.

In Nepal, the International Baccalaureate (IB) Primary Years Program (PYP) was first authorised at Premier International School on 15 December 2014, followed by Genius School on 23 September 2018. Within this landscape, my parents chose the International Baccalaureate (IB) PYP in Genius School because it offered a coherent, progressive model that felt both principled and practical, as also noted by other IB PYP researchers (Drake et al., 2015; Zeng, 2024). The PYP foregrounds concept-driven inquiry, transdisciplinary learning, and a community culture shaped by the IB Learner Profile—ten attributes (for example, Inquirer, Caring, Principled, Reflective) that point beyond test scores to the kind of person a learner becomes (Shreelakshmi, 2022; Zeng, 2024). The PYP is built around three pillars—the learner, learning and teaching, and the learning community—and uses a collaboratively designed programme of inquiry to connect big ideas across subjects (Drake et al., 2015; Medwell et al., 2017; Gurkan, 2021). For my family,

that meant a daily experience of voice and choice, clear purposes for tasks, and feedback that built confidence as well as competence.

As I progressed into the Middle Years Programme (MYP) at Swostishree Gurukul IB World School, the Approaches to Learning (ATL) skill framework (thinking, communication, social, self-management, research) and criterion-related assessment (Guide, 2008; Ramli et al., 2021) provided language and structure for self-regulated learning. These features aligned with the way I was also growing as a competitive chess player (FIDE, 2025): planning, managing time, reflecting after each game, and transferring those habits back into schoolwork. My parents noticed that the IB emphasis on inquiry and feedback addressed precisely what they worried about in traditional models—limited agency, memorisation without meaning, and high-stakes exams as the only mirror for learning.

Statement of the problem and rationale

Despite policy intentions and school reforms, many learners in Nepal still experience a mismatch between the promise of education and the day-to-day realities of teaching and assessment (Andersson & Lindkvist, 2000; Valentin, 2006; Subedi, 2018; Lal, 2025). Families make schooling decisions within this tension, often with limited, experience-based evidence about how specific pedagogical models (such as the IB continuum) actually shape learning, identity, wellbeing, and family life. This creates a need for research that is both rigorous and personal—documenting lived practice rather than only policy and programme claims of the school education sector plan (GoN, 2022; MOEST, 2025).

Purpose of this study

This article uses collaborative autoethnography (Chang et al., 2016) —a qualitative approach that brings together the voice of a student (author) based on my own experience and reflections from my parents—to explore the pros and cons of the International Baccalaureate (IB) teaching and learning for school education in Nepal. Specifically, this study aims to: (a) narrate and analyze my experience moving from PYP into MYP (b) examine how inquiry, criterion-related assessment, and Approaches to Learning (ATL) operate in everyday practice, (c) consider interactions between school learning and co-curricular development (for example, competitive chess), and (d) reflect on implications for Nepal's reform priorities around quality and equity. By situating an individual story within global, regional, and national debates about the aims of education, we hope to offer evidence that is at once human, situated, and useful to educators, parents, and policymakers.

METHODS

Design

This study adopts a collaborative autoethnography (CAE) (Chang et al., 2016) —a qualitative design that is simultaneously autobiographical and ethnographic while leveraging joint meaning-making among collaborators (here, the author and parents). CAE provides practical procedures for shared data-gathering, dialogic analysis, and negotiated writing (Roe & Uekusha, 2020).

Participants and context

The focal participant is a Grade 8 (MYP Year III) student enrolled at an IB World School in Kathmandu. School contexts include: Genius School (IB authorised for PYP & MYP),

Machhapuchchhre School (IB authorised for PYP), and Swostishree Gurukul (IB School offering PYP, MYP & DP).

Data collection

The researcher used three complementary sources across two academic years and retrospective memory work: (1) Personal learning diary (student): weekly entries about tasks, feedback, ATL strategies, and emotions; (2) Onsite field notes (parents): observations during exhibitions/PTMs, homework routines, assessment briefings, school visits, and correspondences; (3) Collaborative dialogues (family): records and debriefs after units/assessments and after chess tournaments, then member-checked summaries.

Scientific justification

IB's MYP emphasises concept-driven, criterion-related assessment and ATL skill development; the design foregrounds lived practice over program claims by examining how such features are enacted in daily study and family life. CAE is suitable for connecting the student's micro-experiences to broader cultural scripts of schooling in Nepal (Dahal & Luitel, 2022; 2023)

Data analysis and trustworthiness

We conducted reflexive thematic analysis following Braun & Clarke's six phases (familiarisation, coding, theme development, review, definition, reporting) (Braun & Clarke, 2006), iteratively moving between student and parent vantage points and anchoring interpretations with verbatim narrative vignettes. Trustworthiness was pursued via prolonged engagement with the data, triangulation of sources, member checks, and an audit trail, guided by Lincoln & Guba's criteria—credibility, transferability, dependability, and confirmability (Lincoln & Guba, 1982; Carcary, 2009; Anney, 2014; Amankwaa, 2016; Amin et al., 2020; Ahmed, 2024).

Ethics

All reflections are presented with family consent. School names appear as part of contextual description; evaluative judgments are clearly framed as subjective experiences.

RESULTS

The analysis resulted in the construction of six interdependent themes (with sub-themes). Analytical commentary is accompanied by italicised, indented vignettes capturing the participant voice in situ.

Theme 1: Inquiry as identity and agency

Inquiry practices in PYP/MYP supported ownership, with student-led questioning and product choices. Connecting concepts across subjects (e.g., energy in science, sustainability in I&S) mirrored the IB's transdisciplinary and concept-based design. For me, chess functioned as a parallel "inquiry laboratory," strengthening my planning and evaluation habits akin to ATL thinking skills while coming to MYP. This resulted in voice and choice in tasks, transdisciplinary connections, and chess as an inquiry habit.

> *"When the unit began with a statement of inquiry, I felt I was not just receiving facts but building a map. In chess, I visualise lines; in class, I visualise concept links. That felt empowering."*

Theme 2: Assessment and feedback cultures

MYP's criterion-related rubrics clarified expectations and supported self-assessment, yet cumulative deadlines sometimes spiked stress, especially during interdisciplinary tasks and personal-project style work. I learned to parse descriptors (Achievement Level 1–8) and to plan drafts accordingly. I not only got criterion clarity and feedback literacy, but also the writing workload and emotional load.

> *"Rubrics turned the mystery into steps. But when multiple subjects scheduled big tasks in one week, the 'criteria' felt like a mountain of tiny footholds I had to climb fast. Writing neatly and cleanly with a good pace was always a challenge for me."*

Theme 3: Community and relationships

Regular conferences and unit briefings enhanced transparency; group tasks built collaboration skills but required scaffolding for equitable participation. The learner profile discourse (caring, principled, open-minded) shaped classroom norms when consistently modelled. We fostered teacher–student rapport, parent–school communication, and peer collaboration.

> *"When my teacher referenced me as 'Principled' and 'Communicator' during feedback, it felt like the handwriting mattered less than the kind of person I was practising to achieve."*

Theme 4: Access, resources, and equity

Resource-rich settings in supported labs, design, and clubs; however, IB affordability remains a concern for many families in Nepal. Situating IB within national reform highlights opportunities to align ATL/inquiry practices with drives for quality and resilience post-pandemic. The dissonance and discussions around fees and facilities, money and materials, manual skills and technology, power and justice, and issues of inclusion were prominent in IB schools' matters in the context of Nepal.

> *"I loved extra-curricular activities (ECA) and co-curricular activities (CCA) options and design lab. During MYP, I appreciate that both schools introduced chess after I joined, as a matter of acknowledgement, recognition and motivation. I knew not every friend outside IB schools gets this. I wondered how the schools in Nepal could make 'learning how to learn' available for more students as a matter of fairness, equity and justice."*

Theme 5: Transitions and curricular continuity

Shifts between schools brought subtle differences in unit planning and assessment language, despite shared IB frameworks—illustrating how local interpretation affects student experience. The common ATL vocabulary eased re-entry. While moving across IB schools, consideration of aligning task calendars and terminology drift can help in a smooth transition.

> *"Changing schools felt like switching openings in chess—same pieces, different plans. Knowing ATL terms helped me settle faster."*

Theme 6: Wellbeing and self-management (chess as a case)

Tournament preparation and FIDE-rated play cultivated routines for goal-setting, reflection, and emotional regulation. Evidence on chess-to-school transfer is mixed, but I experienced benefits in focus and planning and also won various tournaments under 12 years while building these habits.

Time management, metacognition, and bounded transfer are crucial in learning.

> *"Before an under-12 event, I rehearsed tactics, then practised a 'what if' list for science too. I don't know if chess raises grades, but it taught me how to breathe during pressure and to think in plans, not panic."*

Autoethnographic reflections as a student of the IB education system

Reflections on Genius IB World School

> *"Inquiry time felt like play with purpose—building, asking, showing. Reading became my habit as teachers sent a new book for me to read almost every day. The first time I heard 'Inquirer' and 'Caring' on the wall, I believed school could be about the kind of person I am becoming, as my teachers said my nature matched the name of the school."*

Reflections on Machhapuchchhre IB World School

> *"Criteria were new muscles for the body of learning. I learned to read tasks like positions in chess—evaluate, plan, review. Group work was powerful when roles were clear, but hard when effort wasn't balanced, especially on the assignment of a chunk of written homework."*

Reflections on Swostishree Gurukul IB World School

> *"Teachers coached ATL explicitly. The language of feedback ('explain, justify, evaluate') echoed across subjects. I started keeping a feedback journal alongside my chess books and notebook. I learned to review books, articles and write review articles and published my first article in a scientific research journal."*

> *"I love that the school runs only five days a week. I love the warm swimming pool at the school during winter. I feel honoured that many students expressed their interest in the chess club led by me, and the school installed a big chessboard in the school premises with life-size chess pieces. We are still advocating to get a coach."*

Autoethnographic reflections as parents of the IB education system

Reflections on Genius IB World School

> *"The PYP exhibition culture introduced us to inquiry and agency early. Communication was frequent, individual care for the child was significant, and we valued the emphasis on dispositions. We had to change the school carefully due to the Covid-19 pandemic, the location shifting plan of the school towards a long distance and our aim to promote/skip the grade of our child."*

Reflections on Machhapuchchhre IB World School

> *"Transitioning into MYP brought rubric literacy for us, too. We appreciated the transparency of the criteria, but felt calendar bunching at times. The school's effort on academic improvement was encouraging, while that for the IB journey seemed to be evolving. The support that the school offered to our child was admirable. We had to change the school due to no immediate planning for the school to get accredited to IB MYP, and our willingness to admit our child to a nearby IB MYP-accredited school."*

Reflections on Swostishree Gurukul IB World School

> *"ATL coaching and interdisciplinary connections stood out. The school's established IB systems helped, though we still advocated for workload balancing around tournaments and school breaks. The school is responsive to the voices of children and parents. We are privileged to have an accredited IB continuum school in our municipality and are happy to collaborate in the school's effort to create a child-friendly and healthy school environment."*

DISCUSSION

To orient the reader, we note that the six themes distilled in the Results—inquiry and agency; assessment and feedback; community and relationships; access and equity; transitions and curricular continuity; and wellbeing/self-management (with chess as a case)—are the analytic through-lines that this Discussion revisits and situates against established frameworks and policies. Each theme is grounded in the student and parent vignettes yet also maps onto core features of the International Baccalaureate design (for example, inquiry-driven learning, criterion-related assessment, and Approaches to Learning skills), which provides a coherent lens for interpreting gains in voice, clarity, and metacognition reported in the data. At the same time, the equity and transition tensions we surfaced resonate with Nepal's School Education Sector Plan (2022/23–2031/32) emphasis on quality, equity, and resilience, allowing us to read family-level experiences alongside national priorities. In the pages that follow, we therefore move iteratively between the lived evidence and these reference points to explain where our findings converge with, extend, or complicate the existing literature and policy intentions.

1. Inquiry, agency, and learning: aligning lived experience with evidence

My finding that inquiry practices cultivated ownership, voice, and transdisciplinary thinking is consistent with progressive education traditions that frame learning as experiential, social, and reflective (Dewey, 1938; Rodgers, 2002; Howlett, 2013; Kolb, 2014; Tippett & Lee, 2019). In the **International Baccalaureate (IB) Primary Years Programme (PYP)** and **Middle Years Programme (MYP),** this ethos is operationalised through concept-driven units, a collaboratively designed programme of inquiry, and explicit emphasis on learner dispositions, all of which my narratives illustrate (Drake et al., 2015; Medwell et al., 2017; Gurkan, 2021; Shreelakshmi, 2022; Zeng, 2024). The sense of "building a map" of ideas, and transferring habits from chess to classwork, coheres with the **Approaches to Learning (ATL)** framework that names thinking, research, communication, social, and self-management as core, teachable skills (Ramli et al., 2021).

2. Assessment and feedback: clarity with pressure points

I experienced **criterion-related assessment** as clarifying and growth-oriented—students can locate themselves on descriptors and plan drafts toward higher achievement levels—while also noting workload peaks when tasks cluster (Guide, 2008; Ramli et al., 2021). This dual reality fits my results: rubrics and best-fit judgements enhanced feedback literacy, yet **calendar bunching** produced stress, especially for extended writing. The handwriting challenge I describe further shows how product demands can become hidden barriers even in transparent systems; schools, therefore, need to align scheduling and modalities with the intent of fair, meaningful assessment (Guide, 2008).

3. Community, relationships, and the Learner Profile

Teacher–student rapport and the **IB Learner Profile** reframed feedback as character-forming practice—"Communicator," "Principled," and "Caring" were not posters but shared language enacted in conferences and comments. This mirrors research and practitioner accounts that the learner profile can humanise assessment and cultivate an ethical classroom culture when consistently modelled (Shreelakshmi, 2022; Zeng, 2024; Drake et al., 2015).

4. Access, resources, and equity in Nepal's policy moment

My reflections on facilities (for example, design labs, clubs) and affordability resonate with **equity** concerns in Nepal's sector plan. The **School Education Sector Plan (SESP) 2022/23–2031/32** urges a shift from rote learning toward active pedagogy and better assessment while targeting quality, equity, and resilience (GoN, 2022). My data suggest that ATL routines (goal-setting, reflection, peer feedback) and inquiry design principles developed in IB contexts could inform wider system improvement without requiring full programme adoption—an especially relevant point as the Ministry of Education, Science and Technology pursues quality-focused reforms (MOEST, 2025).

5. Transitions and curricular continuity across IB schools

Moving between IB schools, I encountered **local variation** in unit planning, timing, and terminology despite a shared framework. My experience supports practical alignment mechanisms—shared calendars, common rubric language workshops, and transition briefings—to smooth learner mobility within Nepal's IB ecosystem (Guide, 2008). Importantly, the common ATL vocabulary eased re-entry, highlighting the value of a stable skills language across sites (Ramli et al., 2021).

6. Wellbeing and self-management: the chess case

The chess narrative shows how co-curricular pursuits can function as laboratories for **time management, metacognition, and emotion regulation**. My tournament preparation, reflection habits, and under-12 successes illustrate personally meaningful gains and demonstrate how ATL routines can travel between domains. While broader claims about academic transfer remain debated, chess provided a concrete context for practising planning, focus, and review—skills also central to MYP learning cycles (FIDE, 2025; Ramli et al., 2021).

7. Implications for Nepal: from classroom routines to system learning

My results point to three practical levers for the reform agenda:

1. **Assessment by design:** cross-subject scheduling protocols to prevent task clustering while preserving rigorous criteria (Guide, 2008).
2. **ATL for all:** low-cost professional learning communities to adapt ATL routines (journals, success criteria, peer conferences) beyond IB schools (GoN, 2022; MOEST, 2025; Ramli et al., 2021).
3. **Transition toolkits:** PSP-aligned checklists (shared rubrics, glossary, orientation to expectations) to reduce friction when families move across schools (Guide, 2008).

8. Methodological value and limits of collaborative autoethnography

Collaborative autoethnography (CAE) enabled triangulation between a student's voice and parents' observations, dialogic sense-making, and negotiated text (Chang et al., 2016; Roe & Uekusha, 2020). My **reflexive thematic analysis** followed established phases (familiarisation, coding, theme development, review, definition, reporting) and addressed **trustworthiness** through prolonged engagement, triangulation, member checks, and an audit trail (Braun & Clarke, 2006; Lincoln & Guba, 1982; Carcary, 2009; Anney, 2014; Amankwaa, 2016; Amin et al., 2020; Ahmed, 2024; Dahal & Luitel, 2022, 2023). Limitations include the **single-family** scope and potential role reactivity (student–author; parent–observer), though my procedures mitigate these risks (Lincoln & Guba, 1982; Carcary, 2009; Amankwaa, 2016; Amin et al., 2020; Ahmed, 2024).

CONCLUSION

Across three International Baccalaureate (IB) settings in Nepal, this collaborative autoethnography found that the strengths of IB lie in inquiry-driven agency, transparent, criterion-related assessment, and Approaches to Learning (ATL) routines that support self-regulated learning and a values-rich classroom culture. The constraints I experienced—workload peaks from task clustering, uneven implementation across schools, and affordability—align with wider concerns in Nepal's reform agenda around quality and equity. The chess case shows how co-curricular contexts can powerfully rehearse ATL behaviours such as planning, reflection, and emotional regulation, even as broader academic transfer remains context-dependent.

For policymakers and schools, practical next steps include coordinated assessment calendars, ATL-focused professional learning for all teachers (inside and outside IB schools), and transition toolkits to reduce friction when students move between IB sites. These moves can extend the pedagogical dividends of clarity, agency, and metacognition to more learners across Nepal—regardless of programme label—while staying faithful to the human realities your narratives foreground.

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CONFLICT OF INTEREST

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EFFECTS OF REMITTANCE ON FINANCIAL SAVINGS IN NEPAL: AN EXPLORATION THROUGH AUTO-REGRESSIVE DISTRIBUTED LAG APPROACH

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ABSTRACT

Foreign remittances have emerged as a significant source of external finance for many developing countries, and Nepal is no exception. The family members and the government of the country of origin derive the maximum possible advantages of remittances in various fields, and it is becoming a more stable source of external finance. It is used in multiple sectors, including financial savings in Nepal. Despite the increasing importance of remittances in the Nepalese economy, the relationship between remittances and financial savings has not been adequately studied yet. Hence, the prime objective of this paper is to analyse the effects of remittances on the financial savings in Nepal. The Auto-Regressive Distributed Lag (ARDL) Bounds Testing Model is employed in this study to identify the effects of remittances on financial savings in Nepal. The time series data for 24 years, spanning 2001-2024, are collected from various published sources of the Nepal government, such as the Ministry of Finance (MOF), Nepal Rastra Bank (NRB) and National Statistics Office (NSO). This study has identified a positive and significant relationship between remittances and financial savings in Nepal. The impacts of other control variables, NBF, are negative and significant. The Nepal government and other concerned agencies should encourage migrants to send remittances only from formal banking channels, encouraging them to save, which helps capital formation, investment and job creation in Nepal. It also solves the liquidity crisis and foreign exchange constraints in the nation.

Keywords: *Remittance, Financial Savings, Time series, ARDL Bound Testing, Long-Run*

INTRODUCTION

Background

Foreign remittances have emerged as a significant source of external finance for many developing countries, and Nepal is no exception (Lamsal, 2024). Over the past decades, Nepal has witnessed a remarkable rise in remittance inflows, driven by the increasing number of its labour force working abroad, particularly in the Gulf countries, Malaysia, and India (Lamsal, 2023). These inflows have become an essential pillar of the national economy, contributing significantly to GDP, improving household incomes, and reducing poverty (MOLESS, 2020). The role of remittances extends beyond consumption support—they also influence investment behaviours, including the patterns and levels of financial savings (Siddiqui, Haider & Hossain, 2016).

Remittance has become a major source of external finance for developing countries like Nepal. Many research works have been done by domestic and international researchers to explore the effects of remittances on economic growth, investment, poverty, health and education and so on. However, there is a dearth of literature on the impact of remittance on financial savings (Lamsal, 2024). In this context, my study focuses on the effects of remittance on financial savings in commercial banks in Nepal.

Financial savings play a vital role in capital formation and economic development by mobilising domestic resources for productive investment (Lamsal, 2023). In theory, remittances have the potential to boost savings by increasing disposable household income (Lawel et al., 2016). However, the actual impact of remittances on savings in Nepal remains a topic of ongoing debate. While some studies suggest that remittance-receiving households tend to save more, others argue that remittances are often used primarily for consumption, debt repayment, or non-productive expenditures such as real estate and social ceremonies, which may not translate into formal financial savings (Jongwanich, 2007; Aslam & Sivarajasingham, 2020).

Economic liberalisation and globalisation have increased the movement of workers around the world market, especially after the 1970s. This has encouraged workers to migrate from low-income and underdeveloped countries to the developed, industrialised, and emerging economies in search of employment and other opportunities (Shrestha, 2004). This policy has also influenced the movement of Nepalese workers abroad, basically since the 1990s. Nepalese are migrating abroad every year in search of employment opportunities due to economic and non-economic reasons. Mostly, the remittances income received is used for consumption purposes, which has very little impact on long-term growth in the economy (Yousafzai, 2015).

There are four types of banks and financial institutions which carry the financial transactions in Nepal. They are called A class (Commercial Banks), B class (Development Banks), C class (Finance Company) and D class Banks (Microfinance Financial Institutions). By the end of June 2024, there are 20 Commercial banks, 17 Development Banks, 17 Finance Companies and 52 Microfinance Financial Institutions in Nepal (NRB, 2024). However, our study focuses on financial savings only in commercial banks.

Remittance plays a crucial role in enhancing financial savings in many ways. Firstly, it should be clear that remittances are sent in Nepal from formal and informal channels. The majority of remittances are sent through banking channels, which is the formal channel. As remittances are transferred through the banking sector, it increases the savings rate in the economy. When remittances are sent to Nepal, remittances increase the possibility of having an account in the banks. Studies conducted by Aslam and Sivarajasingham (2020) found that remittance-receiving households demand, i.e., open more bank accounts, which in turn, contribute to financial savings and demand for loans as well.

Financial savings in commercial banks are affected by multiple factors. The amount of GDP of a nation is one of the prime determinants. Likewise, the rate of interest offered by commercial banks to their customers on savings and fixed accounts is another factor affecting savings in the economy (Mamum & Kabir, 2023; Snyder & Wen, 2016; Quisumbing & McNiven, 2007). Other things being the same, the higher the rate of interest offered by commercial banks in savings, the more will be the savings in the economy, and vice versa. Over the last few decades, remittances

sent by Nepalese migrants have become another major factor determining the savings in the financial institutions. Even though remittance is used for multiple purposes, it is also used for saving by the recipients.

This research article aims to explore and analyse the effects of foreign remittances on financial savings in Nepal by examining household-level behaviour, savings patterns, and the role of financial institutions in facilitating savings. Understanding this relationship is critical for policymakers to design appropriate financial instruments and policies that channel remittance income into productive savings and investments. The study will also shed light on the broader implications of remittance-driven savings for sustainable economic growth and financial inclusion in Nepal.

Research Objectives

The research question and main problem to be addressed are, "How does remittance sent by Nepalese workers from host countries affect the financial savings in Nepal?" Thus, the objective of this study is to explore the effects of remittances on financial savings in Nepal. As the main variable of interest of the study is remittance, it is expected that remittance inflow boosts household savings. Besides, the specific objectives are to identify the effects of remittances, the rate of interest and the number of banks on financial savings in Nepal.

REVIEW OF LITERATURE

Most of the previous studies have found positive effects of remittance on the saving behaviour of recipient households. In this context, a study was conducted by Baldé (2011) to find the impact of remittances and foreign aid on savings/investment in Sub□Saharan Africa. The author used 34 Sub-Saharan African (SSA) nations spanning from 1980 to 2004, and the OLS method was employed for empirical findings. This study concluded that remittance has positive impacts on financial savings in SSA nations. Similarly, Munir, Sial, Sarwar and Shaheen (2011) also found a positive effect of workers' remittances on private Savings behaviour in Pakistan.

Kokorović Jukan, Okičić and Hopić (2020) analysed the impact of remittances on savings and financial inclusion of youth in South East Europe by collecting the primary data for financial inclusion. The study used the Probit regression model for empirical analysis and found a positive effect of remittance on financial savings.

Přívara and Trnovský (2021) analysed the impacts of remittances on households' savings in the Baltics by using time series data from 2010 to 2017. The study used the OLS method for empirical findings and says that the inflow of foreign remittance promotes households' savings in the Baltics.

By using the Vietnam household living standard survey data of 2012, Hua, Kessels, and Erreygers (2022) analysed the impact of remittances on saving behaviour and expenditure patterns in Vietnam. The study used the Propensity score matching technique for empirical findings. The study argued that remittance inflow has positive impacts on savings.

Salahuddin, Masud and Kian Teng (2022) explored the effects of remittances on households' savings behaviour in Bangladesh by using the Bangladesh Bureau of Statistics data for the year 2016. The study employed the OLS method for empirical results and concluded that remittance inflow encourages the saving habits of households.

A study conducted by Osei-Gyebi, Opoku, Lipede, and Kemmoe Kountchou (2023) tried to explore the effect of remittance inflow on savings in Nigeria. They used the World Bank's survey data on 3000 Nigerian people and used the Logit model for empirical findings. The study concluded that individuals who have bank accounts save more than those who do not have one.

Baafi and Kwame Asiedu (2025) explored the synergistic effects of remittances, savings, education and digital financial technology on economic growth in Sub-Saharan Africa by using time series data for 23 SSA nations, from 1974 to 2020. By employing the GMM model, the study found positive effects of remittance on financial savings. Hence, most of the previous studies have found positive effects of remittance on households' savings. However, what would be its effect on the Nepalese economy is the main concern of this study.

METHODS

Data Sources and Variables

This study explores the impact of remittances on financial savings in Nepal by using secondary data. It uses the yearly time series data set from the year 2001 to 2024, i.e., an extended set of data for 24 years, published by the Ministry of Finance (MOF) in the Economic Survey of various issues, data published in the quarterly economic bulletin by Nepal Rastra Bank (NRB), and publications of the National Statistics Office (NSO). The major variable of interest in this study is remittances. Besides remittances, other control variables used in this study are the number of banks and financial institutions and the rate of interest. Among the methods used for analysing the time series data, ARDL is suitable for both small and large size of sample sizes. Thus, the ARDL Bounds testing model is selected for the empirical analysis. Unit root for a stationary series is checked by using the ADF Unit Root test. Empirical results are obtained by using EViews 10 software.

Model Specification

To test whether remittances enhance domestic saving through their effect on the financial savings made in the banking sector of Nepal, the following equation is used:

$$FINSt = f(REMIt, NBFt, Rt) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

Where,

FINS = financial savings in commercial banks' accounts;

REMI = remittance inflow in Nepal;

NBF = Number of banks and financial institutions in Nepal, and

R = Rate of interest charged by commercial banks on deposits.

The linear form of the regression equation for the financial saving function is

$$FINS_t = \lambda_0 + \lambda_1 REMIt + \lambda_2 NBF_t + \lambda_3 Rt + v_t \quad \ldots\ldots\ldots \quad (2)$$

Equation (2) can be written in double-log form as follows:

$$LnFINS_t = \lambda_0 + \lambda_1 LnREMIt + \lambda_2 LnNBF_t + \lambda_3 LnRt\ v_t \quad \ldots\ldots\ldots\ldots \quad (3)$$

Auto Regressive Distributed Lag (ARDL) Model Estimation

Our study employs the bound test to identify the cointegration among the model's selected variables. To identify the cointegration among the selected variables as stated in equation (3), the ARDL framework is given below.

$$\Delta \text{ Ln FINSt} = \beta_0 + \sum_{i=1}^{p} \beta_{1i} \Delta \text{ Ln FINS}_{t-i} + \sum_{i=1}^{q} \beta_{2i} \Delta \text{ Ln REMI}_{t-i} + \sum_{i=1}^{q} \beta_{3i} \Delta \text{ Ln NBF}_{t-i} + \sum_{i=1}^{q} \beta_{4i} \Delta \text{ Ln R}_{t-i} + \beta_{11} \text{ Ln FINS}_{t-1} + \beta_{12} \text{ LnREMI}_{t-1} + \beta_{13} \text{ Ln NBF}_{t-1} + \beta_{14} \text{ Ln R}_{t-1} + \varepsilon_{1t.} \quad \ldots\ldots\ldots\ldots\ldots\ldots (4)$$

And the corresponding Error Correction Model (ECM) is given as:

$$\Delta \text{ Ln FINSt} = \beta_0 + \sum_{i=1}^{p} \beta_{1i} \Delta \text{ Ln FINS}_{t-i} + \sum_{i=1}^{q} \beta_{2i} \Delta \text{ Ln REMI}_{t-i} + \sum_{i=1}^{q} \beta_{3i} \Delta \text{ Ln NBF}_{t-i} + \sum_{i=1}^{q} \beta_{4i} \Delta \text{ Ln R}_{t-i} + \alpha \text{ ETC}_{t-1} + \varepsilon_{1t.} \quad \ldots\ldots\ldots (5)$$

Where,

$\beta_{1i,}$ β_{2i}, and β_{3i} = short-run coefficients of the model's adjustments in the long-run equilibrium,

$\beta_{11,}$ β_{12}, and β_{13} = long-run coefficients

α = Speed of adjustment parameter with a negative sign, and ECT = Error correction term.

Unit Root Test

The most popular unit root test is given by Dickey–Fuller, popularly by the name of Augmented Dickey–Fuller (ADF) test, given by the following equation (Dahal, 2013; Lamsal, 2024).

$$\Delta Y_t = \alpha + \beta_t + \lambda Y_{t-1} + \delta_1 \Delta Y_{t-1} + \ldots\ldots\ldots + \delta_p \Delta Y_{t-p} + \varepsilon_t \quad \ldots\ldots\ldots\ldots\ldots\ldots (6)$$

Where, Y = time series variable, α = constant, β = coefficient on a time trend(t), p = Lag order of the autoregressive process and εt = pure white noise error term.

While calculating the ADF unit root, the null hypothesis (H_0) is tested against the alternative hypothesis (H_1) as follows:

Null Hypothesis (H0): Variables are not stationary, i.e., they have a unit root

Alternative Hypothesis (H1): Variables are stationary, i.e., they have no unit root

In this model, rejection of the null hypothesis implies the variables are stationary.

RESULTS

Descriptive Statistics

The summary statistics of selected variables for this study are given in Table 1.

Table 2: Descriptive Statistics

	LNFINS	LNREMI	LNNBF	LNR
Mean	5.296014	11.77697	5.237317	7.234587
Median	5.183717	11.92041	5.262839	4.986754
Maximum	6.371264	12.47415	5.620217	7.653423

Minimum	4.590575	10.74011	4.605170	5.555432
Std. Dev.	0.563433	0.645356	0.299502	0.453423
Skewness	0.450905	-0.470840	-0.541277	-0.345432
Kurtosis	1.953128	1.643739	2.225444	1.234321
Jarque-Bera	1.750103	2.499021	1.624206	1.887765
Probability	0.416841	0.286645	0.443924	0.398765
Sum	116.5123	259.0934	115.2210	118.0987
Sum Sq. Dev.	6.666596	8.746183	1.883731	4.987456
Observations	24	24	24	24

Source: Calculated by Using EViews 10

Unit Root Test Results

Table 2: Result of ADF Test for Unit Root

Variables	Model	Level: I (0)		First Difference I (1)	
		t-stat	p-value	t-stat	p-value
LnFINS	Trend & Int	-1.3414	0.8481	-4.9890	0.0046
LnREMI	Trend & Int	0.1447	0.9952	-3.6571	0.0515
LnNBF	Trend & Int	0.0157	0.6760	-2.5958	0.0123
LnR	Trend & Int	-2.2341	0.5433	-3.4569	0.0252

Source: Calculated by Using EViews 10.

Table 2 shows that all the variables used in this model are stationary at first difference, and none of them are stationary at second difference. Thus, it is fit for the use of the ARDL model.

Lag Length Selection

To estimate the ARDL model, for Bounds Testing and Long Forms, and for Error Correction models, lag length is required (Pesaran & Shin, 1999; Mamun & Kabir, 2023). The most popular Lag operators used by researchers include: FPE, AIC, SC, and HQ. The optimal Lag length is that which has the lowest values as calculated by each method (Pesaran & Shin, 1999; Pesaran, Shin, & Smith, 2001). The calculation of the appropriate Lag length for this study is presented in Table 3 on the basis of the AIC criteria.

Table 3: Lag length Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	70.35902	NA	2.43e-09	-8.484339	-8.286478	-8.457056
1	170.4024	130.8404*	4.32e-13*	-16.15583*	-14.16651*	-18.01943*
2	180.4223	8.019642	1.34e-12	-14.38022	-12.59955	-15.13470

*= Optimum Lag Length

Criteria calculated by the Author Using EViews 10.

ARDL Model Estimation

The Auto Regressive Distributed Lag model (ARDL: 1, 0, 0, 0) is chosen based on AIC criteria. Table 4 shows the empirical findings of the ARDL model.

Table 4: Empirical Results of the ARDL Model

Dependent Variable: LNFINS

Method: ARDL

Selected Model: ARDL (1, 0, 0, 0)

Variables	Coefficient	Std. Error	t-Statistic	Prob.*
LNFINS (-1)	0.866819	0.080610	10.75329	0.0000
LNREMI	0.204712	0.084448	2.424123	0.0268
LNNBF	-0.178331	0.092471	-1.928495	0.0707
LNR	0.054765	0.097866	-2.668543	0.0458
C	-0.698819	0.258991	-2.698236	0.0152
R-squared	0.993995	Mean dependent var		5.328912
Adjusted R-squared	0.992935	S.D. dependent var		0.555275
S.E. of regression	0.046674	Akaike info criterion		-3.121629
Sum squared resid	0.037033	Schwarz criterion		-2.922673
Log likelihood	36.77711	Hannan-Quinn criterion.		-3.078451
F-statistic	937.9176	Durbin-Watson stat		2.035836
Prob(F-statistic)	0.000000			

Source: Calculated by Using EViews 10.

The empirical results presented in Table 4 show that financial savings are positively and significantly affected by remittance inflow in Nepal. The negative coefficient of real NBF shows that there is a negative effect of NBF on financial savings in Nepal for the selected time period of this study. There is a positive and significant effect of remittance on increasing the financial savings in the banking sector, particularly in the commercial banks of Nepal. The value of R^2 is 0.99. It shows that the control variables selected in the study explain the dependent variable, i.e., FINS, by 99 per cent. The value of the Durbin-Watson statistic is almost 2 (2.03), which shows that there is no serious autocorrelation between the selected variables in this model. The coefficient of the Log of Remittance is 0.204712. It shows that when remittances inflow increases by 1 per cent, it increases the financial savings in commercial banks by 0.204712 per cent in Nepal for the selected period of time.

The empirical findings of this study are similar to the findings of Baafi and Kwame Asiedu (2025); Osei-Gyebi, Opoku, Lipede and Kountchou (20230; Salahuddin, Masud and Kian Teng (2022); Hua, Kessels and Erreygers (2022); Přívara and Trnovský (2021); Kokorović Jukan, Okičić and Hopić (2020); Munir, Sial, Sarwar and Shaheen (2011).

The coefficient of the Log of remittance is 0.204712, and the probability is significant. It shows that when remittances increase by 1 per cent, Financial savings in Commercial banks increase by 0.204712 per cent, other things remaining the same. However, the coefficient of Log of NBF is -0.178331, and the probability is significant. The negative sign shows that NBF is negatively related to increasing financial savings.

ARDL Bounds Test for Cointegration and Error Correction Model

Bound tests for co-integration are done to identify the relationship between dependent and independent variables. It is an econometric tool used to identify whether there is a long-run relationship between the dependent and independent variables used in the study. According to Pesaran et al. (2001), the ARDL bound test is based on Joint F – Statistic, it is tested under the null hypothesis (H0) i.e., there is no cointegration among the variables used in the model against the alternative hypothesis (H1) i.e., there is cointegration, using lower bound I (0) and upper bound I (1). Table 5 shows the empirical results of the bounds tests.

Table 5: Result of ARDL Long Run Form and Bounds Test

Dependent Variable: D(LNFINS)

Selected Model: ARDL (1, 0, 0, 0)

F-Bounds Test				
Test Statistic	Value	Significance	I(0)	I(1)
F-statistic	8.67543	10%	2.65	3.55
k	3	5%	3.14	3.89
		2.5%	3.58	4.78
		1%	4.34	5.42

Source: Calculated by Using EViews 10.

Data presented in Table 5 show the ARDL bound test results for cointegration. The F-statistic for the bound test is 8.67543, which is more than the lower bound value of 4.34 and the upper bound of 5.42 at a 1 per cent level of significance. Thus, the empirical result justifies that there is a long-run equilibrium relationship between financial savings (FINS) with remittances (REMI) and the number of banks and financial institutions (NBF) and the rate of interest (R).

Estimation of Long Run Coefficients

Having gone through the cointegration of variables for the long run, the next step in the ARDL model is to estimate the long-run coefficients. To estimate the long-run ARDL model, an appropriate lag length is calculated according to the AIC criteria. The appropriate lag length for the model is ARDL (1,0,0,0). Table 6 presents the estimated long-run coefficients using the ARDL model.

Table 6: Estimated Long-Run Coefficients Using ARDL (1,0,0,0) Model based on AIC.

Dependent Variable: LNFINS Model Selected: ARDL (1,0,0,0) based on AIC.				
Variables	Coefficients	Std. Error	t-statistic	Prob.
LNREMI	1.537089	0.356490	4.311737	0.0005
LNNBF	-1.339008	0.433561	-3.088397	0.0067
LNR	0.078674	0.423166	-3.098766	0.0456
C	-5.562759	2.780331	-2.000754	0.0617

Source: Calculated by Using EViews 10.

Table 6 presents the estimated long-run coefficients using the ARDL model. The correlation of LNREMI with LNFINS is positive and statistically significant at 1 %. However, LNNBF is negative with LNFINS, LNR is positive, and the result is statistically significant at 1% and 5% levels of significance.

When remittance inflow increases by 1 %, it leads to a 1.53 % increase in financial savings in the long run. However, the coefficient of LNNBF is negative. It justifies that the number of banks and financial institutions does not support financial savings. The empirical findings of this study are similar to the findings of Baafi and Kwame Asiedu (2025); Osei-Gyebi, Opoku, Lipede and Kountchou (20230; Salahuddin, Masud and Kian Teng (2022); Hua, Kessels and Erreygers (2022); Přívara and Trnovský (2021); Kokorović Jukan, Okičić and Hopić (2020); Munir, Sial, Sarwar and Shaheen (2011).

The empirical finding of the error correction model is presented in Table 7. The coefficient of CointEq is negative (- 0.143181) and the probability is significant.

Table 7: Result of Error Correction Model

Dependent Variable: D(LNFINS)

Selected Model: ARDL (1, 0, 0,0)

ECM Regression Case 2: Restricted Constant and No Trend				
Variables	Coefficient	Std. Error	t-Statistic	Prob.
CointEq(-1)*	-0.143181	0.013472	-8.786617	0.0000

Source: Calculated by Using EViews 10.

The negative coefficient of the error correction model (-0.14) shows that our model is theoretically correct, and the probability shows that it is statistically significant. The absolute value of the coefficient of ECM indicates the speed of adjustment towards the long-run equilibrium through several short-run adjustments. The model tends towards equilibrium at a speed of adjustment of around 14.0 per cent per annum.

Residual Diagnostics

Once the empirical model is estimated, residual diagnostic tests are applied to evaluate the model residuals and test the model's adequacy. For the same, Serial correlation (LM Test), Heteroscedasticity and Normality tests are conducted, and their results are presented in Table 8,

Table 9, and Figure 1 below.

Table 8: Empirical Result of Breusch-Godfrey Serial Correlation LM Test

F-statistic	0.506971	Prob. F (2,15)	0.6123
Obs*R-squared	1.329639	Prob. Chi-Square (2)	0.5144

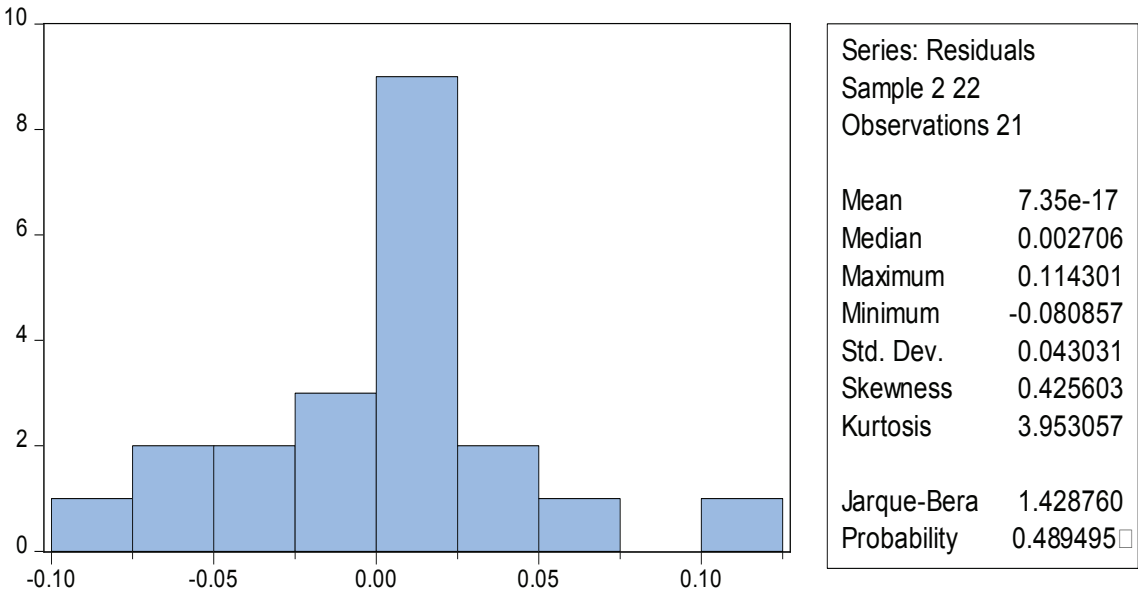
Source: Calculated by Using EViews 10.

Table 9: Empirical Result of Breusch-Pagan-Godfrey Heteroskedasticity Test

F-statistic	1.283388	Prob. F(3,17)	0.3120
Obs*R-squared	3.877833	Prob. Chi-Square (3)	0.2750
Scaled explained SS	3.752236	Prob. Chi-Square (3)	0.2895

Source: Calculated by Using EViews 10.

Figure 1: Empirical Result of Normality Test (Histogram)



The summary statistics and results of residual diagnostics are presented in Table 10.

Table 10: Results of Residuals Diagnostics Tests and Conclusion

Test	Serial Correlation LM Test	Heteroskedasticity Test	Normality Test Histo-gram
F-Value	0.506971	1.283388	1.428760
Probability	0.6123	0.3120	0.4894
Conclusion	No serial correlation as Prob. > 10 per cent.	No Heteroskedasticity as Prob. > 10 per cent.	Normal as prob. Is > 10 per cent

Stability Diagnostics

The stability test for the financial savings model has been applied in order to investigate the stability of the long-run and short-run parameters. For the same, cumulative sum (CUSUM) and cumulative sum of squares (CUSUM SQ) tests are employed. It verifies the stability of the ARDL model for structural break because both models are significant at the 5 per cent level of significance. The results of the CUSUM and CUSUM of Square tests are shown in Figures 2 and 3, respectively.

Figure 2: Plot of Cumulative Sum of Recursive Residuals

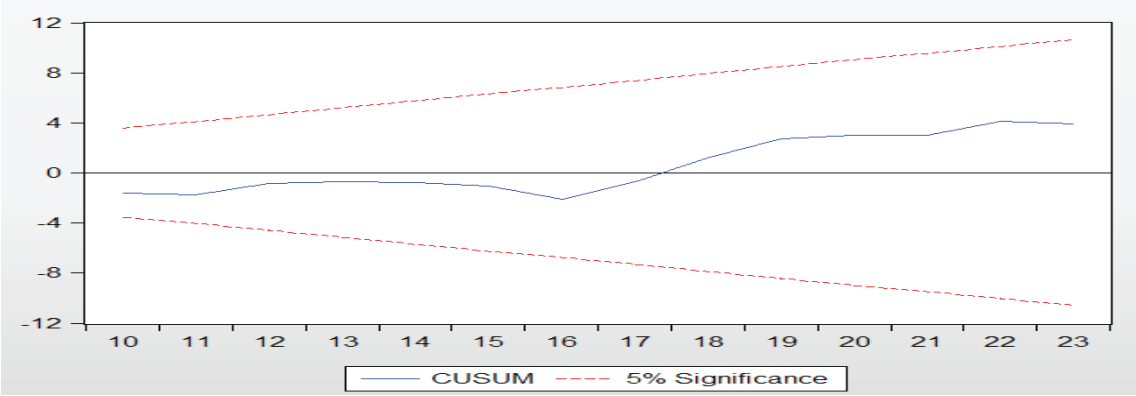
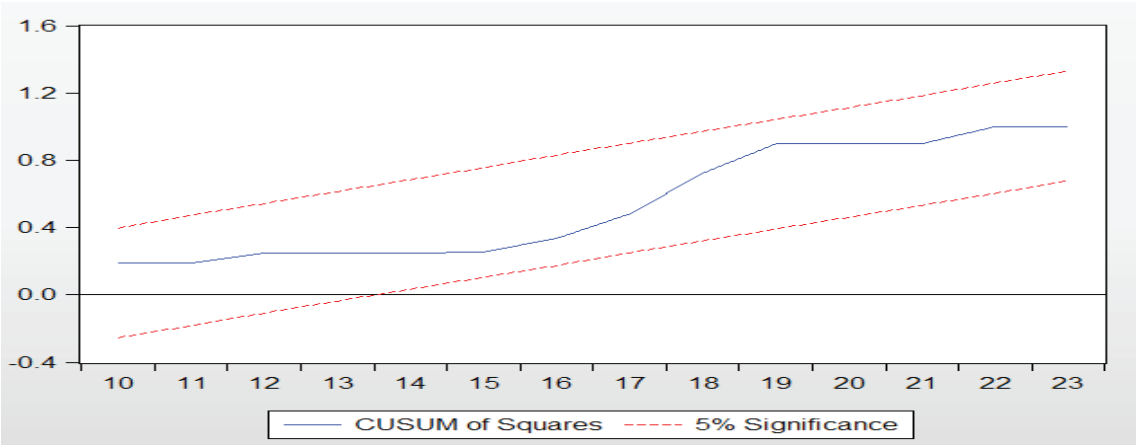


Figure 3: Plot of Cumulative Sum of Squares of Recursive Residuals



DISCUSSION

This study was conducted to identify the effects of foreign remittances on the financial savings in Nepal by employing the ARDL Bounds Testing Model by using the time series data for 24 years, spanning from 2001-2024, collected from various published sources of Nepal government such as the Ministry of Finance (MOF), Nepal Rastra Bank (NRB) and National Statistics Office (NSO). This study found a positive and statistically significant relationship between remittances and financial savings in Nepal. The impacts of other control variables, NBF is negative and

significant, and the effect of the rate of interest (R) is positive and significant for financial savings in Nepal. The empirical findings of this study are similar to the findings of Baafi & Asiedu (2025); Hua et al. (2022); Kokorovic Jukan et al. (2020); Munir et al. (2011); Osei-Gyebi et al. (2023); Privara & Trnovsky (2021); and Salahuddin et al. (2022).

There is a positive and statistically significant relationship between financial savings and remittances in Nepal primarily because remittances serve as a key source of disposable income for recipient households, enabling them to save more. In many cases, remittances exceed immediate consumption needs, allowing families to deposit the surplus in banks and financial institutions. This inflow of funds boosts household financial stability and promotes long-term financial planning, especially in a country like Nepal, where domestic employment opportunities are limited and income levels are generally low. Furthermore, increased access to formal financial services, financial literacy programs, and government incentives to channel remittances through official banking systems encourage the savings behaviour of people. Remittances are also often sent with the explicit intention of supporting future investments—such as in education, healthcare, or small businesses—further reinforcing the habit of saving. Thus, the linkage is not only behavioural but also structural, reflecting both economic necessity and increased financial inclusion.

The negative and statistically significant relationship between financial savings and the number of banks and financial institutions in Nepal may seem counterintuitive, but it can be explained by several structural and behavioural factors. First, the rapid increase in the number of banks and financial institutions (BFIs), especially in rural and semi-urban areas, has led to intense competition, often resulting in aggressive credit expansion rather than promoting savings. Many institutions prioritise lending to increase profitability, offering relatively low interest rates on deposits, which discourages savings. Second, the proliferation of BFIs without proportional improvements in financial literacy and trust in the banking system may lead to confusion or scepticism among the population, especially in less educated or remote communities. Additionally, people may split their deposits across multiple institutions for safety or accessibility, leading to a dilution effect where individual account balances remain low, thus reflecting lower total savings per institution. Finally, the increasing availability of consumer credit may incentivise spending over saving, as easier access to loans can reduce the perceived need to maintain large savings. Hence, more institutions do not necessarily translate into more savings, especially when financial behaviour and institutional incentives are not aligned toward savings mobilisation.

The positive and significant relationship between the rate of interest on deposits and financial savings in Nepal can be attributed to the fundamental economic principle of incentive-driven behaviour. When banks offer higher interest rates on deposits, savings become more attractive to individuals and households, as they receive greater returns on their idle funds. In a country like Nepal, where many people live on limited incomes, even small increases in interest rates can significantly influence saving decisions. Higher deposit rates not only encourage people to save more rather than consume or invest in informal channels, but also draw money out of non-institutional forms of saving (like gold, cash holdings, or informal lending) into formal financial systems. Additionally, in an environment where inflation is a concern, attractive deposit rates help preserve and grow the real value of savings, further reinforcing the motivation to save. Thus, higher interest rates act as a financial incentive that shifts household preferences toward formal savings, contributing to the observed positive relationship.

CONCLUSION

This study investigates the relationship between remittances and financial savings in Nepal using the Autoregressive Distributed Lag (ARDL) model on annual data spanning from 2001 to 2024. The dependent variable, financial savings (LnFINS), is analysed in relation to the core independent variable, remittance inflows (LnREMI), with the number of banks and financial institutions (LnNBF) included as a control variable. Empirical results reveal that remittances have a statistically significant and positive impact on financial savings in both the short run and the long run. Conversely, the number of financial institutions displays a significant but negative relationship with financial savings, suggesting that quantity does not necessarily translate to quality or accessibility in Nepal's financial sector. There is a positive and significant effect of remittance on increasing the financial savings in the banking sector, particularly in the commercial banks of Nepal. The value of R^2 is 0.99. It shows that the control variables selected in the study explain the dependent variable, i.e., FINS, by 99 per cent. The value of the Durbin-Watson statistic is almost 2 (2.03), which shows that there is no serious autocorrelation between the selected variables in this model. The coefficient of the Log of Remittance is 0.204712. It shows that when remittances inflow increases by 1 per cent, it increases the financial savings in commercial banks by 0.204712 per cent in Nepal for the selected period. The findings underscore the vital role of remittances in enhancing domestic financial savings in Nepal, indicating that migrant earnings are channelled into the formal financial system when favourable conditions exist. However, the negative impact of the increasing number of financial institutions on savings points to possible inefficiencies, such as overlapping services, poor financial literacy, or limited financial inclusion, particularly in rural areas. Policymakers should prioritise remittance-focused financial instruments and incentives to encourage savings, such as diaspora bonds, interest-bearing remittance accounts, and mobile-based saving platforms. Additionally, rather than expanding the number of institutions, emphasis should be placed on strengthening institutional governance, accessibility, digital transformation, and financial education to increase trust and usability of the formal banking system.

Future studies could expand the current analysis by incorporating household-level microdata to understand the behavioural dynamics behind remittance usage and saving patterns. Investigating the role of financial literacy, gender, and regional disparities could offer granular insights into how remittances translate into productive savings. Moreover, assessing the impact of digital banking, mobile money, and fintech innovations on the remittance-savings nexus would be crucial in the context of Nepal's evolving financial ecosystem. Comparative studies with other remittance-dependent economies in South Asia could further enrich the understanding and generalizability of the findings.

CONFLICT OF INTEREST

The authors declared no conflict of interest.

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UNDERSTANDING TRANSITION MATRICES AND THEIR ROLE IN ANALYZING VIRUS MUTATION

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ABSTRACT

Transition matrices are a valuable tool for understanding the mutation and evolution of viruses. They provide insights into the probabilities of genetic changes, helping researchers make informed decisions in the development of vaccines, antiviral treatments, and public health strategies. As technology and data collection methods continue to advance, transition matrices will play an increasingly significant role in our ongoing battle against viral diseases, helping us stay one step ahead of the ever-changing world of viruses.

Keywords: *transition matrix, virus, viral infection, health services, public health*

INTRODUCTION

The concept of transition matrices is a fundamental tool in various fields of science and mathematics. In biology and virology, transition matrices play a crucial role in understanding the evolution and mutation of viruses (Koonin, 2016; Sole et al., 2021). Viruses are known for their ability to adapt and evolve rapidly, and transition matrices provide a powerful method for analysing and predicting these mutations.

Multiple factors, such as polymerase fidelity, sequence context, template secondary structure, cellular milieu, replication processes, proofreading, and post-replicative repair, influence viral mutation rates. Certain diversity-generating elements encoded in viruses and host-encoded cytidine/adenine deaminases can introduce large numbers of mutations (Sanjuan & Calap, 2016). A well-established framework for evaluating the fitness costs and advantages of such features is provided by Otero and Sanjuan's (2022) evolutionary perspective.

Great mathematicians and scientists like Hanssen et al. (2010), XU et al. (2017), De Almeida et al. (2020), Rodriguez et al. (2019 & 2020), De Almeida et al. (2022) and Garcia-Estrada et al. (2022) have published numerous papers on the issue of viruses, including their breeding, dispersion, evolution, and mechanisms.

This article explores the fundamentals of transition matrices and their applications in studying virus mutation, beginning with a historical overview of viruses.

HISTORY OF VIRUSES

Early References to Viruses

One of the earliest references to viral disease is found in Homer's mention of "rabid dogs," referring to rabies. Mesopotamians were also aware of rabies. Polio, caused by a virus, was depicted in ancient Egyptian artwork as lower limb paralysis (Mehndiratta et al., 2014). In South and Central America, smallpox epidemics devastated populations, a virus now eradicated worldwide (Henderson, 2011).

The Discovery of Viruses

Between 1886 and 1903, Ivanovsky first noted bacteria-like substances, and in 1898, Beijerinck demonstrated the filterable nature of viruses, proving them to be obligatory parasites (Ananthanarayan, 2006). Viruses cannot survive independently, and their genetic makeup can change over time, sometimes increasing or reducing virulence in the human host. Errors during genome replication make viruses prone to mutation, although complex organisms possess efficient proofreading mechanisms (Mandal, 2023).

The Origin of Viruses

Despite extensive study, the origins of viruses remain uncertain due to the absence of viral fossils. Their delicate structures prevent fossilisation or long-term preservation (Emerman & Malik, 2010). Research, therefore, relies on isolated viruses or recent material. Viruses likely originated in aquatic environments alongside hosts and later diversified as life spread onto land (Holland & Domingo, 1998; Emerman & Malik, 2010). Today, nearly all life forms, from fungi and bacteria to plants and archaea, host viruses (Forterre, 2010; Leonard & Toro, 2023).

VIRUS MUTATION

A mutation is a change in the genetic material, either DNA or RNA, from the original normal or "wild type" version of the genome of a particular organism or biological entity (Baake & Gabriel, 2000). The mutation may have occurred previously, or it may be entirely new. The natural process of creatures evolving and changing is called evolution. Geographic segregation is one process that can lead to the emergence of distinct lineages (strains or variants, depending on the preferred term). The presence of mutations in the SARS-CoV-2 coronavirus was neither unexpected nor surprising (Callway, 2020; Mandal, 2023).

TRANSITION MATRIX

Definition

A transition matrix is a square matrix that describes the probabilities of transitioning from one state to another in a Markov process. In the context of virus mutation, these states represent different genetic variants of the virus. Transition matrices can be used to model and quantify the rates of genetic changes, the emergence of new strains, and the likelihood of specific mutations occurring over time (Otero & Sanjuan, 2022).

Stochastic matrix

A transition matrix is a stochastic matrix whose (i, j) entry specifies the probability that an element will move from state s_i to state s_j during the next phase of the process. The probability is denoted by P_{ij}, and it is independent of which states the chain was in prior to the current state. Transition probabilities are the probability P_{ij}.

$(P_t)_{i,j} = \mathbb{P}(X_{t+1} = j | X_t = i)$.

$$P = \begin{bmatrix} P_{1,1} & P_{1,2} & \cdots & P_{1,j} & \cdots \\ \vdots & & \ddots & \vdots & \\ P_{i,1} & P_{i,2} & \cdots & P_{i,j} & \cdots \end{bmatrix}$$

This shows each row of the matrices is a probability vector and the sum of its entries is 1. The probability for going from state I to j is now calculated to be the following (Satorra, 2016):

$P_r(j|i) = P_{i,j}$

One important remark is that the row probability sums up to 1, since the sum of the probabilities of going from state i to any state is 1 (100 %). The probability of going from any state to another in k steps for a Markov chain can be calculated by using the matrix P. The probability is then given by P^k (Satorra, 2016).

N-step transition matrix

This higher-order transition matrix and find the chance of that transition occurring over multiple steps. The N-step matrix is calculated by raising the transition matrix to the power of N.

Properties of the transition matrix

The product of subsequent ones describes a transition along the time interval spanned by the transition matrices.

$P_0 . P_1$ has its $(i,j)^{th}$ position, the probability X_2 = j given that X_0 = 1. In general, $(i,j)^{th}$ position of the $P_t . P_{t+1}$ is the probability

$\mathbb{P}(X_{t+k+1} = j | X_t = i)$.

Theorem 1. Prove that for any natural numbers t and states i,j$\in S$, the matrix entry

$(P_t . P_{t+1})_{i,j} = \mathbb{P}(X_{t+2} = j = i)$.

Proof. Let M = P_{t}, for matrix multiplication,

$M_{i,j} = \sum_{k=1}^{n} (P_t)_{i,k} (P_{t+1})_{k,j} = \sum_{k=1}^{n} \mathbb{P}(X_{t+1} = k | X_t = i) \mathbb{P}(X_{t+2} = j | X_{t+1} = k)$

$= \mathbb{P}(X_{t+2} = j | X_t = i)$ is the expression of conditional probability.

The

$$P_t^k = \begin{pmatrix} \mathbb{P}(X_{t+k} = 1 | X_t = 1) & \mathbb{P}(X_{t+k} = 2 | X_t = 1) & \mathbb{P}(X_{t+k} = n | X_t = 1) \\ \mathbb{P}(X_{t+k} = 1 | X_t = 2) & \mathbb{P}(X_{t+k} = 2 | X_t = 2) & \mathbb{P}(X_{t+k} = n | X_t = 2) \\ \vdots & \vdots & \ddots \quad \vdots \\ \mathbb{P}(X_{t+k} = 1 | X_t = n) & \mathbb{P}(X_{t+k} = 2 | X_t = n) & \mathbb{P}(X_{t+k} = n | X_t = n) \end{pmatrix}$$

$P_t^k =$

Example. For the time-independent Markov chain described by the picture below. What is its 2-step transition matrix?

The matrix is P = $\begin{pmatrix} .4 & .6 \\ .8 & .2 \end{pmatrix}$

Diagram 1.

Now, from- two-step transition matrix is

$P^2 = \begin{pmatrix} .4 & .6 \\ .8 & .2 \end{pmatrix} * \begin{pmatrix} .4 & .6 \\ .8 & .2 \end{pmatrix}$ where * is multiplication.

$\begin{pmatrix} .4 \times .4 + .8 \times .6 & .4 \times .6 + .4 \times .2 \\ .8 \times .4 + .2 \times .8 & .8 \times .6 + .2 \times .2 \end{pmatrix} =$

$\begin{pmatrix} .64 & .32 \\ .48 & .52 \end{pmatrix}$ process changing from one state to another state.

Diagram 1 denotes a two-state Markov process. Here, the arrows originate from the current state and point to be future state, and numbers associated with the arrows indicate the probability of the Markov process E changing from one state to another state.

ROLE OF TRANSITION MATRICES IN VIRUS MUTATION

Transition matrices are used to analyse the evolutionary pathways of viruses. By studying the probabilities of genetic changes occurring from one viral strain to another, researchers can construct a picture of how the virus mutates and adapts. This information is invaluable for understanding the origins and spread of viral outbreaks. Transition matrices allow researchers to predict the future mutational patterns of a virus. By analysing historical data, one can estimate the likelihood of specific mutations occurring in the future. This predictive capability is essential for designing effective vaccines and treatments. Transition matrices are employed in phylogenetic studies to build evolutionary trees of viral strains. By calculating the probabilities of mutations, researchers can determine the relationships between different viral variants and their common ancestors.

In the case of viruses like HIV or influenza, transition matrices help analyse the development of drug resistance. They provide insights into how a virus may evolve to overcome antiviral treatments, enabling healthcare professionals to adapt treatment strategies accordingly. Transition matrices can guide vaccine development by identifying stable viral strains and predicting the likelihood of specific mutations that could impact vaccine efficacy. This information aids in the design of vaccines that offer broader and longer-lasting protection.

MATERIALS AND METHODS FOR TRANSITION MATRIX

The construction of a transition matrix for virus mutation typically involves gathering genetic sequence data from a population of the virus over time. By comparing these sequences, researchers can identify specific mutations that have occurred and determine their probabilities. These probabilities are then organised into a matrix format, with rows and columns representing different genetic states and the entries indicating the probabilities of transitioning from one state to another.

CHALLENGES

The use of transition matrices in virus mutation analysis is not without challenges. Gathering accurate genetic data and establishing mutation probabilities can be complex, especially for rapidly evolving viruses. Additionally, the accuracy of predictions depends on the quality and quantity of data available. Let a virus exist in N different strains, and in each generation, either stays the same or, with probability α, mutates to another strain, which is chosen at random.

The probability of the strain is calculated as an N-state chain with $N \times N$ transition matrix P given by

$P_{ii} = 1-\alpha$, $P_{ij} = \alpha/(N-1)$ for I $\neq j$ $\rightarrow$ (1)

From this N-step transition matrix model, we can find the probability of the strain in other generation and nth generation. This will give information about all generations and can answer whether same or different. This information would be found by computing $P_{11}^{(n)}$.

In fact, there is a much simpler approach that depends on exploiting the symmetry present in the mutation rules.

At any time, a transition is made from the initial state to another with probability α and a transition from another state to the initial state with probability $\alpha/(N-1)$.

So, we have a two-state chain diagram, and by putting $\beta/(N-1)$ in, we show the relation,

$P^{n+1} = P^n$P and suppose initial state 1 and other state 2, then I = 1, j = 2 gives

$$P_{11}^{(n+1)} = P_{12}^{(n)} + P_{11}^{(n)}(1-\alpha) \rightarrow (2)$$

We can also simplify that

$P_{11}^{(n)} + P_{12}^{(n)} + P_1(X_n = 1 \text{ or } 2)$ eliminating P_{12} so new relation

$P_{11}^{(n+1)} = (1-\alpha-\beta)P_{11}^{(n)} + \beta$ and $P_{11}^{(0)} = 1$

$$P_{11}^{(n)} = \frac{\beta}{\alpha+\beta} + \frac{\alpha}{\alpha+\beta}(1-\alpha-\beta)^n \quad ; \alpha+\beta > 0 \quad ; \alpha+\beta = 0$$

Now putting $\beta/(N-1)$ then

$$P_{11}^{(n)} = \frac{\alpha/(N-1)}{\alpha+\alpha/N-1} + \frac{\alpha}{\alpha+\frac{\alpha}{(N-1)}} \rightarrow (3)$$

On solving, we get the probability

$$\frac{1}{N} + \left(1-\frac{1}{N}\right)\left(1-\frac{\alpha N}{N-1}\right)^{n} \rightarrow (4)$$

With the help of Equation (4), we can study the virus mutation.

CONCLUSION

A useful mathematical tool for modelling, analysing, and interpreting transitions between several states is a transition matrix. Its uses cut across many different domains and specialities, supporting decision-making, forecasting results, and helping to understand system dynamics. Unlocking a transition matrix's potential and utilising its analytical power requires an understanding of its fundamentals, mathematical underpinnings, construction procedure, and interpretation techniques.

CONFLICT OF INTEREST

The authors declared no conflict of interest.

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SOCIO-DEMOGRAPHIC PATTERNS OF HYPERTENSION AND ITS ASSOCIATION WITH TOBACCO USE IN NEPAL: EVIDENCE FROM THE COUNTRY REPRESENTATIVE DEMOGRAPHIC AND HEALTH SURVEY

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ABSTRACT

Introduction: *Cardiovascular diseases (CVDs) account for a third of global deaths, with growing burdens in South Asia. Hypertension is a leading modifiable CVD risk factor, and tobacco use—smoked and smokeless—remains common in Nepal. We examined the association between tobacco use and hypertension and described sociodemographic patterns of hypertension using nationally representative data.*

Methods: *We analysed Nepal Demographic and Health Survey (NDHS) 2016 data, as the data of 2022 were not available while requesting the data access through DHS and drafting this manuscript in late 2022 to early 2023. For prevalence by sociodemographic characteristics (age, province, ecological zone, residence, education, wealth), we included 10,470 adults aged 15–49 years with valid blood pressure (BP) measures (6,364 women; 4,106 men). For tobacco–hypertension associations, 40 participants lacked tobacco data; thus, analyses used 10,430 individuals (6,344 women; 4,086 men). BP was measured three times with validated devices; the mean of the second and third readings defined categories (normal, pre-hypertension, Stage 1–3). Hypertension was SBP ≥140 mmHg and/or DBP ≥90 mmHg or antihypertensive use. We employed descriptive statistics and Chi-square tests and logistic regression for the association of hypertension with any tobacco use ($p<0.01$).*

Results: *Hypertension prevalence was 16.8% in women and 23.4% in men, rising steeply with age. Urban residents exceeded rural, and the Hill ecological zone exceeded the Mountain and Terai. By province, burdens were highest in Gandaki and Bagmati. An inverse educational gradient (highest in no schooling) contrasted with a wealth gradient (highest in the richest quintile). Tobacco use was associated with higher hypertension in both sexes: among women, 15.8% of users versus 9.9% of non-users; among men, 19.9% versus 13.3% (both $p<0.01$). BP distributions shifted from normal to pre-hypertension and Stage 1–2 among users.*

Conclusion: *In Nepal, tobacco use is significantly associated with higher prevalence and severity of hypertension across diverse sociodemographic strata. Integrating tobacco cessation into hypertension detection and control—alongside salt reduction, physical activity, healthy weight, reduced alcohol, and cleaner air—should be prioritised. Future multivariable and longitudinal studies should disentangle tobacco form, intensity, and confounding to refine CVD prevention.*

Keywords: *Tobacco Use, Cardiovascular Diseases, Hypertension, Demographic and Health Survey, Asia, Nepal*

INTRODUCTION

Cardiovascular diseases (CVDs) are responsible for about 32% of all deaths worldwide each year, with the highest rates of CVDs found in countries in South Asia (Gaziano, 2022; Raheem et al., 2022; Zhao, 2021). Out of all CVD deaths globally, over 80% are caused by heart attacks and strokes, and a significant portion of these deaths occur prematurely in individuals under the age of 70 (Ferrari et al., 2021; Mensah et al., 2023). Cardiovascular diseases, also known as CVDs, encompass a range of disorders affecting the heart and blood vessels. These include conditions such as coronary heart disease, cerebrovascular disease, and rheumatic heart disease, among others (Castaneda et al., 2016; Wiseman et al., 2016).

According to the World Health Organisation (WHO), systolic blood pressure ≥140 mmHg and/or diastolic blood pressure ≥90 mmHg on two different days is called hypertension (WHO, 2023). It is the leading risk factor for cardiovascular diseases (CVDs). It significantly increases the likelihood of developing heart, brain, kidney, and other health issues (Mavrogeni et al., 2022; Mensah et al., 2002; Meissner, 2016). Hypertension, a complex condition linked to several cardiovascular diseases, is becoming a significant risk factor for young people as it progresses (Gooding et al., 2020; Steinberger et al., 2009). Hypertension has several risk factors, both modifiable and non-modifiable. Modifiable risk factors include an unhealthy diet, lack of physical activity, smoking, and excessive alcohol consumption, as well as obesity (Mayega et al., 2012; Samadian et al., 2016). Non-modifiable risk factors include a family history of hypertension, being over the age of 65, and having coexisting conditions such as diabetes and chronic kidney disease (Bozkurt et al., 2016; Palliyaguruge Abeywickrama & Niranji, 2024; Ranasinghe et al., 2015).

Hypertension and the consumption of tobacco are the leading causes of preventable deaths worldwide. Smoking cigarettes temporarily raises the heart rate and blood pressure, and negatively impacts the heart's ability to contract (Prasad et al., 2010; WHO, 2020). Smoking actively can have harmful effects on the smoker themselves, but exposure to secondhand smoke can also harm those who do not smoke, such as innocent bystanders (Adhami et al., 2016). It is well-known that smoking can increase blood pressure as we age. This increase is caused by a combination of various factors, including not only ageing but also unique environmental and lifestyle factors (Neaton & Wentwort, 1992; Omvik, 1996). Smoking contributes to air pollution, and numerous epidemiological studies have shown that exposure to air pollution can lead to an increase in cardiovascular disease and death. It is believed that changes in blood pressure may play a role in this association (Al-Kindi et al., 2020; Aryal et al., 2022; Franklin et al., 2015; Lee et al., 2014).

In Nepal, it is estimated that approximately 27,100 deaths each year, which is roughly 14.9% of

all deaths, are caused by illnesses related to the use of tobacco (WHO, 2018). The use of tobacco has led to an increase in hypertension in Nepal (Lan et al., 2021). The prevalence of hypertension in Nepal varies among genders and different provinces. It is found to be twice as common among men aged 30–34 years (21%) compared to women of the same age group (10%) (NDHS, 2016). Factors such as the education level of a person's partner, the medical history of their parents, and their weight (specifically, if they are obese) play a significant role in the prevalence of hypertension (Thapa et al., 2022). In Nepal, the rate of tobacco consumption among boys aged 13 to 15 was reported to be higher than that of girls. Among individuals between the ages of 15 and 69, 28.9% reported regularly using tobacco in any form (48.3% men; 11.6% women). Additionally, 17.1% of adults—about 2.8 million individuals—were currently smoking tobacco (28.0% men; 7.5% women) (WHO, 2018).

While CVDs remain the leading cause of death worldwide, limited studies are available on the linkage of CVDs with tobacco consumption in developing countries such as Nepal. Therefore, this study aims to identify the existing situation of tobacco use and its association with hypertension—as a key risk factor for cardiovascular diseases—in the context of a developing country with special reference to South Asia, by analysing nationally representative DHS 2016 data of Nepal. In line with current evidence and Nepal's epidemiological profile, we describe the distribution of hypertension by age, province, ecological zone, residence, education and wealth, and examine the association between any tobacco use and hypertension.

METHODS

Study sites: Nepal is a landlocked country. It lies on the southern face of the Himalayan mountain range, located between China in the north and India on three sides: east, west and south. Its total land area is 147,516 square kilometres (km²), and it lies between latitudes of 26°22' to 30°27' North and longitudes 80°04' to 88°12' East. Nepal has three broad ecological regions: Tarai (17%), Hill (62%) and Mountain (21%). Nepal is divided into 77 districts and seven administrative provinces. In the federal system of the country, provinces are further subdivided into local governance units (i.e., municipal and village councils) (Pradhan, 2017). Selected districts of Nepal, as covered by the Nepal Demographic and Health Survey (NDHS) 2016, were considered for this study.

Data source and design: Given that the 2022 NDHS data were unavailable at the time of data access and writing (late 2022–early 2023), we conducted our analyses using the 2016 NDHS, a country-representative cross-sectional study (MoHP et al., 2017), conducted by the Ministry of Health in collaboration with the United States Agency for International Development as part of the global DHS Program. The survey includes women and men aged 15–49 years, and the NDHS biomarker module obtained blood pressure measurements among individuals aged 15 years and older. The survey used stratified multistage cluster sampling in 14 strata sampled from rural and urban areas across the seven provinces. Wards were the key sampling units in each stratum. Probability proportional to size was used to select units. The study divided the 383 PSUs into 30 equal-probability groups to select households (MoHP, 2017).

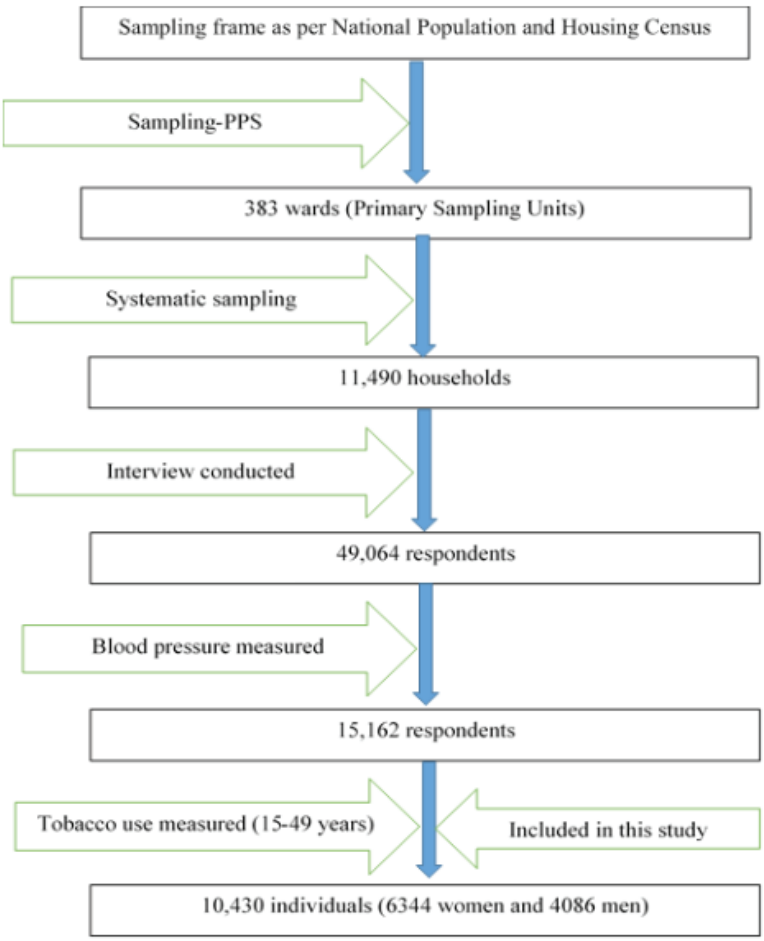

Figure 1. Process of selection of study participants

Study population and sample: For the results presented in Tables 1 and 2, we analysed NDHS 2016 data on **10,470** adults (6,364 women and 4,106 men) aged 15–49 years for whom hypertension was measured. For twenty women and twenty men, data on tobacco use were unavailable. Therefore, analyses of the association between tobacco use and hypertension (Tables 3–6) were conducted among 10,430 individuals (6,344 women and 4,086 men). This analytic split preserves comparability of prevalence estimates by sociodemographic characteristics (Tables 1–2) and maximises available data for tobacco–hypertension associations (Tables 3–6).

Variables of the study: Hypertension—measured in NDHS 2016 as the immediate risk factor for CVD—was the dependent variable. Independent variables included age, sex, province, ecological zone (Mountain, Hill, Terai), place of residence (urban/rural), ethnicity, occupation, education level, household wealth quintile, and any tobacco use.

Measurement of blood pressure: Blood pressure was assessed in participants aged 15 years and older using validated UA-767F/FAC automated monitors during individual interviews. Three

sequential readings were obtained at intervals of at least five minutes, and the mean of the second and third measurements was used for hypertension classification in accordance with WHO (1999) and NIH (1997) criteria. Participants were subsequently provided with their results alongside educational materials on hypertension symptoms and preventive strategies.

Hypertension definition: Participants were identified as hypertensive if systolic pressure was ≥140 mmHg and/or diastolic pressure ≥90 mmHg, or if they reported current use of antihypertensive medication despite lower readings. Those with systolic values between 120–139 mmHg and/or diastolic values between 80–89 mmHg were categorised as pre-hypertensive (NIH, 2004). Hypertension severity was further stratified into stage 1 (140–159/90–99 mmHg), stage 2 (160–179/100–109 mmHg), and stage 3 (≥180/≥110 mmHg) following WHO (1999) thresholds.

Data analysis: The data analysis process incorporated descriptive and inferential statistics. We described the prevalence of hypertension across age groups, provinces, ecological zones, residence (urban/rural), education, and wealth quintiles (Tables 1–2). We then examined the association of hypertension with any tobacco use using the Chi-square test (Tables 3–6). Statistical significance was assessed at $P < 0.05$ (two-sided). The outcomes were presented as prevalence percentages with 95% confidence intervals where applicable. Data were analysed using IBM SPSS version 20 (IBM Corp., Armonk, N.Y., USA).

Ethical approval: Before the execution of the NDHS 2016 survey, the Inner City Fund (ICF) International Institutional Review Board and the Nepal Health Research Council (NHRC) cleared the protocol. In advance of the interviews for NDHS, written informed consent was obtained from respondents. For this study, the DHS Program granted access to the NDHS 2016 SPSS dataset to the corresponding author, and ethical considerations were followed throughout.

RESULTS

Background characteristics of the respondents

The findings yielded from the analysis of data encompass the background socio-demographic characteristics of respondents, the association of tobacco use with sociodemographic variables, and the effect of tobacco use on the risk of CVD.

The background characteristics of the respondents constitute socio-demographic characteristics such as age group, ethnicity, education level, religion, province, place of residence (urban/rural), and wealth quintile.

Table 1. Prevalence of hypertension by socio-demographic characteristics of women (aged 15-49 years)

Background characteristic	Prevalence of hypertension	Number of women
Age		
15-29	4.1	3,436
15-19	2.9	1,260
20-24	3.2	1,176
25-29	6.7	999
30-44	15.6	2,408

30-34	9.8	933
35-39	16.6	813
40-44	22.4	662
45-69	32.6	2,161
45-49	27.9	522
50-54	27.5	533
55-59	32.2	430
60-64	39.2	389
65-69	42.0	287
70+	46.0	430
15-69	15.2	8,005
Residence		
Urban	17.2	5,153
Rural	16.2	3,282
Ecological		
Mountain	16.6	526
Hill	18.5	3,729
Terai	15.3	4,180
Province		
Koshi	17.7	1,479
Madhesh	13.1	1,699
Bagmati	19.1	1,789
Gandaki	23.8	877
Lumbini	18.8	1,406
Karnali	10.1	440
Sudurpashchim	10.2	744
Education		
No education	23.6	4,009
Primary	15.0	1,158
Some secondary	9.2	1,655
SLC and	9.1	1,608
Wealth quintile		
Lowest	14.9	1,540
Second	16.9	1,678
Middle	14.2	1,743
Fourth	14.6	1,808
Highest	23.6	1,667
Total	**16.8**	**8,435**

Among women, the overall prevalence of hypertension was 16.8% (N = 8,435). Prevalence rose steeply with age: 2.9% at 15–19 years, 3.2% at 20–24, 6.7% at 25–29, 9.8% at 30–34, 16.6% at

35–39, 22.4% at 40–44, and 27.9% at 45–49; in the older bands listed in the table, prevalence reached 39.2% (60–64) and 46.0% (≥70).

Geographically, urban women had slightly higher hypertension than rural women (17.2% vs. 16.2%). Across ecological zones, the Hill region had the greatest burden (18.5%), followed by the Mountain (16.6%) and the Terai (15.3%). By province, prevalence was highest in Gandaki (23.8%), followed by Bagmati (19.1%), Lumbini (18.8%), and Koshi (17.7%), and lowest in Karnali (10.1%) and Sudurpashchim (10.2%); Madhesh was 13.1%.

Socioeconomic gradients were pronounced. Hypertension was highest among women with no education (23.6%), substantially lower among those with primary (15.0%) and some secondary (9.2%) schooling, and lowest among those with SLC and above (9.1%). By wealth, prevalence peaked in the highest quintile (23.6%) versus 14–17% in the other quintiles.

Overall, hypertension among women displays a clear age gradient and a geographic concentration in urban areas, the Hill ecological zone, and particularly Gandaki Province. The pattern also indicates higher prevalence with lower education yet higher prevalence in the richest households, suggesting that behavioural and environmental exposures linked with urbanisation and affluence (e.g., diet, sedentary work) may coexist with education-related protective effects; these deserve exploration in multivariable analyses.

Table 2. Prevalence of hypertension by socio-demographic characteristics of men (aged 15-49 years)

Background characteristic	Prevalence of hypertension	Number of men
Age		
15-29	7.1	2,117
15-19	2.5	949
20-24	8.4	635
25-29	13.6	532
30-44	25.1	1,562
30-34	21.1	557
35-39	26.1	541
40-44	28.7	465
45-69	35.3	1,915
45-49	34.6	427
50-54	29.5	462
55-59	36.3	404
60-64	39.2	337
65-69	39.8	284
70+	43.1	466
15-69	21.8	5,593
Residence		

Urban	25.2	3,741
Rural	20.5	2,318
Ecological		
Mountain	18.0	378
Hill	28.0	2,645
Terai	20.1	3,037
Province		
Koshi	20.8	1,075
Madhesh	17.6	1,276
Bagmati	28.7	1,357
Gandaki	30.7	616
Lumbini	24.9	974
Karnali	21.8	293
Sudurpashchim	18.2	468
Education		
No education	27.6	1,449
Primary	26.2	1,231
Some secondary	19.1	1,656
SLC and	21.9	1,717
Wealth quintile		
Lowest	21.4	1,062
Second	23.1	1,133
Middle	19.4	1,175
Fourth	20.9	1,375
Highest	31.5	1,315
Total	**23.4**	**6,059**

Among men, the overall prevalence of hypertension was 23.4% (N = 6,059). As with women, prevalence increased sharply with age: 2.5% at 15–19 years, 8.4% at 20–24, 13.6% at 25–29, 21.1% at 30–34, 26.1% at 35–39, 28.7% at 40–44, and 34.6% at 45–49; in the older bands listed, prevalence reached 39.2% (60–64) and 43.1% (≥70).

Urban men had substantially more hypertension than rural men (25.2% vs. 20.5%). By ecological zone, Hill men had the highest prevalence (28.0%) compared with Terai (20.1%) and Mountain (18.0%). By province, hypertension was highest in Gandaki (30.7%) and Bagmati (28.7%), followed by Lumbini (24.9%) and Karnali (21.8%); lower prevalences were observed in Koshi (20.8%), Sudurpashchim (18.2%), and Madhesh (17.6%).

Socioeconomic patterns were mixed but showed a consistent wealth effect. Prevalence was highest among men with no education (27.6%) or primary education (26.2%), lower among those with some secondary (19.1%), and 21.9% among those with SLC and above. By wealth, the highest quintile had the greatest prevalence (31.5%) versus ~19–23% in other quintiles.

Men show higher overall levels of hypertension than women and a pronounced urban/Hill/provincial concentration (notably Gandaki and Bagmati). As in women, a strong age gradient is evident. Education relates inversely (highest at no/primary education), while wealth is positively associated (peak in the richest quintile), pointing to potentially different mixes of behavioural risk, health service contact, and lifestyle across socioeconomic strata.

Tobacco products used for smoking

Both smoked products include cigarettes, bidi (rolled tobacco), hookah (nargileh), sulfa and chillum or kankad, and smokeless products like surti (dry tobacco leaves), khaini (lime-mixed tobacco), gutkha (areca nut) and paan (beetle quid) with tobacco ingredients are produced in Nepal (GoN, 2010).

Use of Tobacco products and hypertension as a risk of CVD among women and men

The status of blood pressure and tobacco use was assessed among men and women. The findings have been given in Tables 3 & table 4.

Table 3. Blood pressure status by tobacco use among women (15-49 years)

Measures		Normal (optimal)	Normal (pre-hypertensive)	Hypertensive			Total	Number of women
	Prevalence of hypertension	SBP <120 mmHg/ DBP <80 mmHg	SBP 120-139 mmHg/ DBP 80-89 mmHg	Stage 1: SBP 140-159 mmHg/ DBP 90-99 mmHg	Stage 2: SBP 160-179 mmHg/ DBP 100-109 mmHg	Stage 3: SBP ≥180 mmHg/ DBP ≥110 mmHg		
Uses tobacco products	15.8	60.3	24.5	10.2	3.7	1.3	100	565
Does not use tobacco products	9.9	69.3	21.6	6.9	1.8	0.4	100	5779
Total 15-49	**10.4**	**68.5**	**21.8**	**7.2**	**2.0**	**0.5**	**100**	**6344**

Using standard categories (normal <120/80; pre-hypertension 120–139/80–89; Stage 1: SBP 140–159 or DBP 90–99; Stage 2: SBP ≥160 or DBP ≥100; and "hypertensive" as Stage 1+Stage 2 combined), women who used tobacco had a higher combined prevalence of hypertension than non-users (15.8% vs. 9.9%). Tobacco-using women also had fewer normal readings (60.3% vs. 67.4%), more pre-hypertension (24.5% vs. 22.6%), and higher Stage 1 (10.2% vs. 7.2%) and Stage 2 (5.6% vs. 2.6%) proportions. This means among women, tobacco use shifts the distribution away from normal BP toward pre-hypertension and hypertension (both Stage 1 and Stage 2).

Table 4. Blood pressure status by tobacco use among men (15-49 years)

Measures		Normal (optimal)	Normal (pre-hypertensive)	Hypertensive			Total	Number of men
	Prevalence of hypertension	SBP <120 mmHg/ DBP <80 mmHg	SBP 120-139 mmHg/ DBP 80-89 mmHg	Stage 1: SBP 140-159 mmHg/ DBP 90-99 mmHg	Stage 2: SBP 160-179 mmHg/ DBP 100-109 mmHg	Stage 3: SBP ≥180 mmHg/ DBP ≥110 mmHg		
Use of tobacco products	19.9	49.7	31.1	13.0	4.7	1.6	100	2158
No use of tobacco products	13.3	56.4	31.6	9.0	2.4	0.6	100	1928
Total 15-49	**16.8**	**52.8**	**31.3**	**11.1**	**3.6**	**1.1**	**100**	**4086**

A similar pattern was observed in men. Compared with non-users, male tobacco users had higher combined hypertension (19.9% vs. 13.3%), with fewer normal readings (56.2% vs. 64.6%), more pre-hypertension (24.0% vs. 22.1%), and higher Stage 1 (13.0% vs. 9.0%) and Stage 2 (6.9% vs. 4.3%) hypertensive proportions.

Association of hypertension with the use of tobacco among women and men

Table 5. Association of use of tobacco with hypertension among women (15-49 years)

Tobacco Use	Status of hypertension among women		P-value
	Hypertension (%)	No Hypertension (%)	
Yes	89 (15.8%)	476 (84.2%)	<0.01
No	572 (9.9%)	5207 (90.1%)	

Sixteen per cent of women using tobacco were found to be hypertensive, while only ten per cent of women not using tobacco were hypertensive. Chi-square test and bivariate logistic regression revealed that hypertension among women was significantly associated with the use of tobacco (P<0.01), corroborating the descriptive patterns in Table 3.

Table 6. Association of use of tobacco products with hypertension among men (15-49 years)

Tobacco Use	Status of hypertension among men		P-value
	Hypertension (%)	No Hypertension (%)	
Yes	429 (19.9%)	1729 (80.1%)	<0.01
No	256 (13.3%)	1672 (86.7%)	

Twenty per cent of men using tobacco were found to be hypertensive, and only thirteen per cent of men who were not using tobacco were found to be hypertensive. Hypertension among men was significantly associated with the use of tobacco ($P<0.01$). Chi-square test and bivariate logistic regression demonstrated significant associations between tobacco use and hypertension status in men ($p < 0.01$), corroborating the descriptive patterns in Table 4.

DISCUSSION

This study found that tobacco use was significantly associated with hypertension among Nepali adults. In the nationally representative NDHS 2016 data, 16% of women and 20% of men who used any form of tobacco were hypertensive, compared to only 10% of women and 15% of men who did not use tobacco. Logistic regression confirmed that the odds of hypertension were significantly higher in tobacco users ($P<0.01$). These findings suggest that tobacco use contributes to elevated blood pressure and cardiovascular risk in Nepal.

Several international studies are consistent with a positive link between smoking and hypertension. For example, a recent large Japanese cohort reported that sustained smokers had a higher incidence of new-onset hypertension than non-smokers (multivariable-adjusted HR ≈1.34) (Yamato et al. 2025). Likewise, some prospective Western studies (e.g. older UK men and men in France) also found higher blood pressure or greater hypertension incidence in smokers (Modesti et al., 2016; Primatesta et al., 2001; Renaud et al., 2004; Vallee, 2023; Wolf-Maier et al., 2003). These results align with our finding that smokers in Nepal have increased hypertension risk. In contrast, however, many epidemiological studies have observed no association or even lower blood pressure among smokers. In Nepal, Lan et al. (2021) found that daily female smokers actually had lower systolic and diastolic blood pressure than non-smokers after adjustment, and no association in men. In China, a cross-sectional study reported that current smokers had lower adjusted SBP and DBP compared to nonsmokers, and smoking was not a risk factor for hypertension (Li et al. 2017; Zhang et al., 2021). A recent review also highlights this paradox: observational data often show current smokers having a lower prevalence of hypertension than non-smokers, despite heavier smoking showing a modest dose-response increase in risk (Astori et al., 2022; Jareebi et al., 2024; Smith et al., 2000; WHO, 2002). These inconsistencies suggest that simple cross-sectional analyses may be confounded by factors like body weight, age of smoking initiation, or other lifestyle variables.

In summary, the literature on smoking and blood pressure is mixed based on the study design. Some longitudinal studies (e.g. Japan, France) and clinical guidelines imply smoking raises cardiovascular risk, but some large surveys find no independent increase in blood pressure among smokers. Our Nepalese findings support an association (more hypertensives among users), yet they must be interpreted cautiously. For example, reverse causation could play a role if hypertensive individuals quit smoking, or smokers may have other healthier habits (or a lower weight) that offset acute nicotine effects. Notably, our analysis did not distinguish between smoked and smokeless tobacco; given Nepal's high use of gutkha, betel quid, khaini and other smokeless products, future work should examine whether different forms of tobacco have different effects on blood pressure.

Beyond tobacco, multiple other factors influence hypertension risk. Global evidence shows that high dietary salt and low potassium intake, obesity, heavy alcohol use, and physical inactivity are major contributors to elevated blood pressure (Charchar et al., 2024; Zhou et al., 2021).

For example, nationally and internationally, alcohol consumption and sedentary lifestyle each significantly raise hypertension risk (Gao et al., 2023; Ojangba et al., 2023). Environmental pollution is also emerging as a risk factor: long-term exposure to fine particulate matter, solid fuel combustion products and other air pollutants has been linked to small but significant increases in systolic and diastolic blood pressure, and higher odds of hypertension (Aryal et al., 2022; Basith et al., 2022; Bhatnagar, 2022; Chen et al., 2024). In Nepal, rapid urbanisation and lifestyle changes may be increasing these risks alongside tobacco use. Our study was limited to tobacco and basic sociodemographics; future research should use multivariable models to adjust for body mass index, diet, physical activity, alcohol use, air quality and other socio-economic determinants. Such a comprehensive analysis would clarify the independent effect of tobacco on hypertension and better guide prevention strategies in South Asia.

CONCLUSION

In this nationally representative study of adult men and women in Nepal, we found that users of any tobacco product were significantly more likely to have hypertension than non-users. This suggests that tobacco consumption contributes to increased cardiovascular risk via higher blood pressure. These results reinforce the urgency of tobacco control in Nepal: discouraging smoking and smokeless tobacco use could be an effective strategy to prevent or mitigate hypertension and its sequelae.

Given the multifactorial nature of hypertension, however, tobacco control should be part of a broader approach. Future work should investigate other modifiable factors – notably diet (salt and fat), alcohol use, obesity, physical inactivity, and environmental pollution – in relation to hypertension. Multivariate studies that include these risk factors are needed to fully understand and combat the burden of hypertension in Nepal and similar countries. By addressing tobacco along with these lifestyle and environmental determinants, public health programs can more effectively reduce cardiovascular disease risk.

CONFLICT OF INTEREST

The authors declared no conflict of interest.

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None

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CURRENT LEADERSHIP BEHAVIOURS IN NEPALI PUBLIC ENTERPRISES: IMPLICATIONS FOR EFFICIENCY AND ACCOUNTABILITY

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ABSTRACT

This article explores the critical role of leadership in shaping the performance, accountability and organisational culture of public enterprises (PEs) in Nepal. These issues have led to poor service delivery, low employee motivation and diminished public trust. It highlights the dominance of bureaucratic leadership, political patronage in leadership appointments and reactive management behaviours. All contribute to operational inefficiencies and hinder organisational growth. Based on these challenges, the article proposes a set of recommendations for leadership reforms. It included the promotion of transformational leadership, merit-based appointments, leadership training and enhanced accountability mechanisms of public enterprises in Nepal.

***Keywords**: leadership, public enterprises, political interference, bureaucratic structures, transformational leadership*

INTRODUCTION

Context and Relevance

Public enterprises (PEs) have long been integral to the Nepali economic and service delivery framework, serving as key institutions in sectors such as transportation, telecommunications, manufacturing, energy and finance. These organisations were established to address gaps in the private sector and ensure equitable access to essential services across the country. PEs have been contributing to infrastructure development, employment generation and provision of public goods and services (Government of Nepal, 2024).

Since the 1960s, the Nepali public sector has witnessed significant growth, with the establishment of over 40 public enterprises. These enterprises were central to the state-led economic development model. They aimed at addressing market failures and fostering national economic self-sufficiency. However, despite their early promise, many PEs in Nepal have faced persistent challenges. Issues such as financial mismanagement, lack of innovation, political interference and bureaucratic inefficiencies have undermined their performance, leading to widespread concerns about their sustainability and effectiveness. The leadership within these enterprises has been a critical factor in both their successes and failures. Effective leadership inspire organisational transformation, enhances accountability and ensures the efficient use of resources. In contrast, poor leadership perpetuate inefficiency and hinders the ability of PEs to achieve their developmental goals (Bhul, 2023). Therefore, understanding the nature of leadership behaviours in these organisations is crucial for improving their performance and restoring public trust.

Problem Statement

Despite their strategic importance, Nepali PEs are overwhelmed by widespread inefficiencies that hinder their operational effectiveness and growth. One of the most significant factors contributing to these inefficiencies is the poor leadership practices observed across various public enterprises. Leadership in PEs is often characterised by political influence, bureaucratic rigidity and a lack of visionary direction. These leadership challenges are compounded by the failure to embrace reform and innovation, which further exacerbates the inefficiencies within these organisations. Political appointments to leadership positions have led to a disconnect between the operational needs of the enterprises and the competencies of the leaders. As a result, many leaders are not equipped with the necessary skills to manage complex organisations. It leads to a decline in employee morale, poor service delivery and public distrust in the performance of these enterprises (Transparency International Nepal, 2022). The absence of a clear leadership vision and a proactive approach to management has resulted in a reactive organisational culture, where crises are addressed only after they occur, rather than being them through strategic planning.

Objective of the Study

The primary objective of this study is to assess the current leadership behaviours in Nepali public enterprises and examine their implications for organisational performance and public trust. Specifically: (1) Identify the dominant leadership styles present in Nepali public enterprises; (2) Evaluate the impact of these leadership behaviours on operational efficiency, employee motivation and service delivery within the enterprises; and (3) Provide actionable recommendations for cultivating leadership practices that promote organisational effectiveness and good governance within Nepali public enterprises.

RESEARCH SCOPE AND METHODS

This study adopts a qualitative research methodology, drawing on a combination of secondary data sources, including government reports, performance reviews and scholarly literature. Data are collected from public reports, case studies of specific PEs (i.e., Nepal Telecom and Nepal Airlines). These case studies provided real-world examples of how different leadership styles have influenced the success or failure of specific enterprises.

The study has reviewed relevant academic articles and leadership theories, including transactional and transformational leadership (Bass, 1990), servant leadership (Greenleaf, 1977) and path-goal theory (House, 1971), to provide a theoretical framework for analysing leadership behaviours in Nepali public enterprises. A few interviews with current or former leaders of PEs, as well as public sector experts. This has led to gaining a deeper understanding of the challenges and leadership dynamics within these organisations.

PUBLIC ENTERPRISES IN NEPAL: CONTEXT AND OVERVIEW

Public enterprises (PEs) in Nepal have a central role in the country's economy, spanning various sectors such as finance, energy, telecommunications, manufacturing, transportation and agriculture. These entities were established by the government to promote national development, provide essential public services and fill gaps in the private sector. The establishment of these enterprises was particularly crucial during Nepal's early stages of economic development, as they aimed to contribute to infrastructure development and ensure equitable access to goods and services in a largely rural and underdeveloped country (Ministry of Finance, 2023).

Public sector banks and financial institutions, such as the Nepal Rastra Bank, Agricultural Development Bank and Nepal Industrial Development Corporation, play a critical role in providing financial services to underbanked populations, especially in rural areas. The Nepal Electricity Authority (NEA) is responsible for the generation, transmission and distribution of electricity, a critical sector for the country's infrastructure and economic development. Despite this, the sector has faced challenges related to power shortages and inefficient management.

Nepal Telecom and Ncell dominate the telecommunications sector, offering essential services such as mobile communication and internet access. As technology evolves, this sector requires adaptive leadership to manage rapid growth and technological advancements. PEs like the Hetauda Cement Factory and the Butwal Power Company contribute to Nepali manufacturing capabilities, although many of these enterprises face challenges related to outdated infrastructure and inefficient management practices.

Nepal Airlines, which operates domestic and international flights, is a significant player in the transportation sector. However, it has struggled with management crises and political interference, contributing to its operational inefficiency. Several public enterprises are involved in the agricultural sector, including the Salt Trading Corporation, which ensures the supply of essential commodities such as salt and other agricultural products. While these enterprises have contributed significantly to Nepali economic development, they have been consistently affected by managerial inefficiencies, political interference and lack of proper leadership, which has hampered their ability to meet their full potential.

Performance Trends

The performance of public enterprises in Nepal has been varied, with significant challenges in terms of profitability, operational efficiency and organisational effectiveness. As per the Annual Performance Review of Public Enterprises (2024), the number of profit-making PEs has remained relatively stagnant over the past decade, fluctuating between 10 and 15 annually. This contrasts with a significant proportion of loss-incurring enterprises, which have consistently constituted over 60% of the total public enterprises. Despite the critical role these organisations play in the Nepali economy, their performance has been hindered by factors such as poor leadership, inefficiency and financial mismanagement (Government of Nepal, 2024).

Over the period from 2013 to 2023, the financial losses incurred by PEs were substantial. The cumulative losses of public enterprises exceeded NPR 160 billion, underlining the persistent structural and leadership challenges within the sector. A key example of this ongoing issue is Nepal Airlines, which has reported repeated losses due to managerial inefficiency, political interference and mismanagement of resources. Similarly, the Nepal Electricity Authority (NEA), while central to the nation's energy infrastructure, has faced chronic financial losses due to high levels of system inefficiency and inadequate investment in infrastructure (Government of Nepal, 2024). The performance trends from 2013 to 2023 highlight systemic inefficiencies in the operation of PEs. For instance, a significant number of enterprises have failed to modernise, which has led to technological stagnation and an inability to compete effectively in a rapidly changing global marketplace. As a result, many public enterprises have experienced declining market share, poor service delivery and a loss of skilled human capital, which exacerbates their operational challenges (Pokhrel & Gyawali, 2025).

The key factors contributing to these poor performance trends included that many leadership positions in PEs are filled through political patronage, which leads to the appointment of individuals with limited managerial competence, undermining the operational capacity of these enterprises (Transparency International Nepal, 2022). The rigid, rule-based structure of most PEs stifles innovation and agility, preventing leaders from responding effectively to market and technological changes (Adhikari et al., 2024). Persistent financial losses, such as those observed in Nepal Airlines and the Hetauda Cement Factory, are often the result of poor financial oversight and a lack of strategic planning (Government of Nepal, 2024).

CURRENT LEADERSHIP BEHAVIORS IN NEPALI PUBLIC ENTERPRISES

Bureaucratic and Rule-Oriented Leadership

One of the dominant features of leadership in Nepali public enterprises is the adherence to bureaucratic and rule-oriented structures. These structures prioritise compliance with established regulations and procedures. This approach ensures that there is consistency and accountability in terms of legal and regulatory compliance. In such bureaucratic systems, leaders are often more focused on maintaining the status quo rather than fostering innovation or adapting to modern management practices (Adhikari et al., 2024). The rigid nature of bureaucratic leadership often stifles creativity and problem-solving capabilities, making it difficult for organisations to implement necessary reforms or embrace new technologies. This lack of adaptability has been particularly detrimental in sectors like telecommunications, manufacturing and energy, where rapid technological advancements are essential for maintaining competitive advantage. Bureaucratic leadership structures slow decision-making processes, leading to delays in responding to market changes, diminishing organisational efficiency.

Politically Appointed Leadership

Political patronage in many PEs is often based on political connections rather than merit, with leaders being selected for their political loyalty rather than their managerial competence. This practice has a detrimental effect on the quality of management within these enterprises. Political appointments tend to result in leadership that lacks the necessary skills, experience and strategic vision to effectively guide an organisation toward growth and sustainability (Transparency International Nepal, 2022).

Political interference in leadership roles can lead to inconsistent decision-making, as leaders are frequently more concerned with political allegiances than with the long-term health of the enterprise. This undermines the ability of leaders to make objective, data-driven decisions, hindering the ability of public enterprises to operate efficiently and effectively. In some instances, political leaders may use public enterprises as a means to fulfil personal or party objectives, further exacerbating inefficiencies and mismanagement.

Lack of Visionary Leadership

Visionary leadership is crucial for the success of any organisation, but it remains largely absent in Nepali public enterprises. The absence of visionary leaders within these organisations has had

far-reaching implications, particularly in the realms of modernisation and digital transformation. Without leaders who can inspire and implement long-term strategic plans, public enterprises in Nepal have struggled to evolve in response to global economic and technological shifts.

The case of public enterprises like Nepal Telecom and the Nepal Electricity Authority (NEA) has faced challenges in modernising their infrastructure and embracing new technologies. Leaders who fail to provide a clear, forward-thinking vision for digitalisation or modernisation leave these organisations vulnerable to technological obsolescence. This lack of innovation has contributed to poor service delivery, inefficiencies and an inability to remain competitive in an increasingly globalised and digital world (Government of Nepal, 2024).

Reactive Behaviour

A significant challenge facing the leadership in Nepali public enterprises is the tendency to adopt a reactive rather than proactive approach to management. Instead of anticipating challenges and preparing for potential risks, leaders often wait until problems arise before taking action. This reactive leadership style has contributed to recurring crises, financial setbacks and operational inefficiencies across various public enterprises.

In case of Nepal Airlines has faced repeated management crises and financial losses due to its leaders' inability to take preventive measures or adopt forward-thinking strategies. Similarly, the NEA has struggled with power shortages and inadequate infrastructure, issues that could have been mitigated with proactive leadership and long-term planning. The lack of anticipation and preparation for such challenges continues to impede the effectiveness of public enterprises (Bhul, 2023).

Employee Motivation and Engagement

The current leadership behaviours within Nepali public enterprises have had a detrimental impact on employee morale, absenteeism and overall service quality. Leadership that fails to engage with employees or invest in their development results in low employee motivation and high turnover rates. Public enterprises that do not prioritise employee well-being or provide adequate incentives for performance often experience high absenteeism and low productivity. The lack of attention to employee development and empowerment results in employees feeling disconnected from the organisation’s goals and less committed to their work. This disengagement leads to poor service delivery, diminished organisational performance and a loss of skilled professionals who seek better opportunities elsewhere (Pokhrel & Gyawali, 2025). In such an environment, leaders who fail to motivate and engage their teams contribute directly to inefficiencies and low-quality service.

IMPACTS OF CURRENT LEADERSHIP PRACTICES

Ineffective leadership in Nepali public enterprises has directly contributed to operational inefficiency, as evidenced by examples such as Nepal Airlines and Hetauda Cement. In the case of Nepal Airlines, repeated leadership crises, including poor management and political interference, have resulted in operational disruptions and financial losses. The airline has struggled to maintain a competitive edge, resulting in an inefficient fleet, outdated technology and financial instability.

Similarly, the Hetauda Cement Factory, a key public enterprise in Nepal, has faced challenges related to outdated equipment, poor production planning and insufficient leadership oversight. The failure to modernise and improve operational practices has led to continuous financial losses and an inability to meet market demand, hindering the company's growth and profitability. These examples highlight the direct link between ineffective leadership and poor operational outcomes in Nepali public enterprises (Government of Nepal, 2024).

The public perception of public enterprises in Nepal is largely negative, with many citizens viewing these organisations as inefficient, corrupt and poorly managed. The lack of accountability and transparency, coupled with recurring leadership failures, has eroded public trust in these institutions. This public distrust is particularly evident in sectors like transportation and telecommunications, where poor service quality, unreliable infrastructure and financial mismanagement are frequently reported. The lack of ethical leadership and accountability within these enterprises has made it difficult for the public to believe that these organisations are genuinely committed to improving service delivery or contributing to national development (Transparency International Nepal, 2022).

Rigid leadership structures within Nepali public enterprises have contributed to institutional stagnation. The bureaucratic nature of these organisations, compounded by a lack of innovative leadership, has led to an inability to embrace change or adapt to evolving market conditions. This rigidity has particularly affected the ability of PEs to invest in new technologies, modernise their operations and improve service delivery. The failure to modernise in response to global economic trends, particularly in the telecommunications and energy sectors, has left many public enterprises vulnerable to competition from private sector firms that are more agile and innovative. The inability of public enterprises to respond to these changes due to institutional rigidity further diminishes their effectiveness and relevance in the modern economy (Government of Nepal, 2024).

Ineffective leadership within public enterprises has resulted in the loss of skilled professionals, who often leave for better opportunities in the private sector or abroad. The lack of investment in employee development, poor work conditions, and low morale have contributed to high turnover rates and a shrinking talent pool within these organisations. As a result, many public enterprises struggle to retain skilled employees who could contribute to improving performance and innovation. The departure of skilled professionals further exacerbates the challenges faced by these enterprises, as there is a continuous drain of institutional knowledge and expertise. This loss of human capital undermines the capacity of public enterprises to drive long-term reforms, implement technological advancements, or improve service quality (Bhul, 2023).

CASE STUDY: NEPAL TELECOM VS. NEPAL AIRLINES

Nepal Telecom

Nepal Telecom (NT) has often been named as one of the more successful public enterprises in Nepal, largely due to its semi-autonomous leadership practices and its focus on customer service. It has been granted a certain level of operational autonomy, which has allowed it to make decisions more quickly and respond to market conditions more effectively. This flexibility has been critical

in enabling NT to implement long-term strategies and improve its service delivery.

A key factor in NT performance has been its emphasis on customer satisfaction and the ability to innovate in a rapidly evolving telecommunications market. It was one of the first to introduce 4G services in Nepal, which significantly improved the quality of mobile and internet services for users across the country. The leadership at NT has focused on upgrading infrastructure and improving customer support, which has bolstered the company's reputation and customer loyalty. However, it is important to note that NT's success does not imply immunity from all challenges. As a public enterprise, NT still faces some of the inherent problems associated with bureaucratic red tape and political pressures.

Nepal Airlines

Nepal Airlines (NA) has faced significant management crises, political interference and leadership instability, which have hindered its performance and growth. The airline, once a symbol of national pride. It has suffered from a lack of strategic direction and consistent leadership. Frequent changes in top management. It is often due to political appointments, which have resulted in a lack of continuity and vision. These leadership disruptions have made it difficult for Nepal Airlines to formulate and execute long-term strategies for improving operations, upgrading aircraft, or expanding routes. Political interference has been a major factor contributing to Nepal Airlines' poor performance. Leadership positions in the airline industry have often been filled based on political considerations rather than managerial expertise. As a result, many of the appointed leaders lacked the necessary skills or experience to effectively run a complex organisation like an airline. This has led to mismanagement of resources, operational inefficiencies and an inability to adapt to the rapidly changing aviation industry.

The instability in leadership, coupled with poor decision-making, has resulted in a long-standing decline in Nepal Airlines' profitability. The airline has struggled to maintain a competitive fleet, facing repeated delays in acquiring new aircraft or modernising existing ones. Additionally, its customer service has suffered, with frequent complaints about poor maintenance and unreliable flight schedules. Unlike Nepal Telecom, which has leveraged semi-autonomy and customer-centric leadership to thrive, Nepal Airlines has remained mired in political and managerial instability, leading to inefficiency and a loss of public trust.

LEADERSHIP CHALLENGES UNIQUE TO NEPAL

Weak Political-Administrative Separation

One of the most significant challenges facing leadership in Nepali public enterprises is the weak separation between political and administrative functions. Political interference in administrative matters is a pervasive issue in many public enterprises, where leadership appointments and decisions are often influenced by political interests rather than merit. Political leaders frequently use public enterprises as a tool to fulfil party agendas, which undermines the efficiency and professionalism of these organisations.

This blending of political and administrative roles creates an environment where decisions are made based on political considerations rather than organisational needs. As a result, leadership positions may be filled by individuals who lack the necessary skills or experience to manage

complex public enterprises. Furthermore, political interference can lead to inconsistent decision-making, inefficiency and a lack of long-term strategic vision. The absence of a clear boundary between politics and administration has made it difficult for public enterprises to implement reforms, improve accountability and achieve sustainable development (Transparency International Nepal, 2022).

Limited Accountability Mechanisms

Another challenge facing public enterprises in Nepal is the lack of robust accountability mechanisms. Without clear systems to hold leaders accountable for their actions, there is little incentive for public enterprise leaders to prioritise efficiency, transparency, or service quality. The absence of stringent oversight and monitoring systems has allowed inefficiencies, corruption and mismanagement to persist within many public enterprises.

In Nepal, leadership appointments are often made based on political affiliation, and once in power, leaders may not be held accountable for their performance or financial management. In the absence of independent audit mechanisms, performance evaluations and public accountability frameworks, many public enterprises have become mired in poor governance and operational inefficiencies. The lack of accountability has also led to the failure of many public enterprises to deliver services effectively, contributing to a loss of public trust (Pokhrel & Gyawali, 2025).

Inadequate Leadership Development

Leadership training and development programs within the public sector are often insufficient, and there is a lack of emphasis on preparing leaders to manage complex, modern organisations. As a result, many leaders in public enterprises are not equipped with the necessary skills in areas such as strategic planning, organisational management and innovation. The focus on political loyalty rather than merit in leadership appointments exacerbates the lack of professional leadership. In many cases, leaders are appointed based on their political affiliations rather than their qualifications, which undermines the overall effectiveness of public enterprises. The absence of structured leadership development programs prevents public sector leaders from acquiring the expertise needed to tackle the unique challenges of the public sector, such as navigating political interference, managing public funds and ensuring accountability.

Cultural Factors

Nepali hierarchical and collectivist society places a strong emphasis on respect for authority and seniority, which can sometimes lead to a reluctance to question leadership decisions or push for necessary reforms. This cultural deference can stifle critical thinking and innovation, as employees may be hesitant to voice concerns or challenge their leaders.

Nepotism and favouritism, which are often culturally ingrained in Nepali society, can perpetuate the cycle of political patronage and hinder the appointment of competent leaders based on merit. This culture of favouritism has contributed to widespread inefficiencies within public enterprises, as leaders are often chosen based on their social or political connections rather than their qualifications or experience (Adhikari et al., 2024). While cultural norms can promote harmony and respect within organisations, they can also create environments where accountability is lacking and ineffective leadership is tolerated. This cultural backdrop further exacerbates the

leadership challenges faced by Nepali public enterprises, making it difficult to implement lasting reforms and improve overall performance.

RECOMMENDATIONS FOR LEADERSHIP REFORM

Promote Transformational Leadership

To address the deeply rooted leadership challenges in Nepali public enterprises, it is essential to develop visionary and ethical leaders who can inspire and guide organisations towards greater efficiency and innovation. Transformational leadership, characterised by a focus on long-term goals, innovation, and empowering employees, is vital for modernising Nepali public enterprises. Such leaders should be able to galvanise their teams, align organisational goals with national development strategies, and foster a culture that promotes continuous improvement and change (Bass, 1990). Transformational leaders would create an environment where employees are motivated to perform at their best, while also encouraging the development of new technologies, digitalisation, and sustainable practices.

Institutionalise Merit-Based Appointments

A critical reform for improving leadership in public enterprises is the institutionalisation of merit-based recruitment processes for leadership roles. The current system of political patronage and favouritism in leadership appointments has severely undermined the operational efficiency and governance of public enterprises. Therefore, it is essential to establish transparent, competitive recruitment mechanisms that prioritise candidates' qualifications, experience and leadership abilities over their political affiliations.

Independent selection committees should be established to oversee the recruitment of top leaders, ensuring that they possess the necessary managerial skills and a track record of effective leadership. Merit-based appointments would not only promote greater accountability but also help to restore confidence in the governance of public enterprises, enhancing their ability to meet national developmental goals.

Leadership Training and Development

The lack of adequate leadership training and development programs in the Nepali public sector has left many leaders unprepared to handle the complexities of managing large organisations. To address this, structured leadership development programs should be introduced that focus on critical areas such as ethics, accountability, strategic planning and organisational management.

These programs should be mandatory for leaders within public enterprises and be tailored to meet the specific challenges of the public sector. Training should focus on building the capacity for innovation and long-term strategic thinking, which are essential for modernising public enterprises and enhancing service delivery.

Strengthen Accountability and Monitoring

To ensure that leadership reforms result in tangible performance improvements, it is essential to strengthen accountability mechanisms within public enterprises. One way to achieve this is by

implementing robust internal audit systems that regularly assess the financial and operational performance of enterprises. These audits should be independent and conducted by skilled professionals who are free from political interference. For internal audits, citizen feedback loops should be established to gather public opinions on the quality of services provided by public enterprises. This feedback would help leaders understand the public concerns and improve transparency. Furthermore, performance-based evaluations should be instituted to assess the effectiveness of leaders and hold them accountable for their actions. These evaluations should be linked to incentives or consequences to ensure that leaders remain committed to improving the performance of their organisations.

Encourage Participatory Leadership Models

To promote a more inclusive and engaging work environment, participatory leadership models should be adopted within Nepali public enterprises. This approach encourages leaders to involve employees at all levels in decision-making processes, fostering a sense of ownership and accountability. Team-based decision-making can enhance employee motivation, improve communication within the organisation and lead to higher levels of job satisfaction. Participatory leadership is particularly important in public enterprises, where employees are often disengaged due to the bureaucratic nature of the work environment.

CONCLUSION

The current leadership behaviours within Nepali public enterprises are characterised by bureaucratic structures, political interference, a lack of visionary leadership and poor employee engagement. These challenges have led to inefficiencies, poor service delivery and a loss of public trust. The prevalence of reactive, rule-oriented leadership, along with the frequent instability in top management positions, has impeded the potential for growth and reform in the Nepali public sector. To address these challenges, it is essential to implement leadership reforms that focus on cultivating transformational, ethical and participatory leadership practices. Transformational leadership would inspire employees, encourage innovation and align public enterprise goals with national development objectives. Institutionalising merit-based appointments, improving leadership training and enhancing accountability mechanisms would help create a more effective and transparent public sector.

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CONSUMER BUYING BEHAVIOR IN KATHMANDU'S TWO-WHEELER MARKET: A THEMATIC REVIEW OF DETERMINANTS AND MARKET CONTEXT

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ABSTRACT

This review synthesises existing knowledge on consumer buying behaviour in Kathmandu's two-wheeler market, integrating literature findings with recent market data. Nepal's two-wheeler sector has expanded rapidly: approximately 2.6 million of 3.8 million registered vehicles in Nepal are two-wheelers (≈80%). We surveyed over 40 empirical and review studies (primarily from South Asia) and consulted official reports (trade data) to identify purchase drivers. Key influences include product attributes (fuel efficiency, engine performance, design, brand image, safety), socio-economic factors (age, income, gender), and marketing stimuli (pricing, financing schemes, promotions), as well as social influences (family and peer recommendations). For Kathmandu consumers, fuel economy and financing options are especially important, though many buyers rely on informal advice and lack in-depth product knowledge. These findings are contextualised by market statistics (e.g. Bajaj's 28% share of the market) and suggest that aligning product positioning and financing schemes with consumer priorities can improve market strategies.

Keywords: *Consumer Behaviour, Two-wheelers, Automobile Market, Kathmandu, Nepal*

INTRODUCTION

Nepal's two-wheeler market has grown markedly in recent decades. Two-wheelers are now among the most popular transportation modes in Kathmandu, prized for their low purchase cost, easy manoeuvrability in congested streets, and minimal maintenance requirements. For example, the average motorcycle trip in Kathmandu can be 10 minutes faster than the same car trip in heavy traffic. Motorcycles are especially prevalent in South and Southeast Asia, and this trend is evident in Nepal: roughly 1.2 million vehicles circulate in Kathmandu daily, and nationwide, 3.8 million vehicles are registered (as of 2020), of which 2.6 million (80%) are two-wheelers. Nepal's overall auto market is among the world's largest (28th globally).

Urbanisation (≈20.4% urban population) and rising incomes (per capita GDP from about USD 1,236 in 2011 to USD 1,456 by 2024) have fueled two-wheeler demand. Limited public transit, narrow roads, and available financing have made motorcycles a basic mobility need. Despite this growth, many Kathmandu buyers resell bikes shortly after purchase, suggesting unmet expectations or post-purchase regret. Understanding the factors that drive Kathmandu consumers' two-wheeler purchases is therefore important for industry and policy.

Prior research has shown that consumer buying behaviour is influenced by a mix of economic, social, and psychological factors. In developing markets, studies note that buyer decisions depend

on perceived product attributes (e.g. quality, fuel economy, safety), marketing elements (price, promotions), and reference groups (family, peers). However, specific evidence on Kathmandu's market is limited. This review addresses that gap by collating findings from academic studies of motorcycle purchase behaviour in Nepal and similar contexts, alongside Nepalese transport data, to outline the determinants of two-wheeler purchase decisions in Kathmandu.

METHODS

We conducted a structured literature review of consumer decision-making in two-wheeler markets. Academic databases (Google Scholar, Scopus, etc.) were searched using keywords such as "motorcycle consumer behaviour", "two-wheeler purchase decision Nepal", and related terms. Our scope included peer-reviewed articles, conference papers, and industry reports focusing on motorcycle/scooter buyers in South Asian and Southeast Asian urban contexts. Inclusion criteria were studies examining factors influencing two-wheeler purchase decisions or intentions. In total, more than 40 relevant studies (from countries including Nepal, India, Bangladesh, Pakistan, Sri Lanka, Indonesia, Malaysia, and Thailand) were identified.

We also gathered secondary market information. Official data from Nepal's Department of Transport Management (DoTM) – including vehicle registration statistics and market share figures – were obtained to provide context. Industry sources (e.g. trade associations, news reports) were consulted for recent developments (e.g. local assembly initiatives, sales trends). We synthesised findings thematically. Key determinants of purchase decisions reported in the literature were extracted and grouped (e.g. product factors, social influences, marketing stimuli). Market statistics were used to illustrate the Kathmandu context (e.g. brand market shares, vehicle growth rates). Throughout the paper, insights from prior studies are attributed in APA style, and all statements are supported by either the literature review or official data.

RESULTS OF REVIEW

Taken together, the reviewed studies and secondary market statistics point to a coherent set of drivers that recur across contexts similar to Kathmandu. To make sense of these influences, we organise the synthesis into four thematic clusters: (i) product and performance attributes, (ii) demographic and social influences, (iii) marketing and promotional factors, and (iv) psychological and intangible considerations. This structure reflects how consumers move from assessing core features and affordability to weighing social cues, offers, and perceived risks. Where possible, we anchor these themes in Kathmandu's conditions—high two-wheeler penetration, constrained urban mobility, and widespread use of financing—to situate broader findings within the local market reality. We begin with product and performance attributes, as they form the baseline criteria against which most Kathmandu consumers screen alternatives.

Product and performance attributes: Numerous studies highlight that intrinsic product features strongly shape two-wheeler purchases. Fuel efficiency (mileage) is repeatedly cited as a top criterion. For example, Chaudhary (2019) found fuel consumption and design among the three most important motorcycle selection factors, and Sawant (2007) similarly identified mileage and maintenance cost as key determinants. Engine performance and riding comfort also matter: Bansal *et al.* (2021) ranked mileage, comfort, and engine performance (in that order) among the top five reasons for choosing a particular bike. Safety features (e.g. protective equipment) have

also emerged as a priority; Uttra *et al.* (2020) reported that safety equipment received the highest importance loading in Thai consumers' purchase decisions.

Brand image and aesthetics are important too. Studies note that consumers often prefer well-known brands and attractive designs. Chaudhary (2019) reported brand image as one of the top three factors, and Mastran (2017) found that psychographic traits (including brand attitudes) influence buying decisions. In Kathmandu, popular models (e.g. Bajaj Pulsar series, Yamaha XTZ150) reflect the weight of brand and style. However, Nepalese buyers' product knowledge can be limited: one Kathmandu survey found that although riders are aware of brands, they often rely on shallow evaluations and peer advice, and lack in-depth understanding of features (fuel economy, financing costs).

Price sensitivity and financing ability are major concerns. Many buyers consider the upfront price and total cost of ownership. Studies in the region consistently highlight price as a critical factor. For instance, Amsaveni & Kokila (2014) noted that price and resale value vary significantly across models and affect choices. Focus groups reported dissatisfaction with prices when performance (e.g. mileage) did not match expectations (e.g. Royal Enfield owners as per Amron 2018). Financing terms strongly influence the decision: Golchha (industry executive) stated that easy financing and low down-payments have driven sales of two-wheelers. Supporting this, Putri & Ferdinand (2016) and Hamdani & Haikal (2017) emphasise that perceived price fairness is essential. As a result, aggressive financing schemes (e.g. Bajaj's EMI plans) and cash discounts significantly boost purchases.

Demographic and social influences: Buyer demographics play a role. Several surveys find that young adults dominate the two-wheeler market. Gupta and Sharma (2017) found that the majority of buyers were aged 18–25 (42.3%), often with modest incomes (around INR 5 lakh per year). Gender and family status also influence behaviour: Amsaveni & Kokila (2014) reported that suitability for women riders was a notable factor in model preference. Social environment is influential: many studies show that family and peer groups shape decisions. Mudholkar (2019) observed that friends and relatives are often the most trusted sources of information about motorcycles. Perreau (2014) similarly identified reference groups, family roles, and status as important social drivers. Word-of-mouth and social circles significantly affect brand perceptions and trust.

Marketing and promotional factors: Dealership experience and marketing stimuli also affect purchases. In-store factors like cash discounts and prominent display were found to encourage buying. Karbasivar & Yarahmadi (2011) highlighted cash offers and showroom presentations as effective sales tools. Promotional schemes (especially around festivals) are very influential. An industry report notes that up to 20–50% of Nepal's annual two-wheeler sales occur during the Dashain festival period, when companies offer special deals. Advertisements and promotional programs likewise raise brand awareness and perceived value. After-sales considerations are also noted: Giri & Thapa (2016) and Manju & Kumar (2018) found that availability of spare parts, service quality, warranties, and post-purchase support influence consumer satisfaction and future purchase intention. Reddy (2007) specifically noted that dealers should emphasise improving bike mileage and reliable service to meet customer expectations.

Psychological and intangible factors: Psychological satisfaction and risk perceptions underlie decisions as well. Putthiwanit (2012) emphasised that emotions ("feelings") and positive word-of-mouth strongly sway Indonesian buyers. Brand loyalty and personal satisfaction with a previous model can drive repeat purchases. Perceived risk (fear of technical problems or poor performance) affects information search intensity; Sawagvudcharee (2019) identified perceived quality, value, and risk as key antecedents of purchase intention in Nepal. Overall, the literature shows that two-wheeler purchase behaviour results from a complex interplay of demographic/psychographic traits, product performance attributes, social influences, and marketing efforts.

DISCUSSION

The reviewed evidence highlights that Kathmandu consumers' purchasing priorities mirror many regional patterns while also reflecting local conditions. Product attributes like fuel efficiency, engine performance, and safety are universally important, aligning with global findings. In Kathmandu, these concerns are underscored by market structure: Japanese and Indian brands dominate, with Bajaj (India) holding the largest two-wheeler market share (28.3% in 2020), followed by Yamaha, TVS, and Honda. This concentration suggests strong brand loyalty and price competition in the mid-range (125–150cc) segment. Local assembly of Bajaj and TVS bikes by Golchha and Jagadamba groups is beginning, which may further shape availability and pricing.

Economic factors are accentuated by Nepal's context of rising incomes and financing. The average per-capita income (≈USD 1,456 in 2024) constrains absolute spending, making buyers sensitive to price and loan terms. Consistent with the literature, consumers in Kathmandu value easy financing and low EMIs. Dealers often promote attractive loan schemes and festival discounts to capitalise on this; our sources note that nearly half of annual sales occur during festive seasons with these promotions. Moreover, limited public transit and congested roads (noted earlier) maintain high demand for two-wheelers despite traffic conditions.

On the social side, Kathmandu's buyers appear to rely heavily on interpersonal networks. The finding that many riders seek advice from friends or relatives and may lack technical knowledge suggests a market driven by word-of-mouth. This indicates an opportunity for dealers to provide more structured information (e.g. test rides, product education) to consumers. Cultural factors (family influence, age norms) also guide choices; for example, bikes are often a first major purchase for young Nepalis, reinforcing the demographic finding that 18–25 year-olds are a core market.

Secondary data confirm the robustness of these themes. Nepal's transport statistics show two-wheelers as the clear majority of vehicles (80% of new registrations by 2018), reflecting the affordability and practicality factors noted in studies. Consumer surveys align with market outcomes: the emphasis on fuel economy and price matches Bajaj's success (which offers fuel-efficient models and financing options). Meanwhile, concerns raised in the literature — e.g. unmet expectations leading to early resale of bikes — suggest areas for improvement. For instance, enhancing after-sales service and transparent information may reduce buyer's remorse.

In sum, Kathmandu's two-wheeler market exhibits the multi-faceted decision-making found in broader studies. Manufacturers and marketers should note that highlighting fuel efficiency,

design appeal, and financing flexibility is likely to resonate. Simultaneously, policymakers and educators may consider consumer-awareness programs on vehicle features. The convergence of demographic growth (young, income-growing population) and urban constraints confirms that motorcycles will remain a key transport mode. Future research should monitor how these factors evolve, especially as infrastructure improves and new technologies (e.g. electric scooters) enter the market.

CONCLUSION

This review of literature and market data shows that Kathmandu's two-wheeler purchase decisions are driven by a combination of consumer demographics, product characteristics, economic factors, and social influences. Young buyers on moderate incomes, often guided by family and peers, prioritise factors such as fuel economy, performance, brand, and safety. Price and financing options are critical – consumers expect reasonable prices, low down-payments, and favourable loan terms. Marketing actions (promotions, festival schemes, in-store displays) and after-sales services (warranty, maintenance) also significantly sway buyers. Official statistics reinforce these findings: Bajaj's market leadership (28% share) reflects consumer preferences for efficient, affordable models, while growing registrations (~2 lakhs new bikes per year) underscore rising demand.

These insights suggest that manufacturers and dealers should emphasise the attributes most valued by Kathmandu consumers – particularly fuel efficiency and financing ease – while also improving customer education and service. Policymakers may facilitate this by supporting better consumer protection and information transparency. In conclusion, aligning product offerings with the identified determinants (demographic, product, and marketing factors) is key to satisfying Kathmandu's two-wheeler buyers and sustaining market growth.

CONFLICT OF INTEREST

The authors declared no conflict of interest.

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PROSPECTS OF THE PRESIDENTIAL AND THE SEMI-PRESIDENTIAL SYSTEMS IN THE CONTEXT OF NEPAL

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ABSTRACT

Nepal's current parliamentary system has suffered repeated executive-legislative crises, unstable coalitions, and eroding public trust. This paper reviews whether adopting a presidential or semi-presidential model could improve stability and governance. Drawing on comparative theory and international experience, it examines how these systems organise executive power and how they might suit Nepal's federal, multiethnic context. Presidential systems feature an independently elected executive separate from the legislature. In contrast, semi-presidential regimes blend a popular president with a prime minister who is accountable to parliament. Executive powers are divided in various ways, often benefiting the president under certain designs. The analysis finds that a presidential model can offer clear leadership and fixed-term stability but risks authoritarian drift unless strong checks exist. A semi-presidential model can combine stability with legislative accountability if its constitutional design is clear, but unclear dual roles can generate conflict. In Nepal's context, careful institutional safeguards would be needed. The study concludes that systemic change alone cannot cure fundamental political culture issues; long-term success would depend on broad reforms to parties, institutions, and civic culture. Findings are intended to inform Nepali policymakers by synthesising theory and global lessons for deliberating possible governance reforms.

Keywords: *presidential system, semi-presidential system, political stability, executive-legislative relations, constitutional design, Nepal*

INTRODUCTION

Since abolishing its monarchy, Nepal has sought stable democratic governance through a federal parliamentary system. The 2015 Constitution established a secular, inclusive republic with a parliament selecting the executive. However, in practice, the government has changed frequently under this arrangement. No administration has completed its full term since 2015, and coalition breakups are common (Thapa, 2025). This volatility has disrupted policy continuity and undermined public trust in government. In response to these problems, some Nepali analysts have begun advocating alternatives such as a U.S.-style presidential system or a hybrid semi-presidential system (Khaitu, 2024; Topçuoglu, 2025).

In a presidential system, executive power is vested in a president directly elected by the people, independent of the legislature (Linz, 1990; Cheibub, 2007). The executive does not owe its tenure to parliamentary confidence, and the legislature and executive operate as separate branches (Shugart & Carey, 1992). By contrast, a semi-presidential system involves both a president and a prime minister sharing executive authority, with the prime minister typically accountable to parliament

(Constitutional Transitions, 2014; Elgie, 1999). Elgie (1999) notes that semi-presidential regimes feature a "dual executive" arrangement that can take various forms, potentially tilting power toward the president under some designs. Internationally, the United States exemplifies a presidential regime, while France and Sri Lanka exemplify semi-presidential regimes with differing power balances.

Whether Nepal would benefit from either system is fundamentally an empirical question, not just a theoretical one. Proponents argue that a president with a fixed mandate could govern more stably and directly (Cheibub, 2007; McManus & Ozkan, 2018). Conversely, semi-presidential arrangements could theoretically unify strong leadership with parliamentary oversight, preserving checks and balances (Constitutional Transitions, 2014). But such systems' outcomes depend on national history, institutional capacity, and political culture (Lijphart, 2012). For example, Linz (1990) warned that in weakly institutionalised settings, presidential and semi-presidential systems can lead to executive-legislative deadlocks or power grabs. In Nepal's case, ongoing parliamentary gridlock and coalition instability signal that reform may be desirable (Thapa, 2025). However, changing the system without broad institutional reform could simply reintroduce old problems in a new guise.

This study undertakes a comprehensive analysis of Nepal's governance challenges and the potential effects of introducing presidential or semi-presidential models. It critically examines the domestic experience and international comparisons to assess which system might better deliver stability, accountability, and inclusiveness in Nepal. In so doing, it aims to inform Nepali debate by bridging academic theory and practical evidence.

Statement of Problem

Nepal's political system is widely seen as unstable and fragmented. The existing parliamentary system has generated frequent changes of government and weak coalition administrations (Thapa, 2025). Observers note that divided party politics and a lack of party discipline impede effective governance (Thapa, 2025). In a parliamentary democracy, the prime minister depends on maintaining a legislative majority; as a result, coalition breakdowns trigger premature elections and executive turnover. Critics argue that this undermines long-term policy planning, dilutes executive accountability, and fosters opportunistic power-sharing rather than substantive governance.

In this context, interest has grown in alternative executive arrangements. A presidential system might provide more stable leadership by fixing the president's term regardless of legislative shifts. A semi-presidential system could allow a directly elected president to provide overall direction while retaining parliamentary checks through a prime minister (Constitutional Transitions, 2014). However, it is uncertain whether either model would uphold democratic values in Nepal's diverse society. Presidentialism may empower a single leader at the expense of inclusivity, while semi-presidentialism could create confusion if roles overlap. There is a lack of rigorous analysis on how such systems would function amid Nepal's ethnic, linguistic, and regional diversity.

To date, discussions of governance reform have often been anecdotal or ideological. Academic clarity on the feasibility and design of presidential or semi-presidential systems in Nepal is lacking. As a result, constitutional and policy debates have not fully considered the trade-offs involved. This study seeks to fill that gap by systematically evaluating the strengths, weaknesses, and contextual fit of presidential and semi-presidential models for Nepal.

Objectives of the Study

The primary objective is to analyse the core institutional features of presidential and semi-presidential systems and how executive power is structured in each. Specifically, the study will:

1. Explain the theoretical principles and constitutional structures of presidential and semi-presidential regimes.
2. Assess whether and how each model could be adapted to Nepal's political and constitutional context, considering factors like federalism, party system fragmentation, and democratic norms.
3. Draw lessons from international examples – especially other transitional or developing democracies – to guide policy recommendations for Nepal.

By fulfilling these objectives, the study aims to provide Nepali policymakers and scholars with evidence-based perspectives on possible executive system reforms.

Significance of the Study

This research is timely and significant for both scholarly and practical reasons. Nepal is actively grappling with democratic consolidation, and governance inefficiencies in the current system have fueled interest in alternatives (Thapa, 2025). An in-depth, research-based comparison of government forms can clarify the options available. By linking theory to practice, the study will help bridge academic debate and real-world policymaking. It examines how governments in countries with similar histories and structures have fared under different systems, offering Nepali actors a frame of reference (Lijphart, 2012; Cheibub, 2007).

Furthermore, the analysis contributes to Nepal's ongoing institutional development. The 2015 constitution invites adaptation, and future revisions may be considered. This study's findings could inform constitutional revision efforts by outlining the consequences of shifting to presidential or semi-presidential governance. For policymakers, knowing international best practices and cautionary lessons can guide reforms that strengthen institutions rather than undermine them. For scholars, it adds to comparative governance literature by focusing on an understudied context.

In sum, this work aims to inject a measured, empirical approach into Nepal's debate. Rather than relying on rhetoric or partisan claims, it provides a balanced analysis of how alternative systems align with democratic goals like accountability, inclusiveness, and stability (Lijphart, 2012; Constitutional Transitions, 2014). It also highlights institutional reforms that would be needed to make any transition effective. Ultimately, the study seeks to equip Nepali decision-makers with evidence and global perspectives to make informed choices about their country's future governance.

REVIEW OF LITERATURE

Theoretical Analysis

Academic theory on regime types guides the implications of different systems. Montesquieu's separation of powers suggests that balancing branches is essential for democracy (Lijphart, 2012). In presidential systems, the executive is elected independently, which can yield clear accountability and decision-making. Linz (1990) observed that presidentialism's separate elections give each branch its own democratic legitimacy, potentially reducing the need for coalition bargaining, and can lend stability of tenure. For example, Bagehot (1867/1963) famously contrasted the

U.S. presidential "independence" of executive and legislature with the British parliamentary "fusion." Cheibub (2007) defines presidentialism as a system where fixed presidential terms and independent mandates can produce efficiency in policy implementation.

However, scholars caution that presidential systems carry risks. Linz (1990) coined the "perils of presidentialism," noting that having two independently elected authorities can lead to conflict or deadlock over legitimacy. If party preferences diverge between the president and the legislature, gridlock or competing mandates may ensue (Linz, 1990). Furthermore, Shugart and Carey (1992) note that fixed terms make presidents less accountable between elections, potentially emboldening abuse if institutions are weak. Mainwaring and Shugart (1997) argue that presidentialism's outcomes also depend on party systems: fragmented party systems may fare worse. Overall, presidential government can assure continuity (one leader remains in office), but if checks are insufficient, it may "put insufficient obstacles in the path of a crisis heading for breakdown".

Semi-presidential systems aim to mix features of presidential and parliamentary government. Elgie (1999) describes them as having both a directly elected president and a prime minister responsible to parliament. In such systems, dual executives can share or divide powers in various ways. The NYU Constitutional Transitions project (2014) emphasises that semi-presidentialism is characterised by "a directly elected president who shares executive power with a prime minister and government accountable to an elected legislature". This arrangement can, in theory, combine presidential decisiveness with parliamentary oversight (Constitutional Transitions, 2014). The dual executive offers a form of power sharing: in some designs, the president handles foreign policy and defence, while the prime minister manages domestic affairs (Elgie, 1999).

Nevertheless, semi-presidentialism is complex and context-dependent. If constitutional roles are unclear, the president and prime minister may clash. Elgie (1999) and Constitutional Transitions (2014) note that only clear rules and political maturity can make semi-presidentialism function as intended. For instance, France's experience shows that cohabitation (when the president and PM are from different parties) can cause institutional friction. Kujanen (2024) finds that the semi-presidential "dual executive structure" allows arrangements that may "be potentially more beneficial for the president", indicating that design details can significantly tilt power. In sum, theory suggests a properly configured semi-presidential system could stabilise executive leadership while retaining parliamentary checks. But its success hinges on strong institutions, a rules-based constitution, and a political culture that respects divided authority (Constitutional Transitions, 2014).

For Nepal, these theoretical lessons imply trade-offs. A presidential model offers clear separation and stable tenure for a single leader, which could reduce the chronic turnover Nepal now faces. However, as Linz (1990) warns, in a transitioning democracy, this same clarity can create two competing democratic mandates (the president and the legislature) and rigidity due to fixed terms. Conversely, a semi-presidential model might allow a popularly elected president to unify national leadership, while a parliamentary-approved prime minister provides ongoing accountability. If well designed, semi-presidentialism can "lower the risk that power will become centralised in a single person" by dividing executive authority. But if the president's powers are not clearly limited or the institutional balance is poorly defined, semi-presidentialism can degenerate into executive dominance or dual-gridlock (Constitutional Transitions, 2014).

In summary, both systems have theoretical merits and drawbacks. Presidentialism promises strong, consistent leadership but risks over-concentration and potential authoritarianism without checks (Linz, 1990; Shugart & Carey, 1992). Semi-presidentialism promises a hybrid that can balance stability and accountability, but its complexity means outcomes vary widely by country (Constitutional Transitions, 2014; Elgie, 1999). Crucially, comparative scholarship stresses that the fit between system design and the country's political context is decisive (Lijphart, 1999; Cheibub, 2007).

Policy Analysis

Nepal's own political journey has been turbulent. The country transitioned from an absolute monarchy through a party-based system (post-1990) and a Maoist insurgency to a federal republic in 2008. The 2015 constitution enshrined federalism, secularism, and inclusiveness. In principle, a parliamentary system was seen as best suited for accommodating Nepal's vast ethnic, linguistic, and regional diversity by requiring multi-party cooperation.

In practice, however, Nepal's parliamentary experiment has been unstable. Since 2015, prime ministers have been unable to rely on cohesive legislative support; governments have fallen due to internal party splits and defections (Thapa, 2025). As a result, policies on development, infrastructure, and social programs suffer discontinuity whenever coalitions realign. Bureaucratic administrators, facing an uncertain tenure of their political masters, often lack direction. Thapa (2025) reports that party factionalism, weak coalitions, and constitutional ambiguities have been major internal drivers of instability in Nepal's recent history. External pressures and corruption have compounded these problems, but the core issue has been a fragmented party system.

Against this backdrop, some have argued that a presidential model could inject stability. A directly elected Nepali president could theoretically provide unified leadership and a clear policy agenda, capable of bridging party lines through a national mandate (Cheibub, 2007). For a geographically and culturally diverse country like Nepal, a strong president might symbolise unity and make decisive national decisions (Kapur, 2016). However, Nepali critics caution that weak institutions and endemic corruption could turn a powerful presidency toward authoritarianism. The lack of a strong institutional framework and vigilant opposition could allow abuses.

By contrast, a semi-presidential model might temper these extremes. If the Nepali president were largely ceremonial or focused on strategic leadership, while a prime minister from the legislature handled daily governance, the dual system could preserve checks and balances. This might mitigate the "winner-takes-all" problem of presidentialism by requiring compromise between the president and parliament. On the other hand, Nepal's history of strong premierships suggests that elevating a president's role could provoke power struggles. The experience of other semi-presidential states – for example, Sri Lanka's repetitive tussles between president and prime minister – warns that unclear divisions can paralyse governance.

Overall, Nepal's social heterogeneity and recent institutional experiments mean that any system change must consider more than abstract design. Federalism links the centre and provinces; social inclusion requires broad representation; a reputation for consensus is fragile. Shifting to presidentialism could centralise decision-making in Kathmandu, risking alienation of provinces. On the other hand, a properly structured semi-presidential model could potentially accommodate diverse coalitions while ensuring executive continuity. The crucial point is that empirical success depends on aligning the chosen system with Nepal's political culture, party structure, and constitutional safeguards (Lijphart, 2012; Constitutional Transitions, 2014).

Policy Analysis

Policy-making outcomes vary under different systems. In Nepal's parliamentarism, frequent government turnover leads to policy discontinuities. Long-term development plans in areas such as infrastructure, education, or health are often abandoned when administrations change. Empirical analyses of Nepal's recent legislatures note that shifts in ruling coalitions bring sharp reversals or delays in the implementation of major projects (Thapa, 2025). This undermines the constitutional goals of stable, inclusive progress that were intended by the 2015 framework.

In a presidential system, policy-making is theoretically more streamlined. A single-party executive with a fixed term can push through an agenda without constant coalition negotiations. Cheibub (2007) argues that this can produce clarity and efficiency in high-stakes areas like national development or foreign policy. Indeed, research shows that presidential executives often implement large-scale economic and infrastructure programs with fewer legislative obstacles (McManus & Ozkan, 2018). For Nepal, a powerful president could provide focused leadership on development goals, potentially improving implementation speed. However, this assumes strong oversight; without robust institutional checks (an effective judiciary, independent audit agencies, etc.), a president might govern by decree and circumvent democratic accountability (Linz, 1990; Shugart & Carey, 1992).

A semi-presidential system offers an intermediate path in policy terms. It retains a significant presidential figure who can set broad priorities, but entrusts day-to-day administration to a prime minister responsible to parliament. Constitutional Transitions (2014) note that semi-presidentialism can act as a "hedge against… parliamentary chaos" by ensuring decisive leadership when needed, while preserving legislative input. In practice, a Nepal with semi-presidentialism might see the president guiding foreign policy or national vision, while the prime minister manages domestic policy with parliamentary confidence. This could combine the presidential model's stability with the parliamentary model's inclusiveness. Careful design – for example, clearly defining which powers the president may exercise independently – would be needed to prevent confusion.

Finally, socio-demographic factors matter. Nepal is a multi-ethnic democracy with commitments to federalism and inclusion. Any system must support representation. A purely presidential regime with a single-person executive might marginalise minority voices unless power-sharing is institutionalised elsewhere. A parliamentary or semi-presidential regime inherently involves party negotiation, which can be more inclusive (Lijphart, 2012). Thus, analysts emphasise that even if stability is the goal, Nepal must preserve mechanisms for broad participation in policymaking. From this perspective, a semi-presidential system could potentially combine stability with power-sharing, whereas a full presidential system would need strong constitutional checks (Lijphart, 2012; Constitutional Transitions, 2014).

Research Gap

Existing literature on Nepal's governance system has largely been descriptive or journalistic. Few academic studies have systematically evaluated alternative executive models in the Nepali context. Thapa (2025) notes that analyses of Nepal's 2022–24 political turmoil often identify causes (e.g. coalition weakness, corruption), but do not explore structural solutions. Similarly, past scholarship has catalogued Nepal's political changes without comparing them to what might have occurred under different constitutions. In short, there is a lack of empirical, comparative research on presidential versus parliamentary systems in Nepal.

Internationally, comparative politics offers insights but often focuses on long-standing democracies or Latin American cases. There is scant research on new or transitional democracies like Nepal contemplating systemic shifts. In Nepal's policy discourse, proposals for presidentialism or semi-presidentialism have been advanced, but usually without referencing cross-country evidence or constitutional design literature (Thapa, 2025; Constitutional Transitions, 2014). This study addresses that gap by bringing together theoretical arguments and data from other countries to inform Nepal's debate.

METHODS

This research is qualitative, descriptive, analytical, and comparative. It relies entirely on secondary sources: constitutions, policy documents, academic publications, and news analyses. The study proceeds in several stages. First, it surveys constitutional texts and scholarly literature to outline how presidential and semi-presidential systems function. Second, it examines international case studies and academic analyses to identify successes and failures of these models. Third, it critically evaluates how those lessons apply to Nepal. This design enables careful cross-national comparison and contextual evaluation of institutional performance (Lijphart, 2012; Cheibub, 2007).

Research Design

The research design is qualitative and comparative. It does not gather new statistical data but instead synthesises existing information to build arguments. The analysis is descriptive (explaining how each system operates in theory) and analytical (assessing implications for Nepal). A comparative approach explicitly contrasts Nepal's parliamentary experience with examples of presidentialism and semi-presidentialism abroad. International case material – such as the U.S. (presidential) and France or Sri Lanka (semi-presidential) – is used as reference. The theoretical framework draws on political science literature on regime types (Linz, 1990; Elgie, 1999; Cheibub, 2007). This approach helps ensure that conclusions are grounded both in concepts and in documented practice.

Sampling

The "sample" in this study is not a set of respondents, but rather a collection of informative cases and sources. It includes constitutional frameworks, expert analyses, and media commentary from Nepal and selected comparative countries. For example, statements by Nepali political leaders on institutional change are considered alongside academic studies of presidentialism elsewhere. This broad sampling of secondary material is intended to capture a range of perspectives on governance issues.

Nature and Sources of Information

All information is qualitative. Sources include: Nepal's 2015 Constitution and amendment history; laws and policy documents on governance; scholarly books and articles on executive systems (e.g. Linz, 1990; Cheibub, 2007; Lijphart, 2012); policy reports from think tanks (e.g. Constitutional Transitions, 2014); and relevant journalistic accounts of Nepali politics (Thapa, 2025; Asia Pacific Institute, 2025). International journal articles on democratic institutions (e.g. McManus & Özkan, 2018) inform general claims about stability.

Data Collection Tools

Data was collected through two main methods: literature review and desk research. (1) Literature review: Academic and constitutional sources were studied to establish a theoretical foundation. This included textbooks (Mahajan, 2016; Kapur, 2016), scholarly books (Cheibub, 2007; Elgie, 1999; Shugart & Carey, 1992), and peer-reviewed articles (McManus & Özkan, 2018; Kujanen,

2024). Key concepts and quotations from these works were extracted. (2) Desk research: Comparative information was gathered by reviewing constitutional texts and governance reports from other countries, as well as analyses by international organisations (e.g. NYU's Constitutional Transitions report). News analyses and policy papers (e.g. Thapa, 2025) provided context on Nepal's recent experience. Cross-country data (such as examples of system changes in Africa or Asia) were also synthesised from open sources.

Analysis and Presentation of Data

The collected information was organised thematically in line with the study's objectives. Key themes (stability of the system, executive power balance, role of parties, policy continuity, etc.) were coded during analysis. For example, passages discussing coalition breakdowns in Nepal were coded under "instability" and "coalition weakness." Comparative features of each system (such as mode of election of the executive, tenure security, and party influence) were also identified across sources.

Thematic analysis was conducted descriptively: facts and arguments were grouped under relevant headings. For instance, all literature on presidential term stability was examined together, and all material on checks and accountability was analysed jointly. The study uses this qualitative synthesis to draw contrasts and highlight implications. Where useful, comparisons drawn in tables in the original data have been translated into narrative form here. The presentation is thus both descriptive (explaining each system) and comparative (assessing suitability in Nepal).

Data Coding and Classification

Document excerpts were classified with codes such as *"system stability"*, *"executive-legislative relations"*, *"party role"*, and *"policy continuity."* This helped focus the analysis on how different systems address these dimensions. For example, information about fixed presidential terms was coded under stability, while observations on party-dominated coalitions were coded under party influence.

Comparative Analysis

A systematic comparison was made between Nepal's current system and alternative models. Case examples from France (semi-presidential) and Sri Lanka (semi-presidential) were used to illustrate theoretical points, as were examples like the United States (presidential). Data on how often governments change, or how policy continuity has fared, was considered alongside constitutional differences. This direct comparison highlights contrasts: for example, the ease of executive dismissal under Nepal's parliamentarism versus the fixed terms of a hypothetical president.

Use of Tables

Although this report is narrative, tabular comparisons were used internally to clarify points. For example, a table comparing *"Power Division," "Stability," "Head of State Election," "Party Role," and "Suitability in Nepal"* across the three systems helped structure the analysis. Similarly, objectives such as examining the strengths of each system were tabulated with key findings. In the rewritten text, these tables have been described in prose form rather than presented visually, to meet the academic style requested.

Delimitation and Quality Standards

Delimitation

This study is delimited to Nepal's post-2015 constitutional context and the broad question of executive structure. It does not analyse electoral systems, local government structures, or in-depth

party ideology. Its focus is on comparing national executive models (parliamentary, presidential, semi-presidential) in terms of governance outcomes.

To ensure quality and credibility, the analysis prioritised authoritative sources: constitutional texts, peer-reviewed journals, and expert publications (Lijphart, 2012; Constitutional Transitions, 2014; Thapa, 2025). The theoretical framework is clearly stated, and methods (literature review and comparative analysis) are explicitly described. Claims are supported by citations to relevant literature. Efforts were made to maintain neutrality and acknowledge the limitations of each source. Transparency is maintained by disclosing all major sources and their contexts, avoiding biases or unsubstantiated claims (Thapa, 2025).

ANALYSIS AND DISCUSSION

Performance Analysis of Nepal's current Parliamentary Governance System

Under Nepal's parliamentary model, governance has been marked by chronic instability. Since the republic was established, governments have lasted only months on average. Thapa (2025) reports that between 2022 and 2024, no coalition held power through the full term due to infighting and defections. This volatility has seriously impeded policymaking: each cabinet change brings a new set of priorities, and many long-term plans have stalled or been scrapped. A stable policy environment has been elusive, slowing development efforts. Moreover, frequent turnover erodes administrative responsibility – civil servants face changing directives, reducing bureaucratic accountability.

Party politics have dominated Nepal's governance at the expense of policy substance. Coalition partners often negotiate cabinet posts rather than policy compromises. As Thapa (2025) notes, "a divided party system and weak coalition governments are repeatedly listed as major factors responsible for instability". This suggests office-sharing has become a goal in itself. Public trust in institutions has declined amid such dysfunction; scandals and parliamentary brawls have further alienated citizens. In effect, the line between the legislature and the executive has blurred. Instead of Parliament acting as a check on executive power, parties in the coalition often control both branches. This has created confusion over jurisdiction and weakened oversight. In sum, Nepal's parliamentary system has struggled to provide strong, consistent leadership or clear accountability (Lijphart, 2012).

Comparative Analysis

Contrasting Nepal's experience with other systems highlights key trade-offs. A pure presidential system would offer executive stability: a president with a fixed term would generally be able to complete that term unless impeached. This continuity can allow the government to pursue long-range policies without the threat of legislative collapse (Cheibub, 2007). McManus and Ozkan (2018) find that presidential regimes, on average, enjoy faster policy implementation but also bear risks of unchecked authority. Indeed, the danger is that without clear boundaries, a president may concentrate power. Linz (1990) warned that in presidential democracies, the absence of a hierarchical link between branches can lead to authoritarian tendencies if the president circumvents the legislature. In Nepal, adopting a presidential system could thus threaten democratic checks and balances. Even if policies proceed smoothly, questions about the imbalance of power and reduced legislative oversight would arise.

In contrast, a semi-presidential system is often seen as a compromise solution. It has the potential to combine leadership stability with accountability. The president provides national leadership, but the prime minister (dependent on Parliament) handles governance. This can maintain legislative

authority and mitigate the risks of excessive executive power. According to Constitutional Transitions (2014), "semi-presidentialism can serve as a hedge against parliamentary chaos" by ensuring that some executive leader can act decisively. Crucially, because the prime minister must retain parliamentary confidence, power-sharing keeps accountability alive. This theoretically reduces the likelihood of autocratic drift seen in presidential regimes. In Nepal's case, a semi-presidential system might preserve something of the parliamentary tradition (multi-party negotiation and legislative input) while providing a fixed figurehead in the presidency to unify the executive. Empirically, countries like France have used semi-presidentialism to stabilise governance over decades, though with learning through cohabitation challenges (Elgie, 1999). Given Nepal's current plight—marked by executive instability and blurred accountability—a semi-presidential model appears to offer a balanced alternative. It can maintain clear leadership roles (reducing policy confusion) and limit the concentration of power (Constitutional Transitions, 2014).

Practical Possibility of Systemic Transformation in the Context of Nepal

In theory, Nepal's constitution can be amended to change the system of government. A fundamental alteration (to presidentialism or semi-presidentialism) would require a two-thirds majority in Parliament on two occasions, per the constitutional amendment provisions. In practice, however, such a change depends on broad political will and public debate. As of this writing, no major party has initiated a serious legislative effort to adopt presidentialism or semi-presidentialism. Indeed, many political leaders fear losing power under a new system. There has been limited structured discussion at the civic level about the trade-offs of such a transition. Observers note that most Nepali citizens are either unaware of or indifferent to the technical differences between governance systems. Without active public discourse, any shift would lack legitimacy and clarity.

Institutional preparations are also lacking. A move to presidentialism would necessitate redesigning electoral laws (e.g. direct election of the president), judicial oversight frameworks, and balancing bodies (ombudspersons, etc.). Similarly, establishing a semi-presidential model would require defining the exact powers of the president versus the prime minister and the process for resolving conflicts. Nepal has not taken these steps. Reports suggest that structural reforms (like adjusting the electoral system or strengthening party rules) have not kept pace with calls for system change.

Without clear planning, a systemic overhaul could be counterproductive. Constitutional Transitions (2014) emphasises that shifting systems without corresponding institutional reforms risks "centralising political power in a single executive" or creating an institutional vacuum. In Nepal's case, such an experiment might replicate past crises in new forms. For example, if a presidential system were adopted but checks remain weak, the country could see a president dismissing parliament at will or governing by decree. Likewise, an ill-defined semi-presidential system might simply replace one type of conflict with another if parties continue to fracture.

Nevertheless, some analysts argue that over the long run, a carefully instituted semi-presidential system might aid Nepal's democratic consolidation. By providing a stable presidential figure and a parliament-based prime minister, it could rebuild policy consistency and public trust (Constitutional Transitions, 2014). It might also gradually encourage parties to form larger pre-election coalitions, knowing that the president offers continuity while the prime minister must share power. In this way, semi-presidentialism has the potential to deliver executive stability, more effective implementation of policies, and renewed confidence in governance—provided that constitutional design is clear and safeguards are in place.

CONCLUSION

This analysis finds that while Nepal's current parliamentary system has manifested chronic instability and inefficiency, changing the system of government is no panacea. A presidential system could offer stronger, unipolar leadership but at the cost of raising authoritarian dangers unless a culture of accountability is deeply embedded (Linz, 1990; Shugart & Carey, 1992). A semi-presidential system promises a middle path by blending presidential authority with parliamentary oversight, but its complexity requires a mature political environment (Constitutional Transitions, 2014). In Nepal's case, the historical strength of parliamentarism and the urgency of reform suggest that any shift would need extensive preparation: constitutional reforms, clear power-sharing rules, and public consensus. Without such foundations, introducing presidential or semi-presidential governance might simply transplant existing problems. Therefore, while an alternative executive structure could improve leadership clarity and policy consistency, the ultimate success of such a change would hinge on deep institutional and cultural reforms. The findings underline the need for evidence-based debate in Nepal on governance, drawing on both global experiences and local realities. As Nepal contemplates its constitutional future, this study provides a systematic assessment of options, highlighting that democratic stability ultimately depends on strong institutions and civic maturity, not merely on a different label for the executive.

CONFLICT OF INTEREST

The authors declared no conflict of interest.

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E-WASTE AWARENESS AND DISPOSAL PRACTICES AMONG HIGHER EDUCATION STUDENTS IN KATHMANDU VALLEY, NEPAL

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ABSTRACT

Electronic waste (e-waste) is a rapidly growing global challenge, with significant management deficiencies in developing countries like Nepal. While studies have examined general consumer behavior, a critical gap exists in the quantitative assessment of the youth demographic most engaged with technology. This study addresses this by providing the first comprehensive quantitative analysis of e-waste awareness, disposal practices, and barriers among higher education students in Nepal. A cross-sectional survey of 400 students in Kathmandu Valley revealed a significant attitude-behavior gap: while 65.5% were aware of e-waste and 96.2% agreed proper disposal is important, 42.0% admitted to discarding electronics in regular garbage, and only 12.2% used recycling channels. A novel and counterintuitive finding was that Master's students had significantly lower awareness than Bachelor's students (p=0.022), suggesting a potential generational shift in education. The primary barriers were lack of access to recycling programs (34.0%) and inconvenience (29.0%). Crucially, 82.5% expressed willingness to participate if convenient options were available. These findings provide unprecedented empirical evidence of the disconnect between knowledge and action, highlighting the urgent need for improved infrastructure and targeted educational policies to leverage positive student attitudes for sustainable e-waste management in Nepal.

Keywords: *electronic waste, disposal behavior, environmental awareness, higher education, Nepal, recycling barriers, attitude-behavior gap*

INTRODUCTION

Electronic waste (e-waste) – discarded electrical and electronic equipment – is among the fastest-growing waste streams worldwide. Global e-waste generation reached an unprecedented 53.6 million metric tons in 2019 (equivalent to 7.3 kg per capita) (Forti et al., 2020) and was estimated at 62 million tons by 2022 (Balde et al., 2024). Less than a quarter of this e-waste is formally collected or recycled (Forti et al., 2020). E-waste contains myriad hazardous substances (e.g., lead, mercury, cadmium, flame retardants) that can leach into soil, water, and air if improperly handled

(Robinson, 2009). Improper recycling (e.g., open burning, acid baths, informal disassembly) can release toxic pollutants, posing serious environmental and human-health risks (Kharel et al., 2022).

Vulnerable populations – especially women and children – in low- and middle-income countries face the greatest health threats from e-waste due to weak regulations and recycling infrastructure (WHO, 2021).

Nepal is confronting a rapidly expanding e-waste challenge. The Global E-waste Monitor (2024) reports Nepal generates about 41.5 million kg per year (≈41.5 kt), or ~1.4 kg per capita, one of the lowest per-capita rates in South Asia (Balde et al., 2024). However, formal e-waste management is minimal: the Government of Nepal has yet to enact comprehensive e-waste legislation, and most waste is handled informally (Adhikari et al., 2022). A recent review noted that Nepal's e-waste (28 kt/year) is largely processed by unregulated collectors, leading to environmental contamination and health threats (Parajuly et al., 2018). Surveys in Nepal (e.g., Rauniyar, 2024) find that while many consumers are aware of e-waste issues, they often lack knowledge of formal recycling options and instead sell or repair obsolete devices (Rauniyar, 2024).

Higher-education students are a critical demographic for sustainable e-waste management: they are intensive technology users, and as future leaders, their attitudes may shape policy and behavior. Previous studies in Asia and elsewhere have documented mixed awareness among youth (e.g., Shajil et al., 2022; Adeel et al., 2023). However, a significant research gap persists in the Nepalese context. Existing research has primarily focused on the macro-level informal recycling sector or general consumer practices (Parajuly et al., 2018; Adhikari et al., 2022), leaving a lack of empirical, quantitative data on the awareness and practices of the educated youth—a key group for driving future change. To our knowledge, no study has yet provided a quantified, comprehensive assessment of e-waste knowledge and disposal behavior specifically among Nepali university students.

This study aims to fill this gap by surveying higher-education students in Kathmandu Valley. Its novelty lies in establishing the first baseline of awareness and practice for this demographic, investigating the prevalence of the attitude-behavior gap, and identifying the specific, ranked barriers that prevent responsible disposal. The results will provide crucial evidence to inform policymakers and educators in designing effective interventions. (Parajuly et al., 2018).

MATERIALS AND METHODS

A cross-sectional survey was conducted among 400 students at various colleges and universities across the Kathmandu Valley during 2024. Participants were recruited via a convenience sampling approach; surveys were distributed in common areas (libraries, cafeterias) and classrooms to ensure a diversity of academic streams. Eligibility required completion of higher secondary education and current enrollment in a bachelor's or master's program. The questionnaire (see Supplement) was adapted from prior studies (Sadik, 2017; Adeel et al., 2023) and included items on (i) demographic background (age, gender, academic level and field, locality), (ii) e-waste awareness (ever heard of term, understanding of meaning, information sources), (iii) disposal practices (ever discarded electronics in garbage, usual methods – sell, donate, recycle, throw away, etc.), (iv) knowledge of environmental and health impacts, (v) attitudes (importance of correct disposal), (vi) participation in e-waste programs and how they learned of them, and (vii)

barriers to proper disposal and willingness to participate if convenient. Responses were mostly multiple-choice (Yes/No or categorical).

Participation in this study was entirely voluntary, and informed consent was obtained both verbally for in-person surveys and electronically for the online questionnaire. No personal identifiers were collected, and all responses were treated with strict confidentiality. The study posed minimal risk to participants, and the research protocol received approval from the Human Research Ethics Committee (HREC) of Prince of Songkla University.

Data was entered and analyzed using R (version 4.2). Descriptive statistics (frequencies, means) summarized respondent characteristics and responses (Tables 1–3). Cross- tabulations were performed for key variables, with chi-square tests of association.

Logistic regression models were used to examine predictors of binary outcomes (e.g., "Heard of e-waste" vs not). Specifically, we regressed awareness (Yes=1/No=0) on age, gender, academic level (Master's vs Bachelor's), and academic stream. Odds ratios (OR) with 95% confidence intervals (CI) were computed. All p-values were two-tailed with significance set at 0.05.

RESULTS AND DISCUSSION

Demographics

The 400 respondents averaged 22.4 years (SD=3.9); ages ranged 18-32 (Figure 1). Female students slightly outnumbered males (54.25% vs 45.75%; Figure 2, Table 1). Most (90.5%) were pursuing Bachelor's degrees, with 9.5% Master's students. The fields of study included Management (36.5%), Science & Technology (20.8%), Engineering (14.8%), Humanities/Social Sciences (15.8%), Health Sciences (7.8%), and Education (4.5%) (Figure 3, Table 1). Students came from diverse Kathmandu Valley localities (not tabulated).

Table 1. Demographic characteristics of survey respondents (N=400)

Characteristic	Data
Age (mean ± SD)	22.4 ± 3.9
Age range	18-32
Gender	
Male	183 (45.75%)
Female	217 (54.25%)
Academic Level	
Bachelor's	362 (90.5%)
Master's	38 (9.5%)
Academic Stream	
Management	146 (36.5%)
Science & Technology	83 (20.8%)
Engineering	59 (14.8%)
Humanities & Social Sciences	63 (15.8%)
Health Sciences	31 (7.8%)
Education	18 (4.5%)

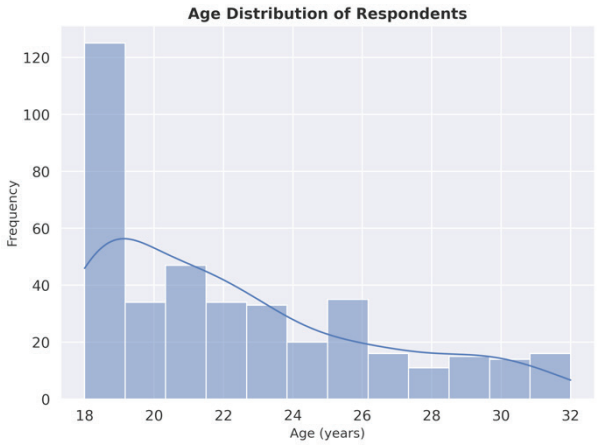

Figure 1
Age Distribution of the 400 survey respondents

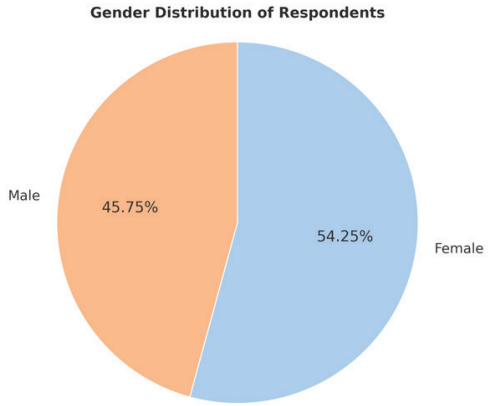

Figure 2
Gender distribution of respondents

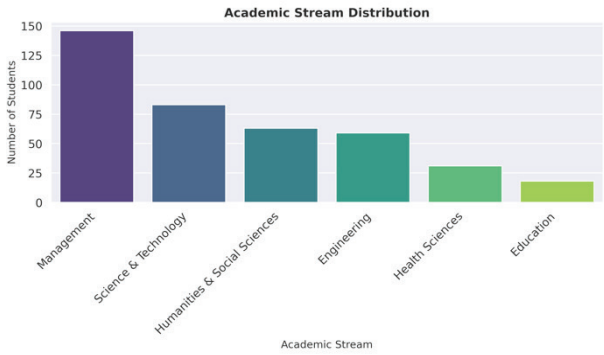

Figure 3

Academic stream distribution

E-Waste Awareness and Knowledge

Most students had encountered the term "e-waste." 65.5% reported having heard of e- waste, while 34.5% had not (Figure 4, Table 2). Similarly, 63.8% said they know what e- waste means (i.e., understand its definition), compared to 36.2% who did not (Table 2). Thus, roughly two-thirds of respondents had basic awareness. Of those who had heard the term, common sources were school/university (32%), followed by social media (25%), friends/family (20%), online search (15%), and other media (8%) (not shown). A large majority (86.2%) reported they had ever been informed about e-waste's harmful environmental effects (Yes vs No, Table 2). Likewise, 83.0% were aware of health hazards associated with e-waste (Yes vs No).

Table 2. E-waste awareness and attitudes among respondents (N=400)

Awareness/Attitude	Frequency (%)
Heard of e-waste	
Yes	262 (65.5%)
No	138 (34.5%)
Know what e-waste means	
Yes	255 (63.7%)
No	145 (36.2%)
Informed of environmental harm	
Yes	345 (86.2%)
No	55 (13.8%)
Aware of health hazards	
Yes	332 (83.0%)
No	68 (17.0%)
Agree correct disposal important	
Yes	385 (96.2%)
No	15 (3.8%)

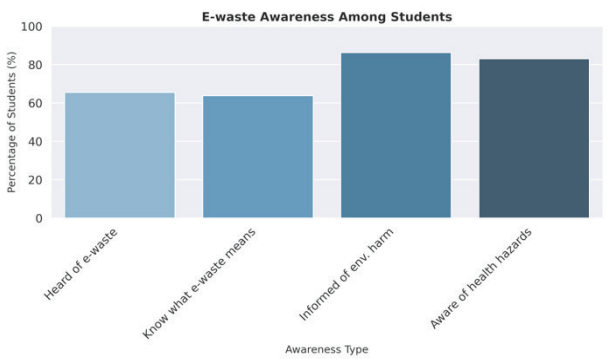

Figure 4

Percentage of students who reported having heard of the term 'e-waste'

When asked about specific impacts, 54.0% selected "all of the above" for environmental impacts (contamination, wildlife harm, greenhouse gases), indicating broad recognition of multiple risks. Similarly, 49.8% chose "all of the above" for health hazards (cancer, birth defects, respiratory problems). In terms of attitudes, 96.2% agreed that it is important to dispose of electronic devices correctly (Table 2), reflecting very positive attitudes toward proper e-waste management.

Disposal Practices and Behaviors

Despite high awareness, a substantial fraction of students had disposed of electronics improperly. Overall, 42.0% reported having ever thrown an electronic device in the garbage, while 58.0% had never done so (Table 3). When asked about their usual disposal methods, the most common response was selling unwanted devices (37.2% of students, e.g., to scrap dealers or secondhand markets) (Table 3, Figure 5, Figure 6). The next most frequent option was donating to others (22.8%). Throwing away was indicated by 20.0% of respondents, and only 12.2% reported recycling their devices. A few students kept devices at home (4.0%) or used informal collection (3.8%). Figures 5 and 6 illustrate these disposal patterns.

Table 3. E-waste disposal practices and participation (N=400)

Practice/Participation	Frequency (%)
Thrown e-device in garbage	
Yes	168 (42.0%)
No	232 (58.0%)
Usual disposal method	
Sell them	149 (37.2%)
Donate them	91 (22.8%)
Throw them away	80 (20.0%)
Recycle them	49 (12.2%)
Keep them at home	0 (0.0%)
Other (informal collector)	15 (3.8%)
Taken part in e-waste program	
Yes	81 (20.2%)
No	319 (79.8%)
Obstacles to proper disposal	
Lack of access to recycling programs	136 (34.0%)
Inconvenience	116 (29.0%)
Lack of knowledge	78 (19.5%)
Cost	46 (11.5%)
Too little e-waste	0 (0.0%)
Willing to participate if convenient	
Yes	330 (82.5%)
No	13 (3.2%)
Not sure	57 (14.2%)

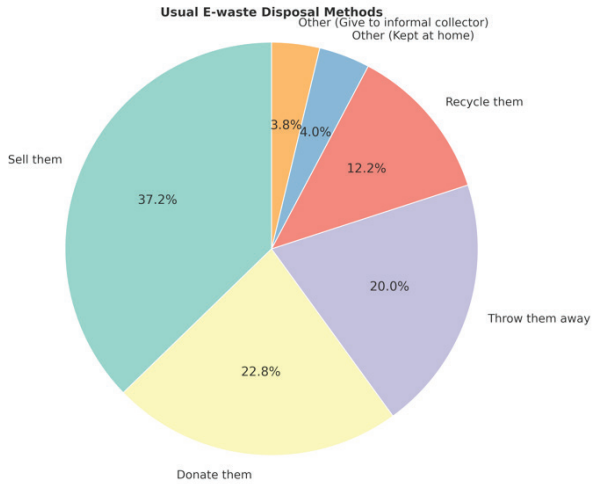

Figure 5

Usual E-waste disposal methods (percentage)

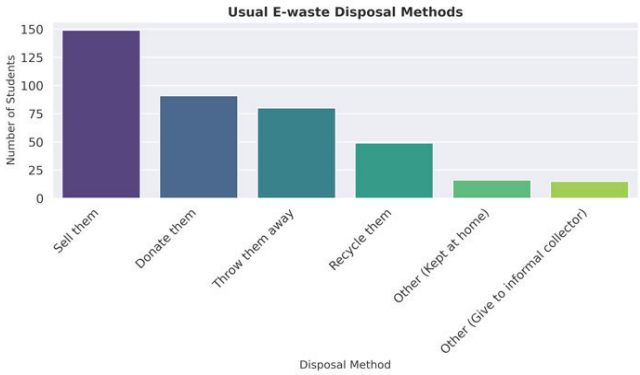

Figure 6

Usual E-waste disposal methods (barchart)

Only 20.2% of students had ever participated in a formal e-waste recycling/disposal program (Yes vs No, Table 3). Among those 81 participants, how they learned of these programs was evenly split: online search (29.6%), social media (22.2%), friends/ family or school (both 19.8%), and local notices (4.9%). Thus, digital channels (social media, internet) and personal networks were key sources of information.

Barriers to proper disposal were also reported (Table 3, Figure 7). The most cited obstacle was lack of access to recycling programs (34.0% of respondents), followed by inconvenience (29.0%), lack of knowledge (19.5%), and cost (11.5%). Only 3.0% reported "too little e-waste" as an excuse. In short, students noted practical and informational hurdles to recycling, consistent with findings elsewhere (Adeel et al., 2023).

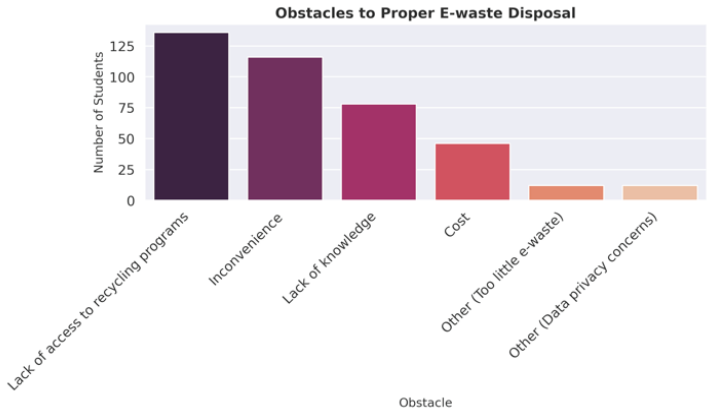

Figure 7

Obstacles to proper E-waste disposal

Notably, willingness to act was high: 82.5% said they would willingly participate in an e-waste recycling program if one were conveniently accessible (yes vs no/not sure) (Figure 8). Only 3.2% outright said "No," and 14.2% were "Not sure." This gap between willingness and current participation suggests that improving accessibility could greatly boost proper e-waste disposal.

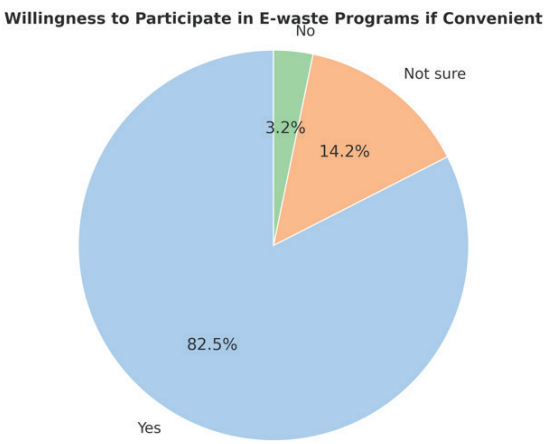

Figure 8

Willingness to participate in E-waste program if convenient

Inferential Analysis

We tested for associations between awareness and demographic factors. By chi-square test, there was no significant gender difference in having heard of e-waste ($\chi^2(1)=0.095$, $p=0.758$), nor by field of study ($\chi^2(5)=2.687$, $p=0.748$). However, there was a significant association with level of study: Master's students were less likely to have heard of e- waste than Bachelor's students ($\chi^2(1)=5.254$, $p=0.022$; Table 4). This result was confirmed in logistic regression.

Table 4 presents the chi-square tests for the outcome awareness of the term "e-waste." Age and gender were not significant predictors. Being a Master's student (versus Bachelor's) was associated with significantly lower odds of awareness (OR=0.46, 95% CI 0.23–0.91, p=0.025). None of the academic disciplines (engineering, management, etc.) showed significant effects (all p>0.05). Thus, the strongest predictor of awareness in our model was level of study, possibly reflecting recent undergraduate curricula that emphasize environmental topics.

Table 4. Chi-square tests of association for e-waste awareness

Analysis	Statistic	p-value
Chi-square Tests		
Awareness by Gender	$\chi^2(1) = 0.095$	0.758
Awareness by Academic Level (Bachelor's vs Master's)	$\chi^2(1) = 5.254$	0.022
Awareness by Academic Stream	$\chi^2(5) = 2.687$	0.748

For the outcome having ever thrown a device in the garbage, logistic regression indicated a non-significant trend: engineering and health-science students showed higher odds (OR≈2.9 and 2.8, respectively) of disposal in garbage, but these did not reach statistical significance (p≈0.07–0.11). In general, no strong demographic predictors of improper disposal emerged in our models, suggesting that this behavior is widespread across groups.

Figure 9 shows the percentage of students aware of e-waste by academic stream, while Figure 10 displays the percentage who have thrown e-devices in garbage by academic stream. Figure 11 presents the odds ratios from the logistic regression model predicting awareness, showing that Master's level is the only significant predictor (with lower odds of awareness).

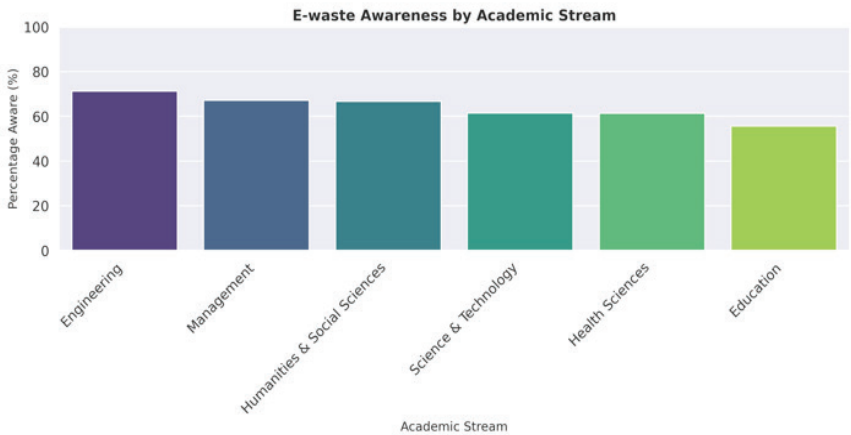

Figure 9

Bar chart showing awareness of e-waste across different academic streams

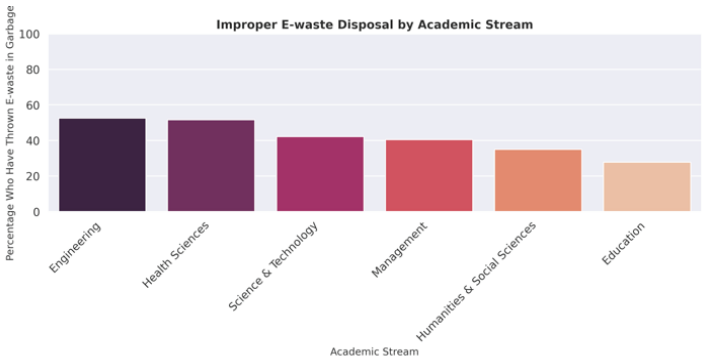

Figure 10

Improper e-waste disposal by academic streams

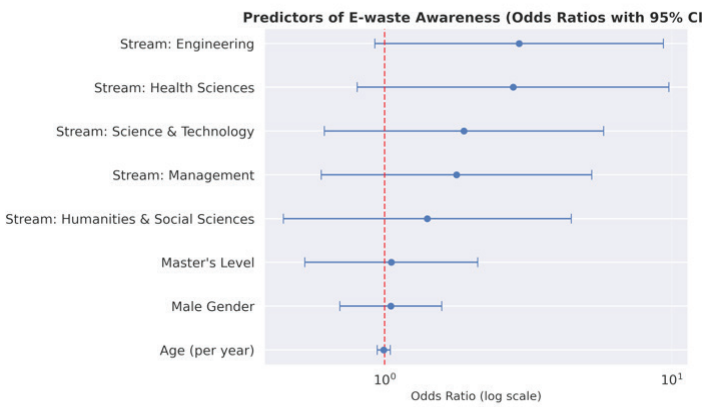

Figure 11

Predictors of E-waste awareness (odds ratios with 95% CI)

DISCUSSION

The awareness levels are comparable to or slightly higher than those reported in other studies of educated youth in Asia. For instance, our finding of 65.5% awareness is somewhat lower than the 76% of consumers with good e-waste knowledge reported by Shajil et al. (2022) in Tamil Nadu, a difference that may reflect varying national educational policies or media coverage levels. Similar to the qualitative findings of Adeel et al. (2023) in Pakistan, which noted low overall awareness except among engineering majors, our study found that academic stream was not a significant predictor, though engineering and health-science students showed a non-significant trend towards higher improper disposal rates.

The most intriguing finding was that Master's students demonstrated significantly lower awareness than Bachelor's students. This counterintuitive result contradicts the assumption that

higher academic attainment correlates with greater environmental knowledge. We theorize that this may reflect a curricular modernization effect; recent undergraduate programs in Nepal may have integrated contemporary topics like e-waste and sustainability more effectively into their core curricula, whereas Master's programs, often more specialized, might not reiterate these foundational environmental concepts. Alternatively, it could be a cohort effect where younger students are more exposed to environmental messaging through social media and recent public campaigns.

Despite reasonable awareness, actual disposal practices were suboptimal. Over 40% of students admitted to having thrown devices into household garbage, and only 12% reported recycling. Instead, most students either sold used devices or donated them to others. Selling to scrap dealers was the most common (37%), a pattern noted in similar Nepalese contexts (Rauniyar, 2024) and in Tamil Nadu (Shajil et al., 2022). That finding suggests a persistent reliance on informal markets. Only one-fifth had ever participated in any organized e-waste program. Nevertheless, most students expressed willingness to do so if convenient, indicating a readiness to improve their behavior if systemic barriers are removed.

The principal barriers identified – lack of convenient recycling facilities and general inconvenience – echo those found elsewhere. Prior qualitative work in Pakistan similarly noted "non-availability of disposal facilities" and "nostalgic attachment" as hurdles (Adeel et al., 2023); in Nepal, Parajuly et al. (2018) also emphasized the absence of formal channels and regulatory support. Addressing these obstacles (for example, establishing campus collection points, introducing take-back schemes) could leverage the positive attitudes uncovered here.

Our findings align with broader evidence on e-waste in South Asia. The World Health Organization notes that countries like Nepal, without established e-waste regulations, face growing hazards from electronic junk (WHO, 2021). The fact that nearly all students agreed on the importance of proper disposal suggests fertile ground for educational interventions. It also contrasts with the relatively low formal recycling rates nationally (less than one-fourth of e-waste is recycled globally (Forti et al., 2020), and Nepal has virtually no official recycling program). Thus, university curricula and public-awareness campaigns should emphasize e-waste risks and recycling pathways, in line with recommendations from global reviews (Balde et al., 2024).

Limitations

This study surveyed students from Kathmandu Valley and used convenience sampling, which may limit generalizability to all Nepalese youth. Self-reported behaviors can be affected by social desirability. Nonetheless, the large sample (n=400) and the consistency of findings with prior qualitative studies in the region (Parajuly et al., 2018; Rauniyar, 2024) lend credibility. Future research could extend to rural areas and track changes after awareness programs.

CONCLUSION

This study provides the first quantitative assessment of e-waste awareness and disposal practices among higher education students in Kathmandu Valley, Nepal. Our findings reveal that while awareness levels are moderate (65.5% had heard of e-waste) and attitudes are positive (96.2%

agree proper disposal is important); actual disposal practices remain suboptimal, with 42.0% having discarded electronics in regular garbage and only 12.2% using recycling channels. The most common disposal method was selling to secondhand dealers (37.2%), indicating a strong reliance on informal markets.

The key barriers to proper e-waste management identified were lack of access to recycling programs (34.0%), inconvenience (29.0%), and lack of knowledge (19.5%). Importantly, 82.5% of students expressed willingness to participate in recycling programs if conveniently available, suggesting significant potential for improvement if structural barriers are addressed.

These results underscore the need for policy and practice improvements. Higher- education institutions in Kathmandu could implement campus e-waste collection drives and integrate e-waste topics into courses. Policymakers should expedite draft legislation (e.g., extended producer responsibility) and support community-based recycling initiatives, as recommended in the literature (Parajuly et al., 2018). Engaging socially- conscious students can create a multiplier effect for sustainable e-waste management in Nepal.

CONFLICT OF INTEREST

The authors declared no conflict of interest.

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None

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