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Message from Chief Patron

The BUP Journal serves as a wider platform for the dissemination of cutting-edge research findings generated by a distinguished group of scholars, professionals, and industry luminaries of Bangladesh. I am happy and honoured to convey to you that the BUP Journal (Volume 11, Issue 1), a compendium of scholarly inquiries, encompassing a diverse spectrum of disciplines and ensuring meticulous peer-review process and adherence to the international standards of scholarly publication.

I commend the editorial board of the BUP Journal and the Centre for Higher Studies and Research (CHSR) for their unwavering dedication and painstaking efforts in ensuring the successful publication of this issue. I also extend my gratitude to the reviewers for their critical assessments and constructive feedback, which have elevated the academic quality of the articles. To the contributors, I express my heartfelt appreciation for their invaluable research that enriches our collective understanding and paves the way for further exploration.

This volume constitutes a valuable repository of knowledge for researchers, educators, and practitioners. I believe that this issue offers a wealth of insights that have the potential to stimulate intellectual discourses, catalyze innovation, and contribute significantly to the advancement of knowledge across a broad spectrum of academic domains.

Major General Md Mahbub-ul Alam, BSP, ndc, afwc, psc, MPhil, PhD
Chief Patron, BUP Journal &
Vice Chancellor, Bangladesh University of Professionals

Message from Chief Editor

Mankind has continually sought to uncover truth by pursuing knowledge that shapes and defines the essence of existence. BUP Journal is a testament to our commitment to uncovering truth and fostering academic excellence. Each article featured here reflects the hard work, intellectual rigor, and innovative thinking of scholars dedicated to addressing critical issues in their respective fields.

Our contributors this time have explored topics from green human resources, education, development studies, online learning systems, and literature. These articles not only provide in-depth insights but also open avenues for further research and collaboration. We take pride in the diversity of perspectives and the interdisciplinary approach that defines this issue, enriching the discourse within the academic community.

I would like to express my profound gratitude to the Chief Patron of the Journal and the esteemed Vice Chancellor, Major General Md Mahbub-ul Alam, BSP, ndc, afwc, psc, MPhil, PhD for his invaluable support, keen interest, and guidance throughout the process of publishing BUP Journal, Volume 11, Issue 1.

I also extend my heartfelt appreciation to the authors, reviewers, and editorial team, whose relentless efforts and scholarly dedication have made this publication possible. I also thank our readers for their continued support and enthusiasm, which inspires us to reach greater heights.

I hope you find the content stimulating and thought-provoking as you explore this issue. Together, let us continue to push the boundaries of knowledge and contribute to a brighter, more informed future.

Brigadier General Mohammad Shahiduzzaman Khan, ndc, afwc, psc
Chief Editor, BUP Journal &
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Contents

Human Resource Audit as a Tool for Ensuring Green Human Resource Management in the Leather Goods and Footwear Industry in Bangladesh

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Abstract

The present era necessitates sustainable organizational practices to ensure a pollution-free, conducive working environment, making it an inevitable issue. Green Human Resource Management (GHRM) is a way to perform HR activities sustainably. HR audits can play a critical role in implementing the GHRM practices in the organization by reviewing the quality of all green HR activities. The study demonstrates the importance of HR audits and its association with Green HRM in Bangladesh's leather goods and footwear industry. To conduct this study, primary data were used by conducting a questionnaire survey of 200 employees working under the different leather companies' HR departments and analyzing the data through the Structural Equation Model (SEM) by SmartPLS 4.00 version. Results suggest that there is a significant impact of HR audits on Green HRM practices within the organization. The study provides valuable insights for academia, HR practitioners, and policymakers on adopting green practices in a scrutinized way.

Keywords: *Green HRM, HR Audit, RBV Theory, Leather Goods Industry, Environmental Sustainability*.

1. Introduction

Environmental sustainability is a must-do approach in the recent age as the pollution in the atmosphere soaring all over the world and there is constant pressure for companies from the stakeholders to transform their activities into environment-friendly approaches (Coelho et al., 2024). A progressive development in ensuring environmental sustainability is expected by the key stakeholders from government offices to general customers (Rubel et al., 2023). Thus, an eco-friendly economy through business activities might assist in solving

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the current environmental challenges and can create sustainable economic growth. Sarfraz et al. (2023) opined that organizations should initiate social and environmental growth through sustainable operations and social accountability apart from only competitive advancement. In the present time, "Green industry" concept is required to be known and adopted by every industry. The term "green industry" derives from the notion of "green economy," a sustainable pathway endorsed by organizations such as the World Bank and the United Nations Environment Program (UNEP) (Barbier, 2012).

A green industry prioritizes industrial production without compromising the natural environment and human health (Hall and Dickson, 2011). This type of industry seeks to integrate environmental and social factors with financial considerations (Reza et al., 2017).

The leather sector in Bangladesh has substantial environmental obstacles associated with the discharge of hazardous waste, heightening the need for industry leaders to tackle pollution problems by implementing efficient waste management practices (Islam et al., 2024; Paul et al., 2013)

Leather goods and footwear companies' environmental concerns should catch close attention as this industry pollutes the environment in numerous ways. Apart from various initiatives to mitigate this pollution, concentration on Human Resources should be given. To attain and ensure environmental sustainability and create green industry, organizations should practice proper utilization of HR policies (Pham et al., 2020; Paillé et al., 2014). HR activities need to be entitled to the execution of ecological balance and environment-friendly practices (Kapil, 2015). As a part of environmental concern and contribution towards the development of natural resources, Green Human Resource Management (GHRM) can be employed. GHRM promotes the appropriate use of resources within the organization and encourages adopting environmentally sustainable practices (Sabokro et al., 2021). This green practice has been identified as a source to raise the sense of motivation and devotion among employees, increase organizational performance, create sustainability (Marrucci et al., 2021), and ensure competitive advantage (Dluhopolskyi et al., 2023; Sroufe et al., 2010). To ensure the sustainable use of HR, continuous monitoring is required. Human Resource (HR) audits can perform this monitoring role. HR audit is a systematic assessment of designing jobs, selection process, evaluating training and development programs, performance appraisal, administering compensation, participatory management, safety, and health issues (Zarandi et al., 2024; Prasad and Babu, 2017). Other than financial auditing, HR Audit is an investigative instrument to appraise human resources compliance. HR Audit is crucial for the

organization to avoid regulatory obligations that may be exerted from the organizational HR policies (Vasantham, 2021). HR Audit on GHRM practices is an inclusive valuation of the company's present HR activities conforming to the compliance and regulations and identifying the critical areas for improvement. It enables the company to establish the best practices and discover opportunities for improvement (Zarandi et al., 2024). Yadav and Dabhade (2014) argue that effective audit includes the standard measures and application of policies about the environment which is the striking factor for businesses to run ecological operations and generate green strategies (Mehta and Chugan, 2015). This study attempts to find out the impacts of HR Audit on Green HRM practices in the leather goods and footwear industry of Bangladesh.

2. Problem Statement

Environmental pollution leads to substantial environmental disasters and detrimental results are taking charge of the depletion of the ozone layer, ocean adulteration, global warming, etc. (Sun et al., 2022; An et al., 2021). According to the Environmental Performance Index (EPI), South Asia, India, Bangladesh, and Pakistan are rated poor in terms of managing environmental systems (EPI, 2020). The report also indicated that those countries' air is dreadful. These are 10 of the nations that are worst affected by air pollution (IQAIR, 2019). Unplanned industrialization, expansion of business around the world, continued economic growth, etc. are the main reasons for the arising of the depletion of natural resources. Since climate alteration can hinder economic progression, global economies will not continue if resource consumption continues at this current pace (Li and Wu, 2023). Bangladesh is one of South Asia's most densely inhabited and growing nations, having undergone significant economic expansion over the past two decades (Zahan et al., 2024). While the Readymade Garment (RMG) sector is the predominant exporter in Bangladesh, the leather industry significantly contributes to exports, employment, economic growth, and the overall welfare of the Bangladeshi population (Arbeid, 2017). The detrimental ecological effects of the leather industry have increased attention and concern from environmental organizations and the public, resulting in decreased demand for leather items from Bangladesh (Tanvir et al., 2022). To sustain industrial operations, it is essential to rapidly implement environmentally sustainable practices and technologies in leather manufacturing (Islam et al. 2024). Green HRM can lead this industry to be environmentally sustainable but needs to be monitored closely to make everyone accountable, which is one of the main concerns of HR audits. HR audit previously was not practiced considerably to augment the HR department (Maijoor and Vanstraelen, 2012), but in the present time, companies consider that HR audit is a better means to evaluate the

performance of Human Resource function, and required to improve the system (Muhammad and Naj, 2023; Zakirova et al., 2019). The results of the audit are required to recognize the strengths and weaknesses of HR and progress the present situation (Ishrat and Habib, 2012). It intends to ensure effective Human Resources through the enhancement of competitive advantages (Sharma, 2013). Bakhshizadeh and Sasanian (2014) argued that HR audits help to attain organizational objectives. The absence of an HR audit can have a harmful effect on making the necessary reforms, developing the activities of the organization, and inspecting to ensure health and safety in the organization (Ukil, 2015). Hence, the implementation of the GHRM approach in the leather goods and footwear industry is required to be evaluated to ensure environmental sustainability in a scrutinized way. However, the auditing of human resources and its correlation with organizational advancement and success, as well as the internal cohesion of functional strategies within human resources and their vertical alignment with macro-level organizational strategies, are critical matters to study (Zarandi et al., 2024).

3. Rationale of the Study

Bangladesh has recently positioned itself as a developing country within the Asian area (Ahmed et al., 2023), with commercial sectors serving as the primary drivers of this progress (Rahaman et al., 2023). Apart from the RMG industry, Bangladeshi leather is internationally acclaimed for its superior quality (Mollik, 2022). The growth rates up to March 2024 for leather and related products in the medium, small, and micro-manufacturing sectors and the large industry sector are estimated at 5.55% and 3.46% for FY 2023-24 (BBS, 2024). However, this industry in Bangladesh is facing hurdles due to environmental degradation (Islam et al., 2024). The significant environmental difficulties have increased the industry's burden (Nomani et al., 2022). GHRM can be treated as a proactive initiative for organizations to minimize environmental problems (Ren et al., 2018). These green practices can assist an organization by improving the retention rate of employees, sustainable use of resources, heightened public acceptance, and enhancement in attracting better employees, upgrading productivity, and lessening practices that cause environmental deprivation (Pham et al., 2020). As employees are the backbone of the organization, encouraging them to be green can contribute to ensuring better organization and social profitability (Shreevamshi et al. 2022). To make this green HRM effective a continuous monitoring system is required. For which HR audit can play a key role. The audit helps to measure the result of HR activities and can suggest a pathway for necessary change. As the environment is changing rapidly, it's

essential to stay updated and HR audit can aid the organization in this aspect (Daft, 2016). The environmental audit is primarily concentrated on technical matters and legal adherence, typically conducted by external specialists. However, several enterprises have begun to teach, train, and occupy their internal auditors to perform ecological audits of company services, as a part of the standard annual operational audit (Ljubisavljević et al., 2017). The Leather goods industry needs to be more cautious in terms of accepting and implementing HR audits on the aspect of environment management phenomenon. Thus, the study elucidates the considerations involved in deciding on the implementation of HR audits within the organization and reveals the ramifications of establishing successful Green HRM practices.

4. Objective

The objective of this study is to determine the impact of Human Resource Audit on Green Human Resource Management practices in the leather goods and footwear industry of Bangladesh.

5. Literature Review

5.1 HR Audit

Novelty in the work setting is crucial for any organization (Tajeddini et al., 2020), and HR audits facilitate the enhancement of human resource policies, practices, and procedures aimed at achieving organizational effectiveness (Muhammad and Naz, 2023). Competitive advantage can be attained by acquiring and maintaining effective human resources (Muhammad and Shamsi, 2019). An HR audit entails a method utilized to evaluate HR strategies, policies, and systems to enhance the effectiveness of human resource management (Pandita and Mahato, 2016). Numerous studies have also proposed HR audits for the modernization of Human Resource services (Amarakoon et al., 2018). Historically, the majority of organizations have not used HR audit techniques to enhance the effectiveness of their HR departments (Maijoor and Vanstraelen, 2012). Currently, organizations assert that it is more effective to utilize tools for analyzing the enactment of HR functions, systems, and tools for enhancement (Zakirova et al., 2019). HR Audit tool helps to make a detailed assessment of the current human resources for developing a model of the human resource department's strategy (Samman, 2017). Audit personnel management is required to deal with legal issues and to comply with employment laws (Bieliaieva, 2019). HR Audit attempts to identify whether the practices of the HR department are adequate, effective, and legal (Vasantham, 2021). HR and line managers do not impact the success of HR Audits in the organization (Kotamena et al., 2022). It assesses the HR department's adherence to regulatory requirements for

employment, compensation, safety and health, and dispute resolution, while
enhancing oversight and regulation of all internal organizational functions
(Adaikalasamy, 2017). To mitigate legal complications and ensure compliance
with workforce and occupational regulations, it is essential to conduct an audit in
the realm of people management (Bieliaieva, 2019). HR Audit must be upgraded
yearly, semiannually, or at least every two to three years (Sharma & Goyal,
2013).

5.2 Green HRM

Human resource management techniques serve as an organizational mechanism
that enhances environmental sustainability (Jin et al., 2022; Shafaei et al., 2020;
Zhu et al., 2023). GHRM is an emerging research domain, and its influence on
academic and corporate practices is constantly evolving (Yong et al., 2019). With
the increasing momentum of the green movement, scholars tend to concentrate
more on GHRM (Shahzad et al., 2020). Green Human Resource Management
(GHRM) is responsible for the recruitment, development, and promotion of a
workforce that is environmentally aware, values sustainability, and actively
supports green activities and goals (Faeni, 2024). Opatha and Arulrajah (2014)
describe Green HRM as it is the functional part of HRM done by converting
regular humans into green humans to attain environmental objectives and to
ensure sustainability. As an increasing number of organizations recognize the
significance of incorporating sustainability into their company strategy, corporate
executives are promptly prioritizing the issue of sustainability (Faeni, 2024).
Customer education, employees, water conservation, energy efficiency, and
waste minimization constitute the environmental measures, prominently observed
in office settings (Rubel et al., 2023). Green HRM practice facilitates an
organization through the improvement in the retention of employees, enhanced
goodwill, appealing better employees, progress in output, appropriate use of
resources, lessening of practices of environmental deprivation, proper
consumption of utility, an exemption in tax, and amplified business prospects
(Bangwal and Tiwari, 2015). However, GHRM involves developing, following,
and prolonging the system, creating the employees' becoming sensible in their
personal and professional life span (Aggarwal and Sharma, 2015).

5.3 HR Audit and Green HRM

HR is an effervescent strength for organizations since they are the primary factor
that unswervingly facilitates the attainment of organizational objectives (Sunarto,
2020). Audits of the HR selection process in organizations seek to verify the
existence of clearly defined selection procedures and adherence to legal and

regulatory requirements, which is critical for the selection procedure. Audits must confirm that the institution conforms to all relevant requirements to avert probable forthcoming legal complications (Supardi, 2022). Staff training and development audits seek to verify that these processes align with employee requirements and enhance their proficiency and performance in attaining organizational objectives (Supardi, 2022). Adherence to statutory requirements is essential for the effective operation of training and development programs, ensuring they remain compliant with applicable laws. Audits of performance appraisals seek to verify the establishment of a systematic performance appraisal procedure (Supardi, 2022). Conducting a systematic HR audit can beneficially impact employees, as they perceive that their organization is proactively enhancing their working conditions, which will improve the work environment and boost employee morale (Bieliaieva, 2019). Nevertheless, individuals encounter novel work restrictions and must acquire new abilities to endure in a rapidly changing environment due to globalization (Friedman, 1999). It is evident that organizations with a strong environmental orientation embedded in their social framework are more likely to experience increased employee engagement in environmentally sound initiatives (Al-Swidi et al., 2021). Environmental concerns, sustainable human resource practices, ecological understanding, green company culture, and environmentally conscious leadership are essential variables influencing employee eco-friendly behavior in the leather industry in Bangladesh (Rahaman et al., 2023). Every organization has man power for ensuring growth and sustainability and HR audits check their effectiveness in the organization (Bukhari, 2021). Yadav and Dabhade (2014) specified that HR auditing progressed in the latest times and has become an essential decision-oriented tool regarding human resource development. By conducting an HR audit, the size of the HR deficiencies can be abolished or reduced, can easily be extended to the legal compliances, make ensure that there is conformance with the certified standards. Edelman and Suchman (1997) show both legal and organizational actors collaborate in elaborating single, endogenous management that includes (and surpasses) both sectors. Ethics and inclusive attitudes to ethical management, and compliance programs, becoming the backbone of company culture needed to boost employees' morale activity (Roberts, 2009) and HR auditing is an elementary tool for the administration of green practices within an organization.

5.4 Research Gap

HR audit and Green Human Resource Management are both emerging and gaining prominence in managing people within the organization in recent time. However, very few attempts have been undertaken so far to construct a

relationship between the HR audit and the Green HRM, particularly in Bangladesh's leather goods and footwear industry. Alam and Alam (2010) conducted a study on HR audit concentrating on the RMG sector of Bangladesh. Ukil, (2015) revealed that the purpose of an HR audit should be to assess an organization's future needs while taking into account the opinions, sentiments, and facts of all stakeholders in Bangladesh. Research on GHRM research was carried out in a variety of other industries by researchers in Bangladesh, including banking (Hossain et al., 2018; Mozumdar & Hasan, 2019; Rahman, 2020; Rubel et al., 2021, and Sharmin et al., 2022), RMG sectors (Cheng et al., 2023; Islam et al., 2021; Rubel et al., 2021 and Rubel and Rimi, 2024), textile industry (Islam et al., 2021 and Karmaker et al., 2021), tannery sector (Moktadir et al., 2020). However, conducting a more comprehensive investigation and empirical examination is necessary, especially in growing economies and developing countries like Bangladesh. Moktadir et al. (2018) contended that the leather sector in Bangladesh possesses a detrimental environmental and social reputation due to substantial waste generation and material consumption, where it is necessary to follow the environmental code and conduct. Conforming to the compliance and environmental regulations is required to avail of international certification in this industry (Rahman, 2022). Therefore, it is evident that controlling green practices through a scrutinized approach is necessary, and an HR audit could be a solution in this regard. Hence, this study attempts to ascertain to find out the association between HR audit & Green HRM in leather goods and footwear industry in Bangladesh.

6. Hypothesis Development

6.1 HR Audit and Green HRM

Human Resources is a critical resource for firms since they are the key factor that directly enables the achievement of corporate objectives (Sunarto, 2020). Human Resources is not merely a workforce doing operational tasks; it is also fundamental to an organization's capacity to acclimate, invent, and progress in a dynamic setting (Parinsi and Musa, 2023). Organizations possessing excellent, talented, and dedicated workforces have a substantial competitive edge in attaining efficacy, efficiency, and intended benefits (Setiawan, 2016). Firms can thoroughly assess the efficacy of human resources (HR) practices through audits on HR. Systematically performing an HR audit can positively affect employees, as they recognize that their company is actively taking steps to improve their working conditions and such adjustments will enhance the work environment and elevate employee morale (Bieliaieva, 2019). It is evident that environmental experts are pivotal in the pursuit of sustainability (Ferreira et al. 2006). RBV

theory proposes how a company initiates environmental sustainability which can be attained through Green HRM (Malik et al., 2020). Embracing green initiatives can be a critical resource that augments the competitive advantages and sustainability that Resource Based View (RBV) suggests (Jamil et al., 2023). RBV posits that an organization's different capabilities and resources such as intellectual property, valuable assets, knowledge, etc. can attain long-term success. Auditing the adopted green initiatives and practices can be an inimitable resource that can enhance the organizational sustainability and competitiveness that RBV supports. The Resource-Based View (RBV) hypothesis asserts that internal organizational attributes, such as Human Resources (HR), drive organizational development. Yusoff et al. (2020) conducted a study utilizing the Resource-Based View (RBV) framework, wherein they discerned that Green Human Resource Management (GHRM) practices, such as green recruiting, green training, green evaluation, and green benefits, are associated with environmental management. Khan et al. (2017) accompanied a study on the Garment industry of Bangladesh and opined that the least spoken element that are responsible for the variation in HR practices is compliance with auditing policies. An HR audit on GHRM practices is a comprehensive assessment of the company's current HR activities in relation to compliance and regulations, aimed at identifying key environmental areas to develop. To conduct and ensure these green activities HR audit can play a critical role. Thus, it is required to ascertain the relationship between HR audit and Green HRM in the leather Goods and Footwear Industry in Bangladesh. Hence, the hypothesis is -

H1: There is a positive relationship between HR Audit and Green HRM.

7. Theoretical Background and Conceptual Framework

Resource-Based View (RBV) theory is the underpinned theory of this study. RBV deals with internal properties by which the synergy can be formed by efficiently managing the company's resources and helping to gain a competitive advantage (Ghosh and Mukherjee, 2006; Raduan et al., 2009).

HR audit involves diagnosing, analyzing, evaluating, and determining future strategies within the realm of human resource management; multiple approaches for human resource audits exist, each offering distinct assurances and serving various goals (Roy et al., 2020). These audits evaluate both the operational efficiency of HR departments and the influence of HR initiatives on the overall corporate arena (Cohen and Sayag, 2010), particularly in the resource-constrained environments (Dobrescu et al., 2021). The alignment of HR strategy

with sustainability objectives, encompassing the enhancement of human capital, employee well-being, and corporate social responsibility, is comprehended by HR audits (Sukalova and Stofkova, 2022; Kusumaningrum et al., 2022). As the HR audit serves as a mechanism for evaluating the efficacy of human resource strategies (Devara and Sirisetti, 2022), evaluating the Green HR Practices by HR audit can bring much connotation. Adopting green initiatives can serve as an essential resource that enhances the competitive advantages and sustainability proposed by the Resource-Based View (Jamil et al., 2023). The Resource-Based View (RBV) asserts that an organization's diverse capabilities and resources, including intellectual property, valuable assets, and expertise, may achieve sustained success, and the assurance of proper use of these assets can be ensured by HR audit. Thus HR audit may have an impact on Green HRM that Figure 1 depicts.
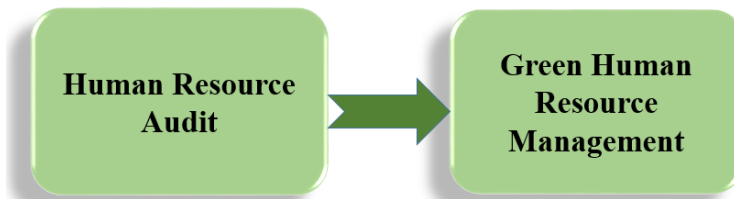
Figure 1: Conceptual Framework

8. Methodology

8.1 Research Type

This is a descriptive type of research. This study was conducted through a questionnaire survey. This type of study aims to identify and delineate the characteristics of the pertinent factors in specific circumstances (Hailu, 2014).

8.2 The Time Reference

This research was directed as a study of cross-sectional. The study proceeds at a single point in time. This method of time referencing is employed to collect data at a single instance, is cost-effective, and encompasses a broad target population; it yields inferential, descriptive, and explanatory information, among other insights (Kothari, 2008).

8.3 Types of Data Collection

Quantitative data was used in this study by conducting a questionnaire survey. This kind of data is always considered structured data.

8.4 Measurement Scale

Direct physically by visiting the respondent's office, and a questionnaire survey was conducted. The questionnaire was prepared with close-ended questions by following a five-point Likert scale from strongly disagree to strongly agree. Pragmatic research validates a high validity and reliability in the Likert-type scale (Westbrook and Oliver 1991). To measure HR audit, five scales are adopted from Muhammad and Shamsi (2019). They developed scales in their study in four distinct dimensions of HR audit and this study concentrates only on the HR functional audit's scale because of the relevance to this study. As this study focuses on the identification of the impacts of HR audit on Green HRM practices, the emphasis is given to the HR functional attributes. Whereas, Green HRM was measured by the 5 items which were developed by Kim et al., (2019).

8.5 Population

A target population is a combination of people who own the information that the researchers are looking forward to collecting, summarizing, and producing results (Birks and Grimley, 2007).

In Bangladesh, the whole leather industry is classified into three categories: processed leather, leather footwear, and leather goods. This study concentrates on the leather goods and footwear industry in Bangladesh. This industry produces footwear as well as different leather items including belts, handbags, clothing, and tiny leather goods like tablet and phone covers, key rings, and portfolios etc. (Arbeid, 2017). Hence, the population of this study is all the employees of under the HR department of different leather goods and footwear industries which are listed under the association of LFMEAB of Bangladesh.

8.6 Sampling Units

This study's sampling unit is the individual employee working under the HR department.

8.7 Sampling Technique

Non-probability judgmental sampling method was used in conducting this study. This is a sampling method in which population elements are deliberately chosen based on the researcher's judgment (Narsh, 2007).

8.8 Sample Size

The sample is a representative part of the population. 200 samples are determined by using the following formula (Cochran, 1977), when the population size is unknown:

$$n = \frac{Z^2 pq}{e^2}, \text{ Where,}$$

n = Size of the sample, z = the value of standard variate at a given confidence level and to be worked out from table showing area under normal curve, p = Sample proportion, q = 1-p, e = acceptable error, z = 1.96 at 5%, p=0.5, so q = 0.5.

Here the sample size is,

$$n = \frac{Z^2 pq}{e^2}, \; n = \frac{Z^2 pq}{e^2}, \; n = \frac{(1.96)^2 \; *0.5*0.5}{0.069^2}, \; n = 201.68$$

For substantial populations with uncertain variability, the necessary sample sizes for precision levels of 5%, 7%, and 10% must be at least 400, 204, and 100, respectively. This study obtained a sample of about 200 with a precision level of 7%. On the other hand, Roscoe (1975) recommended that for behavioral studies sample size less than 500 but more than 30 is suitable; while more than 500 may create Type II error (Sekaran and Bougie, 2016). So, here the sample size is 200 employees.

Before begin to collect data, a comprehensive ethical framework was meticulously integrated into the process. Informed consent, a fundamental principle of ethical research, was carefully acquired from each participant which shows the robustness of the study.

8.9 Data Analysis

Data analysis was conducted using Microsoft Excel and Partial Least Squares Structural Equation Modeling (PLS-SEM). PLS-SEM, employed as the theoretical model in this context, is robust and intricate, provides a higher-order construct, possesses elevated statistical power, integrates advanced methodologies, and executes complex bootstrapping procedures (Hair et al., 2022).

9. Analysis

9.1 Descriptive Statistics

The result of the descriptive analysis shows that among the 200 respondents, 105 were male and 95 numbers of respondents were female. Most of them, 82% have completed bachelor's degree and master's degree. The majority of the respondents are 35 years and less than that. The maximum number of respondents have more than 2 years of experience.

9.2 Reliability and Validity

The validity of the model was assessed using measures of convergent validity and discriminant validity. The convergent validity was analyzed by assessing the average variance extracted (AVE) and composite reliability (CR). The values of AVE and CR must exceed 0.50 and 0.70, respectively (Table 1). The results validate the convergent validity, since all values of Average Variance Extracted (AVE) and Composite Reliability (CR) exceed the needed threshold values.

Table 1: Construct Reliability and Validity

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Green HRM	0.774	0.791	0.846	0.526
HR Audit	0.858	0.87	0.898	0.639

The Fornell and Larcker (1981) criterion was employed to assess the discriminant validity of the model. According to this criterion in Table 2, the diagonal values of constructs should be higher. The results confirm the model's discriminant validity.

Table 2: Fornell Larcker Criterion

	Green HRM	HR Audit
Green HRM	0.725	
HR Audit	0.619	0.799

Discriminant validity was measured for Green HRM and HR Audit. Heterotrait-Monotrait Ratio (HTMT) must be less than .85 according to the recommended guidelines (Hair et al., 2020). Results showed that the discriminant validity is achieved as the HTMT is 0.732.

9.3 Common Method Bias

Common method bias refers to the variance that is not due to the construct of interest, but rather to the measurement method employed. Podsakoff et al. (2003) propose two strategies to mitigate this type of variance: procedural design methodology and statistical quality and process management. In the procedural design phase, the measurement scale was evaluated to assure clarity in wording, minimize ambiguity, and provide uniform instructions for responses. For statistical control, this study occupied the PLS SEM criterion which is further suggested by Kock (2015). The criterion entails that the threshold value of VIF scores should be less than 3.3 which this study also suggests in Table 3.

The findings indicated that the data were robust to common method bias. Robustness pertains to the resilience of the statistical model, tests, and procedures in accordance with the specific statistical criteria (Sarstedt et al., 2020). The notions of HR audit and green HRM demonstrate strong convergent validity, with AVE value more than 0.5 (Table 1) which also shows the robustness of the study.

Table 3: Collinearity Statistics

	VIF
GHRM1	1.601
GHRM2	1.772
GHRM3	2.005
GHRM4	1.505
GHRM5	1.499
HRa1	3.19
HRa2	1.744
HRa3	1.711
HRa4	2.048
HRa5	1.865

9.4 Structural Equation Modeling

The results (Table 4) show that HR Audit positively and significantly impacts Green HRM (β=0.619, t=14.075, p=<0.05) which indicates there is an association between the independent and dependent variables. As the P value is less than 0.05 that indicates that the alternative hypothesis which is, 'There is a positive relationship between HR audit and Green HRM' can be accepted.

Table 4: Total effects- Beta Value, Mean, Standard Deviation, t values, p values

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	t statistics (|O/STDEV|)	p values
HR Audit -> Green HRM	0.619	0.628	0.044	14.075	0
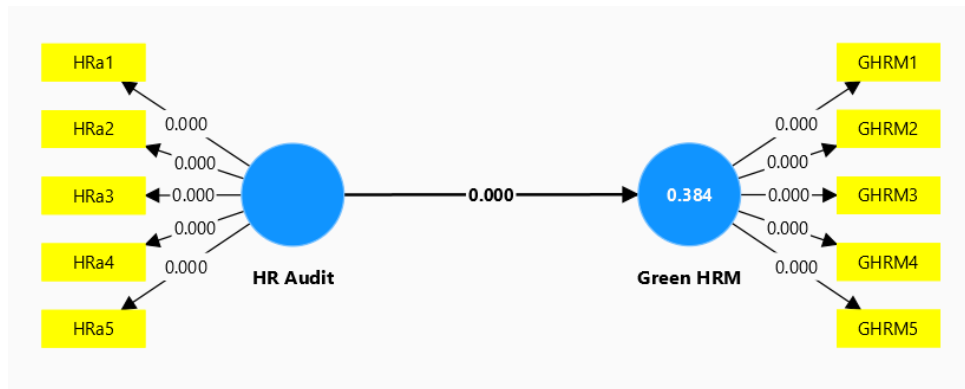
Figure 2: PLS Model

From the PLS Model Figure-2, it is identified that the R square value is 0.384. That indicates that HR Audit accounted for 38.4% variability in the practices of Green HRM, $R^2 = 0.384$ and adjusted $R^2 = 0.381$. In social scientific research, an R-squared of 0.10 to 0.50 is acceptable when some or most of the explanatory factors are statistically significant (Ozili, 2023).

Potential endogeneity difficulties can be identified by utilizing existing findings and theoretical frameworks (Hult et al., 2018). Most prior research included control constructs to mitigate endogeneity concerns (Niazi et al., 2023). No endogeneity concern was identified in the current research study.

10. Findings and Discussion

The result of the study shows that HR Audit positively and significantly impacts on Green HRM practices in the Leather Goods and Footwear industry in Bangladesh. Bieliaieva (2019) suggested that implementing an HR audit will have a positive influence on the employees. Audits of human resources (HR) are indispensable for verifying that HR policies and procedures adhere to relevant laws and regulations. During the audit process, organizations meticulously evaluate their established policies for HR management, encompassing recruiting, selection, training, development, and termination procedures (Supardi, 2022).

Chan (2018) noted that the deficiency of skilled labor constitutes a significant challenge leather industry. On the other hand, Islam et al. (2020) identified 'lack of knowledge and expertise' is the primary hurdle to the implementation of sustainable supply chain management (SSCM) in the leather industry in Bangladesh. The leather sector is deteriorating owing to noncompliance (Akhter et al., 2022). Environmental degradation is left to accumulate, and remediation or mitigation of any adverse consequences may become impractical in Bangladesh (Reza et al., 2017). Undoubtedly, this has emerged as a significant concern for the government, policymakers, and environmentalists about Bangladesh's economic growth (BELA, 2017). Therefore, the adoption and sustenance of environmentally sustainable methods are imperative. Compliance is necessary for obtaining international certification, including the Leather Working Group (LWG) accreditation and this authorization is crucial for market entry in the United States, Europe, and a number of prominent Asian nations (Rahman, 2022). The delay in the complete operationalization of the Central Effluent Treatment Plant (CETP) may further complicate the acquisition of an export registration certificate (ERC) for exporters and an import registration certificate (IRC), which will further delay the international standard certifications (Bangladesh Leather Industry Authority Proposed, 2021). The significance and function of environmental audits, along with the stipulations established in International Standard ISO 14001 are essential to follow (Ljubisavljević and Jovanović, 2017). LEED is the sole recognized entity by the Bangladesh Bank for formal certification of green industry in Bangladesh (Nabi et al., 2016). This certification is required to get recognition as a green firm. Businesses integrate environmental strategies into their operational framework to realize various advantages via effective eco-friendly management: minimizing ecological expenses and waste, augmenting employee enthusiasm and buyer contentment, and cultivating product quality (Gadenne et al., 2009). The current global demand for apparel, footwear, and accessories exceeds $215 billion, however Bangladesh's exports amount to barely $1.08 billion (Akhter et al., 2022). Consequently, this industry possesses significant potential to achieve a competitive advantage through the utilization of optimal efficiency by ensuring environmental concern. GHRM enhances the perception of organizational efforts to establish strategic interactions aimed at fostering a superior environment by motivating, assessing, selecting, administering, training, and advancing a new paradigm among human resources (Sharmin et al., 2022) to promote pro-environmental behavior and dispel misconceptions regarding green environment administration and its relationship with GHRM, which significantly impacts employee performance. HR audits ensure compliance of HR policies and

procedures with relevant laws and regulations, while also assisting organizations in mitigating legal risks associated with labor law violations (Supardi, 2022). The government should attempt to enable growth by using the scraps to create other value-added products. The company owner also has lots of responsibilities in ensuring environmental sustainability. Apart from all the initiatives, Green HRM can play an essential role in the name of sustainability. An HR audit can be conducted by asking and reviewing several questions relevant to the functions of HR. This audit required to trace inadequate personnel files is compulsory to deal with legal issues and to comply with employment laws (Bieliaieva, 2019). Conduction of HR audit on Green HRM, an organization can contribute towards ensuring environmental sustainability, conforming to environmental compliance, and dealing with other issues related to Human Resource function.

11. Managerial Contributions

The academic and managerial contributions of this study are prominent for professionals as well as for organizations. This study has extended the current body of knowledge by examining the correlation between HR audit and Green HRM. This research has been addressed through the Resource-Based View (RBV). This idea posits that an organization can be perceived as an assemblage of human, physical, and organizational assets that are invaluable and irreplaceable, serving as the primary source of sustainable competitive advantage. Because of resource scarcity and escalating environmental challenges, manufacturing industries are increasingly focused on sustainable approaches. Consequently, by adopting green HRM, managers, practitioners, and policymakers can execute green human resource management practices to achieve sustainability. The result of this study suggests that the management in the leather goods and footwear industry should prioritize effective human resource audit strategies and mandate assessments of future demands while evaluating HR effectiveness within the organization. Since, an effective HR audit assesses the organizational capability and employee performance, identifies issues, and addresses them proactively (Bukhari, 2021; Vasantham, 2021), the health-related elements such as workplace cleanliness, access to safe drinking water, waste disposal contribute to enhancement through regular HR compliance audits (Rashid et al., 2022). Decision-makers in Bangladeshi enterprises are currently concentrating on restructuring organizational control systems (Ali et al., 2008; Khan and Khan, 2010), thus HR audit is the must-do approach to ensure environmental compliance. In the leather industry, it is required to have effective collaboration from factory proprietors, awareness among employees, recycling initiatives, engagement of specialized consultants, and most importantly consistent oversight by the audit department (Khan and Akand, 2024). Apart

from the leather goods companies, this study also brings vast connotations towards the authority of different govt. non-govt, regulators, and most importantly the society for which companies are functioning. Results will also assist this industry in implementing green initiatives and achieving sustainability to minimize energy waste, save water resources, and mitigate environmental challenges. Organizations can understand the rationality of using GHRM and to operationalize it properly, they will assent to HR audit.

12. Conclusion

To ensure the Green HRM, HR audit can play a pivotal role by exhibiting the monitoring character. It enables the company to create the best practices and determine the chances for development. The study focuses on the conception of HR audits and the impacts of HR audits on practicing and ensuring Green HRM. Results show that there is an association between HR audit and GHRM in the leather goods and footwear industry in Bangladesh. As leather-oriented firms produce toxic outcomes that are very disadvantageous to the environment (Islam et al., 2024), thus they need to mitigate the adverse effects by adopting several measures. Green HRM may be one of the critical areas. Companies require to provide more focus and importance on employee consciousness regarding Green practices. It is evident that in Bangladesh, maximum number of organizations have the HR department and try to practice the HR functions properly. If close monitoring is being done by the internal auditor as well as by the external one, employees become more conscious of their stand towards green practices. Since, organizations have to give further attention to the environment as a part of social responsibility. The leather goods and footwear companies in Bangladesh must exercise caution and commitment in conducting frequent HR audits to ascertain the efficacy of Green HRM inside their organizations.

13. Limitations and Future Research Direction

While the research offers numerous contributions to both practice and literature, shortcomings are apparent. This study concentrated on the leather goods and footwear industry in Bangladesh. Future studies may also be conducted on other manufacturing industries like RMG, Pharmaceuticals, and Chemical industry, and also on the service sector by considering different environmental factors. Future studies may employ multi-group analysis to compare outcomes across various industries within the manufacturing sector. Secondly, we employ HR audit as a singular variable; forthcoming research could explore the identification and application of the sub-dimensions of HR audit. The moderating role of organizational support and employee characteristics can also be evaluated.

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24   Human Resource Audit as a Tool for Ensuring Green Human Resource
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Appendix- A: Questionnaire

Please give a tick (√) in response to your answer.	
a. Age o Below 25 years o 25 to 34 years o 35 to 44 years o More than 44 years **b. Gender** o Male o Female	**c. Academic Qualification** o Graduate o Master o Higher Degree **d. Working Experience** o Less than 2 years o 2 to 4 Years o More than 4 years

Please give your opinion by providing a tick (√) to the right-sided single alternative. **SD=Strongly Disagree, D=Disagree, N=Neutral, A=Agree and SA=Strongly Agree**							
	Sl.	*Statements*	*SD*	*D*	*N*	*A*	*SA*
Practices of Human Resource Audit	**1.**	In our organization, HR audits improve the effectiveness of learning and development programs for green practices.					
	2.	HR Audit improves the green performance management system in our organization.					
	3.	HR Audit plays a significant role in improving rewards and recognition programs in our organization.					
	4.	HR Audit helps managers to reduce costs in the organization through proper work allocation.					
	5.	Human resource audit positively and significantly					

		contributes to the improvement of employment services.				
Practices of Green Human Resource Management	6.	My organization prefers to recruit and select employees by following environment-friendly approach.				
	7.	My organization delivers sufficient training to promote environmental management aspects.				
	8.	My organization relates employees' eco-friendly behavior to rewards and compensation.				
	9.	Employees fully comprehend the extent of corporate environmental policy.				
	10.	My organization stimulates ethics for environmental issues.				

Exploring Teachers' Perceptions of Technology, Pedagogy, and Content Knowledge in Secondary Education in Bangladesh

Monira Jahan[1]
Moriom Akter[2]

Abstract

The study aimed to explore teachers' perceptions of technology, pedagogy, and content knowledge (TPACK) as teachers in Bangladesh is highly encouraging to follow technology based education. A total of 255 teachers were randomly selected from 20 purposefully chosen schools and madrasas located in 3 different districts of Bangladesh. Following the post-positivist and constructivist paradigms, this study used a parallel mixed-methods research design. Thus, quantitative and qualitative data were generated using a questionnaire and interview. The result indicated that teachers had mixed perceptions of TPACK, ranging from good to medium-level perception. Significant correlations, though trivial, were found among teachers' background variables (i.e., age, teaching experience, gender, educational qualifications, and computer skills) and their perception of TPACK. Moreover, the crucial factors related to the teachers' perceptions towards TPACK were also identified from the qualitative data, which include compensation, administrative support, increased workload, and curriculum. It is expected that the results of this study will lead to a better understanding of the real scenario of teachers' perceptions of TPACK that may have policy implications to take steps and policies of TPACK and technology integration in teaching and learning activities.

Keywords: *Teachers' Perception, TPACK, Technology Integration, Mixed Method.*

1. Introduction

In recent years, education has extended beyond the four walls of the classroom, and there has been a lot of focus on 21st century skills (Valtonen, et al., 2017). Online learning and technology-based education, in particular, are used more

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frequently than before, especially since the start of the COVID-19 pandemic. To keep pace with rapid technological advancements, teachers must be well-versed in a variety of pedagogical methods and the effective use of ICT (Information and Communication Technology). In addition to technological knowledge, teachers should also be equipped with diverse teaching approaches to ensure efficient and effective teaching, thereby preparing their students to become global citizens in the 21st century (Valtonen, et al., 2017; Ansari, 2013).Therefore, the integration of technology, pedagogy, and content knowledge (TPACK)is essential for teachers (Cetin-Berber & Erden , 2015).In many countries, including Bangladesh, this transition poses unique challenges as teachers must learn to effectively utilize devices such as, laptops, computers, smartphones, tablets, and other devices. Without a comprehensive understanding of TPACK, teachers may face difficulties in effectively integrating technology into their teaching and learning activities, limiting their ability to promote critical 21st century skills such as creativity, critical thinking, and problem-solving (Shafie, 2021). Thus, it is crucial for teachers to be digitally proficient and skilled in integrating technology into their pedagogy to deliver high-quality education and adequately prepare students to be competent global citizens (Ansari, 2013).This article, therefore, seeks to explore secondary school teachers' perceptions of TPACK.

2. Theoretical Underpinning of the Study

The TPACK framework, as shown in Figure 1 and Figure 2, proposed by Koehler & Mishra (2006), is an extension of Shulman (1987) notion of Pedagogical Content Knowledge (PCK). In fact, the Technological Pedagogical and Content Knowledge (TPACK) framework provides a theoretical underpinning for teachers, supporting the integration of technology into teaching and learning activities (Koehler & Mishra, 2006).

Figure 1: Two Circle of Pedagogical Knowledge and Content Knowledge

(Source: Shulman, 1987: p.7, 8)
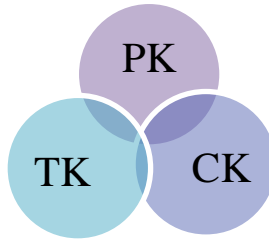
Figure 2: Three Circles of TK, CK, and PK

(Source: Koehler & Mishra, 2006)

Figure 2 depicts the three circles of pedagogical and content knowledge, now joined by pedagogical content knowledge (Koehler & Mishra, 2006). To better understand teachers' knowledge of effective technology integration, Koehler & Mishra (2006) extended PCK by incorporating Technological knowledge (TK) into the framework. As a result, a new framework is introduced containing Technological Pedagogical Knowledge (TPK), Technological Content Knowledge (TCK), and Technological Pedagogical Content Knowledge (TPACK) (Koehler & Mishra, 2006). The authors further added that these three categories of knowledge are essential for teaching and emphasize the importance of leveraging rapidly advancing technological resources. The TPACK framework has been adopted as a theoretical foundation of technological integration in teaching. TPACK consists of seven domains, as illustrated in Figure 3, that blend knowledge of technology, pedagogy, and content, ensuring that technology is used meaningfully in educational contexts.

Figure 3: Complete view of Technological Pedagogical Content Knowledge (TPACK)

(Source: From TPACK.org. website)

The concise explanation of TPACK is illustrated as follows:

- Technological Knowledge (TK) refers to the understanding of various technology tools.
- Content Knowledge (CK) refers to the knowledge of the foundation of the subject taught as well as relevant facts and evidence in a particular field (Koehler & Mishra, 2006).
- Pedagogical Knowledge (PK) refers to the extensive knowledge of educational goals and objectives, principles and standards as well as teaching and learning procedures (Koehler & Mishra, 2006).
- Knowledge of concepts, educational strategies, and prior knowledge of students is referred to as Pedagogical content knowledge (PCK).
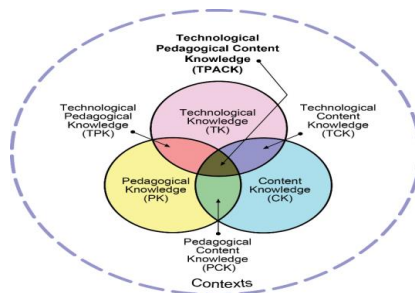- Technological Pedagogical Knowledge (TPK) refers to the understanding of how to use technology to apply teaching methods.
- Technological Content Knowledge (TCK) is the knowledge of the relationships between technology and content knowledge as well as how these relationships affect and constrain each other.
- Lastly, TPACK combines the knowledge and skills of the other essential components. TPACK refers to the knowledge of using the appropriate technological tools to impart a specific topic by utilizing effective pedagogical techniques.

In a nutshell, TPACK offers an integrated framework of teacher knowledge that clarifies the crucial factors affecting the improvement of the teaching and learning process through the use of digital technology.

3. Literature Review

The perception of teachers regarding the relevance of a task for achieving future goals strongly influences pre-service teachers' motivation to use technology (Anderson, Graulx, & Maninger, 2011). Teachers who view technology as less significant and are not particularly motivated to improve their technology, pedagogy, and content knowledge tend to integrate technology less into teaching and learning (Çelik, 2009; Cedillo, 2003). In contrast, teachers who believe that integrating technology into the classroom will benefit students' learning are more enthusiastic to integrate technology in their teaching (Sarhandi, Bajnaid, & Elyas, 2017). Similarly, it is evident that teachers are interested in incorporating technology only when they believe it will benefit students' learning (Mumtaz, 2000).According to Kortrlik & Redmann (2005), significant problems remain with the integration of technology into educational curricula and classrooms, along with many issues derived from the findings of Mumtaz (2000).

Furthermore, literature on TPACK revealed that obstacles, for example, time for lesson planning, scheduling internet research, technology accessibility, administrative support, and teacher anxiety, affect teachers' perceptions of TPACK (Cetin-Berber & Erden , 2015). Successful integration of technology into teaching and learning depends largely on alignment with teachers' perceptions (Ertmer, 2012). A number of studies underscore the importance of teachers' perceptions for effective technology integration and the need for effective teaching strategies (Ertmer, 2012; Cope, 2002; Eshet-Alkakay, 2011; Lee & Tsai, 2010; Sarhandi, Bajnaid, & Elyas, 2017; Cheng 2017) conducted a study on Taiwanese native language teachers' TPACK, which showed that while teachers were generally satisfied with their TPACK, they lacked confidence in CK, TK, and TPK. The teachers' perceptions of CK, PK, and PCK were also positively correlated with their teaching experience. As a result, investigating teachers' perceptions of TPACK may help determine their inclination to integrate technology into their classrooms (Cetin-Berber & Erden , 2015).

In the context of a developing country, a Pakistani study highlights TPACK and ICT, the new hope for Pakistan's education system, indicating teachers in Pakistan have a positive perception and attitude towards ICT and TPACK (Hussain, Fakhar-Ul-Zaman, Kanwal, Nawaz, & Thaheem, 2024). Another study on Pakistani teachers examined the correlation among six TPACK domains for pre-service teachers of BEd. (Honors) Program, which found positive correlations across all domains (Rahim, Jalani, Ur Rahim, Bano, & Hussain, 2024). Additionally, a study in the context of Indonesia highlights the perspective physics teachers show strong competence in integrating technology into teaching, with excellent performance in TK, TPACK, and related areas. However, their CK and PK were rated as sufficient, signaling a need for improvement in subject mastery and pedagogy (Bani, 2024). The study of Ahsan, et al. (2022) explored the relationship between technology-Enhanced Teaching and Learning (TPACK) and demographic factors in Bangladesh, aiming to understand the complex interplay between TPACK and demographics. The study revealed that male teachers had better perceptions of overall classroom management and technology integration compared to female teachers (Ahsan, et al., 2022).

The research by Rouf & Mohamed, (2016) on teachers' technological skills in secondary education in Bangladesh resulting teachers exclusively used technology for PowerPoint. For record-keeping, evaluation, and feedback, no teacher used technology. Despite having the ability to create and utilize PowerPoint presentations, the majority of teachers preferred getting pre-made digital content (DC) from various sources, such as Teacher Batawan of the

Ministry of Education, and using them in Microsoft PowerPoint. Unfortunately, Bangladesh faces a shortage of technologically qualified teachers, many of whom are uncomfortable in using technology in the classroom due to a lack of technology (computer) literacy (Khan, Hassan, & Clement, 2012).On the other hand, positive teacher perceptions regarding technology are considered crucial for effective teaching and learning (Çelik & Keskin, 2009).

It is evident from the literature of TPACK that many studies have explored various aspects of TPACK and technology integration in education (Alayyar, Ghaida, Fisser, & Voogt, 2012; Archambault & Barnett, 2010; Banu, 2012; Braun & Clarke, 2006; Fereday & Muir-Cochrane, 2006; Lin, Tzu, Tsai, Chai, & Lee, 2013; Jimoyiannis, 2010; Celik, 2023; Eshet-Alkakay, 2011; Cetin-Berber & Erden , 2015; Chuang & Ho, 2011; Shin et al., 2009; Cox & Graham, 2009). However, there are few studies that can be found related to teachers' perception levels of TPACK in secondary education in Bangladesh. This study aims to explore the level of teachers' perceptions toward TPACK. It is anticipated that the findings of the current study may provide a better understanding of the scenario of teachers' perceptions regarding TPACK in Bangladeshi settings and assist authorities and the government in developing policies for TPACK and technology integration in teaching and learning. The scarcity of similar studies in secondary education in Bangladesh highlights the importance of this research in addressing this gap in the literature.

4. Research Objectives

The aim of this study is to explore teachers' perceptions of TPACK (Technological Pedagogical Content Knowledge) in secondary education in Bangladesh, focusing on the following objectives:

1. To assess the level of teachers' perceptions of TPACK in secondary education in Bangladesh.
2. To examine the relationship between teachers' background factors and their perceptions of TPACK.
3. To identify key factors influencing teachers' perceptions of TPACK.

5. Methodology of the Study

This study adopted a mixed methods research design to generate both qualitative and quantitative data. As the study was conducted on secondary teachers, therefore, all the teachers of secondary education in Bangladesh were the population of the study. To achieve the aim of this study, the sample of this study

was chosen through both probability and non-probability sampling methods, as shown in Table 1.

Table 1: Sample and Sampling Techniques used in the Study

Institutions and sample		Number	Sampling Techniques
Districts and Areas		3	Purposive Sampling
Schools	Rural	5	Convenience Sampling
	Urban	5	
Madrasahs	Rural	5	
	Urban	5	
Total Secondary Schools and Madrasas		20	
Teachers (Questionnaire Survey)		235	Simple Random Sampling
Head Teachers/ Assistant Head Teachers and Supers (Interview)		20	Purposive Sampling
Total		**255**	

A survey questionnaire and an in-depth interview schedule for teachers were used to generate in-depth information to collect data. Survey questionnaires were used to collect quantitative data, while qualitative data was gathered using prescheduled in-depth interviews. The data sets were managed and analyzed using the statistical packages for quantitative and qualitative data. For example, SPSS and MS Excel were used to analyze quantitative data generated by the questionnaire. Besides, qualitative data was analyzed following thematic analysis procedures.

6. Findings of the study

6.1. Teachers' Perceptions level of TPACK

A pre-scheduled scale was developed to measure teachers' perceptions of TPACK that contained 9 items. The scale reliability, i.e., the Cronbach's alpha value, was detected as given in Table 2 and showed an acceptable level of internal consistency ($\alpha = 0.693$), implying the scale could be used in the final analysis (Clark & Watson, 2019) for measuring the perception level of teachers towards TPACK.

Table 2: Items Descriptions and Scale Reliability of Teacher's Perception Level
towards TPACK

Variable	Item No	Item Descriptions	Scale Reliability
Teachers' Perceptions towards TPACK	1	Technology helps to increase academic performance (e.g. grades).	0.693
	2	TPACK helps teachers to feel more competent as educators.	
	3	TPACK enhances my professional development.	
	4	TPACK eases the pressure on me as a teacher.	
	5	Makes classroom management more difficult.	
	6	TPACK helps accommodate students' individual learning style.	
	7	Technology integration motivates students to get more involved in participation.	
	8	TPACK promotes the development of communication & interpersonal skills.	
	9	TPACK helps to demonstrate critical concept and ideas of content.	

In the next step, teachers' perception level towards TPACK was identified, categorizing the scale values into three levels explaining low, moderate, and good levels of perception. Figure 4 indicates good level to moderate levels of perception possessed by the teachers, implying their positive perception of using and integrating TPACK that is expected to accelerate the teaching and learning process and make teachers more technically efficient, which is the demand of the rapid change of the 21st century.
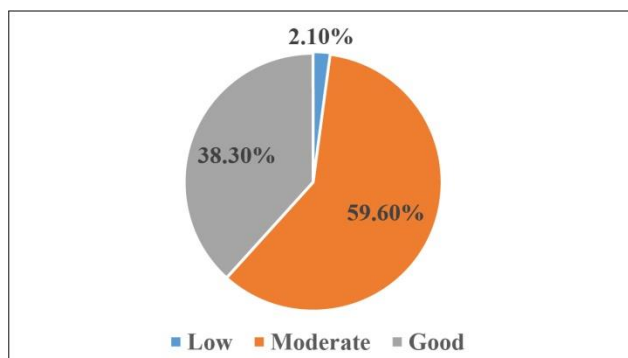

Figure 4: The Level of Perceptions towards TPACK
(Source: Primary data collected from field work)

The pie chart (Figure 4) depicts the findings of teachers' perceptions of TPACK. Most of the teachers (59.60%) had moderate levels of perceptions towards TPACK. Very few participants (2.1%) were found who negatively perceived TPACK and had low perceptions regarding TPACK. The good perception level towards TPACK possessed 38.30% teachers.

6.2. Relation between Teachers' Background Factors and Their Perceptions towards TPACK

Relationships between teachers' perceptions of TPACK and their background factors were measured using linear regression, which is shown in Table 3 and Table 4. The model summary of regression analysis reveals that 10.6% of the variation in teachers' perception of TPACK can be explained by their background factors.

Table 3: Model Summary of Linear Regression

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Sig. F Change
1	.326[a]	.106	.066	4.27164	.004
a. Predictors: (Constant), Computer Access, Gender, Teaching subject, Experience, Professional degree, Qualification, Source of skill acquisition, Age, Subject specialization, Computer skill					

Table 4 represents the coefficients of the background factors implying that only teachers' age and their access to computer have statistically significant association with teachers' perception of TPACK.

Table 4: Coefficients of Teachers' Background Factors

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta (β)	t	Sig.(p)
1	(Constant)	27.975	1.775		15.758	.000
	Age	0.898	0.374	0.216	2.400	.017
	Computer access	2.347	0.726	0.266	3.233	.001
a. Dependent Variable: Perception score						

According to Table 4, significant association between teachers' perceptions of TPACK and their age suggests that younger teachers tend to have more favorable

perceptions towards the use of technology in the classroom compared to older teachers and this group of teachers is more interested in applying their technological knowledge and skills in their teaching. Significant association is observed between the teachers' access to own computer and their perceptions of TPACK explaining that teachers' prior technological knowledge ameliorate them in using and integrating TPACK.

6.3. Key Factors Identified from Qualitative Data Influencing Teachers' Perceptions of TPACK

Teachers were interviewed to obtain more in-depth information identifying influencing factors of teachers' perception towards TPACK. Four different themes were identified from the analysis of qualitative data as interpreted below.

Theme 1: Teachers' Workload

Workload is identified as a crucial factor from the qualitative data, implying more than half of the teachers' perception of TPACK was not very positive. The teachers express their view toward TPACK, acknowledging-

Table 5: Increased Workload is one of the Reasons that Lower Teachers' Perceptions of TPACK

Views	N (%)
Integrating technology increases teachers' workload.	N = 12 (60%)
It requires more time to prepare technological materials compared to traditional classes.	N = 12 (60%)
Teachers are too busy with everyday classwork to consider incorporating technology into their daily lessons.	N = 10(50%)
Teachers face difficulties in using the technology and choosing particular teaching content to teach with technology.	N = 12 (60%)
They argued they need more preparation time.	N = 12 (60%)

It is, therefore, clear from Table 5 that teachers from both schools and madrasahs concurred that utilizing technology resulted is a greater workload for them, and they also claim that they faced less workload in traditional one way teaching and learning methods. This is the key reason teachers possess a low perception towards TPACK. Although 2.1% teachers had comparatively low perception toward TPACK according to the quantitative result, the qualitative result shows different findings, almost 60% teachers acknowledge that integrating technology added to their workload and requires them to prepare technological materials more thoroughly than they did traditional ones. That is why they have low

perception towards TPACK as they faced less workload in traditional one way teaching learning method. A few of teachers reported that they were too busy to consider incorporating technology into their daily lessons. The 12 teachers who faced difficulties while choosing the technology that would be used in the classroom for particular content. They argued they should have given the more preparation time. Teachers from both school and madrasah concurred that utilizing technology in a greater workload. Two of the head teachers from Urban Madrasah said,

"The most frequent issue mentioned by all of the teachers is the lack of time they have to use technology to organize content, explore numerous websites on the Internet, and require work load." (Teacher, Rural Madrasah)
"It took longer to prepare the teaching materials that it did to prepare traditional classes". (Urban School Head Teacher)

Regarding using technology in teaching another teacher said,

"Every time I try incorporating technology, I feel like I'm adding another full-time job to my plate. Preparing lesson with technology takes so much longer than my usual planning. I want to, but there just aren't enough hours in the day". (Urban School Teacher)

Theme 2: Curriculum

Curriculum (10%) is identified as a robust factor that is influencing teachers' perceptions towards TPACK. The following crucial points originated about curriculum from the in-depth interviews with teachers.

Table 6: Curriculum is one of the Factors Behind Teachers' Perceptions of TPACK

Views	N (%)
Proper instruction of technology integrating for teachers should be included in the curriculum.	10%(N=2)
Flexibility or self-paced instruction should be allowed in the curriculum.	10%(N=2)
Proper instruction about technology integration in teaching needs to be included in the teacher training curriculum.	10%(N=2)

The theme indicates that teachers' perceptions towards TPACK can be boosted if the curriculum is developed considering the above key points. One of the teachers' views is illustrated below echo similar foresight.

"I think the TPACK approach should be considered while designing an ICT curriculum. Proper instruction regarding the integration of technology should be

incorporated into teacher curriculum too. How teachers use technology effectively in classrooms that should be instructed in the curriculum, and master trainers must explain it clearly in their training sessions" (Urban Madrasah Super).

This comment indicates that if the curriculum is developed with proper instruction of integrating technology for teachers and teacher educators, the perception of teachers about TPACK can be boosted. Although the curriculum should have the proper instruction about technology integration, Self- paced instruction should be allowed. The research identified an identifiable feature in all of the participant responds to the open- ended questions: Self-paced instruction. Two of the participants in urban school opined,

"I like the flexibility (self-paced instruction) to adjust my lessons to meet the needs of my learners" (Head Teacher, Urban School).

"Every teacher has a different teaching style. Allowing for self-paced instruction would help us feel more comfortable with the technology". (Head Teacher, Rural School)

Theme 3: Teachers' Expectations and Beliefs

Teachers' expectations from authority and their beliefs are also recognized as robust factors, as teachers' perceptions of TPACK vary to some extent based on their expectations and religious beliefs. It is observed from the interview that 55% (N = 11) teachers expect the following necessary administrative supports for integrating technology in teaching that can boost up their technological knowledge and skills, motivation, and positive perception towards TPACK.

- Adequate ICT-based materials that include multimedia, contents, video lectures, and tutorials.
- Proper infrastructure for effective use of ICT in teaching.
- Technical supports that include uninterrupted internet, electricity, a classroom with a proper arrangement of ICT-related equipment, help desk support, and onsite support to fix hardware issues with printers, servers, or networking equipment.
- Administrative supports, for example, head teachers' prompt action, resource management, budget, support service.
- Training for continuous professional and skill development is not adequate to integrate technology in teaching and learning activities.
- Administrative factors can affect the perceptions of teachers to use their TPACK.

A lack of support in providing technological supplies and materials from the administration may contribute to teachers' negative perception of TPACK. The following narrations highlight teachers 'views about their expectations.

"If the required resources of ICT are not available, technology integration in teaching will be challenging. Teachers have to arrange or buy materials on their own initiative, which certainly makes it difficult for them and loses their motivation." (Head Teacher, Rural School)

"A sufficient number of full-time technical and administrative supports are essential components for effective integration of technology in class. It helps to amplify teachers' positive perceptions of TPACK." (Assistant Super of Urban Madrasah).

Teachers' perception of TPACK is also influenced by their religious beliefs and values. Many madrasah teachers claim that their madrasah authorities discourage them from using technology, as it may impact their religious practices. The view is reflected in the following narration.

"Sometimes the madrasa authorities discourage teachers from using certain types of technology due to concerns about religious issues. For example, displaying images of people, showing videos that feature women in front of male students or teachers, and using music is strictly prohibited. To adhere to these guidelines, some teachers choose not to use technology in their teaching" (Rural Madrasah Super).

The above discussion clearly portrays that teachers' expectations for administrative support and their religious beliefs can be regarded as influential factors in shaping their perceptions of TPACK.

Theme 4: Teachers' Remuneration

Teachers' remuneration was identified as one of the robust factors that hinder teachers' positive perception toward TPACK. Sharply half of the participants (50%, N = 10) have claimed that their perception of TPACK has become lower because:

- Educational institutes pay them low-level remuneration, which lowers teachers' satisfaction and causes hardship to maintain their living standard with this minimum range of remuneration.
- Despite receiving this little amount of remuneration, teachers are expected to put forth a lot of effort, have a pleasant attitude, and attend to the needs of learners.

- As their income from teaching is very minimal, they spend their after-school time in other jobs like private tutoring, shop keeping, or farming to generate extra income.

One of the supers of a madrasah in urban area said,

"*Teachers work a lot longer hours than the general public thinks. We work twelve hours a day, at the very least, and sometimes on the weekends as well. Honestly, a 60-80 hour workweek is not worth the little amount of pay. I believe my value to be far higher than that. So I have to do another work parallelly like tutoring, farming, etc. This is why I can't get more time to prepare technological materials for class next day."(Urban Madrasah Super)*

Teachers require breaks to grow professionally, and prepare themselves for next day class to integrate technology, yet because their income from teaching is very poor, they utilize their free time to look for job elsewhere in order to supplement their income, which lowers their perception toward TPACK implication. Two of the teachers' voices are illustrated below in favor of the above points.

"*Honestly, 60-80 hours work in a week is not worth the little amount of pay. I believe my value to be far higher than that. So I have to do other work simultaneously, like tutoring, farming, etc. This is why I can't get more time to prepare technological materials for everyday class." (Rural madrasah assistant super)*

"*Higher compensation will undoubtedly attract teachers more to work in improving their skills related to teaching that automatically improve their insight of TPACK*" (Teacher, Rural School).

To support the idea, one head teacher from a rural school urged,

"*The government would like to build a smart nation for a future smart Bangladesh. For building a smart nation, smart teachers are essential. Smart teachers cannot be made without a suitable amount of remuneration. Good students may not be willing to join the teaching profession if the compensation is not given in a proper way." (Rural School Head Teacher)*

Thus, there is no denying this conviction that upgrading teachers' remuneration has a direct impact on their perceptions towards TPACK. A flowchart, as shown in Figure 5, is created to present the factors at a glance that have direct impact on teachers' perceptions of TPACK.
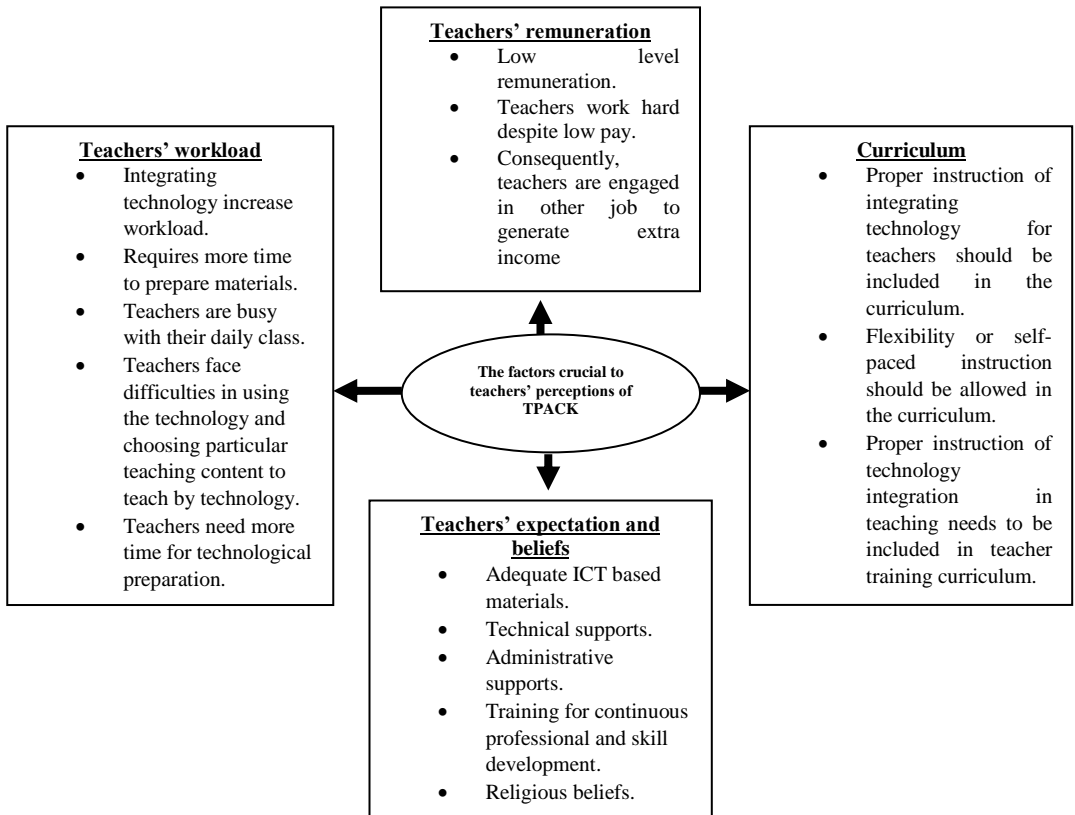
Teachers' remuneration
- Low level remuneration.
- Teachers work hard despite low pay.
- Consequently, teachers are engaged in other job to generate extra income

Teachers' workload
- Integrating technology increase workload.
- Requires more time to prepare materials.
- Teachers are busy with their daily class.
- Teachers face difficulties in using the technology and choosing particular teaching content to teach by technology.
- Teachers need more time for technological preparation.

The factors crucial to teachers' perceptions of TPACK

Curriculum
- Proper instruction of integrating technology for teachers should be included in the curriculum.
- Flexibility or self-paced instruction should be allowed in the curriculum.
- Proper instruction of technology integration in teaching needs to be included in teacher training curriculum.

Teachers' expectation and beliefs
- Adequate ICT based materials.
- Technical supports.
- Administrative supports.
- Training for continuous professional and skill development.
- Religious beliefs.

Figure 5: Flowchart of Influential Factors of Teachers' Perception of TPACK

7. Discussion

This study aimed to explore teachers' perceptions of technology, pedagogy, and content knowledge (TPACK) in secondary education in Bangladesh. Teachers of secondary schools and madrasahs (religious-based schools) participated in this study. The findings indicate that the majority of teachers had a moderate level of perceptions of TPACK. Just over a third of teachers have a good level of perception regarding TPACK. Conversely, we found that a very small percentage of teachers had low perceptions of TPACK. It is evident that positive teacher perceptions of technology integration are considered indispensable for effective teaching (Çelik, 2009). Teachers who perceive technology as less significant and

are not engaged in developing their Technological, Pedagogical, and Content Knowledge (TPACK) tend to utilize it less frequently in their teaching (Cedillo, 2003). Conversely, those teachers were willing to incorporate technology in their teaching activities, who believe that technology has a positive impact on their teaching and students learning (Sarhandi, Bajnaid, & Elyas, 2017; Mumtaz, 2020).

The findings of the study indicate that 10.6% of the variation in teachers' perceptions of TPACK can be attributed to their background factors (i.e. age and access to the computer). Trivial statistically significant associations were found between teachers' perception level, and their age, and computer access. A similar finding was observed for teacher age in Lee & Tsai's (2010) study, although reverse findings were derived in other studies (e.g., Cetin-Berber & Erden, 2015; Mai & Hamzah, 2016), where no significant correlation was found between the two variables. Teachers' perceptions of technology-enhanced instruction (i.e., TPACK, encompassing Technological Pedagogical Knowledge, Technological Content Knowledge, and Technical Knowledge) vary significantly according to their age(Fahadi & Khan, 2022). This implies that younger teachers with limited conventional knowledge are less likely to acquire high levels of TPACK than older teachers, who tend to have stronger conventional knowledge. Further, findings indicate that teachers' perceptions of TPACK were positively impacted by having their own personal computer or laptop (computer access). It is crucial to note that all teachers in Bangladesh are required to own a personal computer and possess strong computer skills for effective integration of technology, which certainly can accelerate their confidence and positive perception of TPACK.

The qualitative results of the study suggest that several factors influence teachers' perceptions of TPACK. More than half of the teachers surveyed believed that their workload and remuneration significantly affected how they perceived and implemented TPACK in practice. A substantial number of teachers emphasized that adequate remuneration was essential in fostering positive perceptions of TPACK. Without sufficient remuneration, it is challenging to cultivate effective teachers. Adequate remuneration is necessary to attract good teachers. Therefore, the government should consider increasing teacher salaries to allow them to focus fully on classroom instruction and effectively integrate technology, making classes both enjoyable and productive. Teachers also expressed that using technology increased their workload compared to traditional one-way teaching methods, where they feel less work pressure. Their negative perceptions of TPACK and technology integration reflect this attitude. This finding aligns with

the research of (Khan, Hassan, & Clement, 2012) indicating that a shortage of teachers in Bangladesh forces teachers to manage heavy workloads, leaving them little time to design, develop, and integrate technology into their teaching. A similar view is expressed by Strickland (2014), who concluded that teachers felt that incorporating technology required more planning and class time. The findings of the research also support the notion of the research done by Jimoyiannis (2010) that lesson preparation time for technology integration significantly impacts their use of technological pedagogical scientific knowledge in instruction. Many teachers perceived technology integration as time-consuming and demanding, which significantly influenced their perceptions of integration of technology following the TPACK format in teaching. Based on in-depth interviews of teachers, it is observed that teachers' expectation of institutional support plays a crucial role in enhancing teachers' technological skills (Kotrlik & Redmann, 2005; Robertson et al., 1996). Teachers need adequate support from the administration for integrating technology to foster positive perceptions of TPACK (Technological Pedagogical Content Knowledge). As many of the teachers claimed that they do not receive proper support from the administration, which consequently lowers their perceptions of TPACK. Teachers want to implement their technological skills and knowledge and also need to acquire more knowledge through professional training. One challenge teachers usually face is the need to purchase their resources for technology-based teaching, which lowers their interest and makes it difficult to apply the TPACK concept effectively when these tools are unavailable.

Additionally, an interesting finding was derived from the study that the madrasah administration occasionally discourages teachers from using technology due to conflicts with religious beliefs that include images of people, videos featuring women in front of male students due to the Purdah (covering) system, and certain types of music are strictly forbidden. To adhere to these religious standards, some teachers are unwilling to use technology in the classroom. This situation demonstrates how administrative factors of some educational institutes can influence teachers' perceptions of TPACK. Along with that, cultural and religious resistance significantly impacts the use of technological pedagogical content knowledge in instruction, highlighting the specific TPACK characteristics in particular contexts (Jimoyiannis, 2010).

Curriculum is an integral part of teaching, which guides teachers on how to teach and what to teach. The curriculum is identified as a key factor from the study that affects teachers' perceptions of TPACK. Teachers opined that the TPACK approach should be considered in curriculum design, allowing for self-paced

teaching while ensuring that the curriculum includes necessary guidance on technology integration. It is imperative to bring up that focusing this century as the era of science and modern technologies (Shaha & Rahman, 2015), the subject ICT was introduced at all levels of education in Bangladesh, i.e., government and non-government secondary schools, madrasahs, and technical education institutions equally since 2012 (Jabbar, 2015). To facilitate effective integration of ICT in the teaching process, the government of Bangladesh introduced an updated ICT curriculum for all levels of education with detailed instructions for teachers. However, teachers are still struggling to integrate ICT into their teaching due to a lack of proper training and insufficient administrative support at both school and government levels. In a nutshell, findings derived from the study will offer timely guidelines for policymakers, researchers, and educators.

8. Conclusion

The TPACK framework emphasizes that the foundation of successful ICT integration lies in the content (what is being taught) and pedagogy (how the content is delivered). This study explores teachers' perceptions of TPACK in Bangladeshi settings and their perceived challenges in adopting it. The findings reveal that these teachers have mixed perceptions, both positive and negative, toward TPACK. This underscores the importance of ensuring that teachers, students, policymakers, and other stakeholders recognize the value of technology in this rapidly changing globe and its potential to transform traditional teaching methods. Consequently, these results may provide a knowledge base to understand teachers' perceptions of TPACK in the context of Bangladesh. However, the study has limitations regarding sample size, context, the lack of diverse participants, and a non-longitudinal design to assess the progress of integrating the TPACK framework. Additionally, the research was conducted within a specific geographical and educational context, which may not translate to other regions with varying cultural and institutional factors. To gain deeper insights, future research should employ other types of research designs or methods, for example, longitudinal studies, diverse samples, and comprehensive measurement tools to explore the reciprocal effects of the development of different knowledge dimensions (Schmidt, 2009).

9. Recommendation of the Study

- The government should allocate extra funds for the purchase, maintaining materials, and infrastructure development for technology integration.
- Teachers in Bangladesh require a personal computer to use their ICT knowledge and skills in their teaching. Policymakers should take the step to

make a policy requiring all teachers to have access to personal computers, along with support for acquiring these devices (e.g., subsidies or low internet fees).

- The government should organize regular and effective hands-on training to improve teachers 'interest and motivation to use TPACK.
- Curriculum developers should work with educators to design curriculum and teachers' guides that incorporate specific and practical examples necessary for technological integration in the classroom.
- A massive campaign, workshops, and seminar should be arranged to understand the value of technology integration for effective teaching and students' learning.
- Establish a system for regular monitoring and evaluation of teachers' use of the TPACK, with feedback mechanisms to promote best practices.
- The Government should introduce a reward system where teachers receive financial assistance or bonuses for successful technology integration in their classrooms, along with increasing base salaries.

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Building Bridges, Building Futures: The Role of Rural Bridges in Bangladesh's Growth Story

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Abstract

The study focuses into the socio-economic impact of rural bridges in Bangladesh and their significant contribution to community development. Through comprehensive research and rigorous quantitative analysis, the study assesses various dimensions, including accessibility, economic opportunities, livelihood enhancement, and infrastructure development facilitated by rural bridges. The key findings underscore the indispensable role of bridge infrastructure in bolstering connectivity, curbing transportation costs, and catalyzing economic growth, thereby fostering inclusivity and alleviating poverty. Additionally, the study illuminates the positive effects of rural bridges on enhancing access to education, healthcare, and markets for rural populations. In light of these insights, the study puts forth actionable recommendations aimed at maximizing the benefits derived from rural bridges, with a focus on targeted interventions, sustainable infrastructure strategies, and meaningful community engagement. Ultimately, the study highlights the transformative potential of rural bridges in driving Bangladesh's development agenda forward and advancing socio-economic prosperity across rural landscapes.

Keywords: *Rural Bridges, Socio-Economic Impact, Community Development, Inclusive Growth, Infrastructure, Accessibility, Livelihoods, Sustainable Development.*

1. Introduction

In the narrative of Bangladesh's development journey, rural bridges emerge as significant landmarks, embodying resilience, connectivity, and progress. Against the backdrop of lush landscapes and meandering rivers, these structures symbolize more than mere physical crossings; they represent pathways to

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empowerment and opportunity for rural communities (Asadullah et. al., 2014; Khandker, 2010). As Bangladesh strives towards sustainable growth and socio-economic prosperity, understanding the pivotal role of rural bridges in shaping the trajectory of rural development becomes paramount.

This research aims to focus into the profound significance of rural bridges in Bangladesh's growth story under the overarching theme of "Building Bridges, Building Futures."   By exploring their impact on accessibility, economic opportunities, livelihood improvement, and infrastructure development, this study seeks to unravel the transformative potential of rural bridges in advancing Bangladesh's development agenda and promoting socio-economic well-being across its rural landscapes (Mujeri & Mujeri, 2020: Ripon et. al., 2020).

Through rigorous analysis and empirical evidence, this research endeavors to shed light on how rural bridges serve as catalysts for inclusive growth, poverty alleviation, and community empowerment in rural Bangladesh.

2. Problem Statement

In the saga of Bangladesh's growth story, the pivotal role of rural bridges emerges as a beacon of promise amidst a landscape marked by challenges and opportunities. However, despite their undeniable significance, rural bridges face a myriad of obstacles that impede their optimal contribution to the nation's development trajectory (Fontanez, 2020; Rahman, 2020).

First and foremost, the inadequate infrastructure and maintenance of rural bridges hinder seamless connectivity between rural communities and urban centers. Many of these bridges suffer from structural deficiencies, leading to frequent closures and disruptions in transportation networks (Rahman, 2021; Ripon et. al., 2020). Consequently, the flow of goods, services, and people is hampered, stifling economic activities and limiting access to essential resources.

Furthermore, the geographical diversity of Bangladesh presents unique challenges in the construction and upkeep of rural bridges. From the sprawling deltas of the Ganges-Brahmaputra-Meghna basin to the rugged terrain of the Chittagong Hill Tracts, varying environmental conditions necessitate tailored engineering solutions and heightened resilience measures (Sen, 2007; Beutel et., al., 2019; Islam et., al., 2023). Failure to address these challenges can result in costly repairs, prolonged downtimes, and compromised safety standards.

Moreover, the financial constraints faced by local government bodies often pose significant barriers to the timely completion and maintenance of rural bridge projects (Schroeder, 2019). Limited budgets and competing priorities force decision-makers to make difficult trade-offs, potentially sacrificing the quality

and longevity of bridge infrastructure for short-term savings (Emran & Shilpi, 2023; Islam et., al., 2024). This not only undermines the efficacy of development efforts but also perpetuates a cycle of dependency on external funding sources.

Additionally, the lack of comprehensive data and monitoring mechanisms hampers evidence-based decision-making and accountability in rural bridge development initiatives (Emran & Shilpi, 2023). Without accurate information on usage patterns, structural integrity, and socio-economic impact, policymakers struggle to allocate resources effectively and evaluate the effectiveness of interventions. As a result, investments in rural bridges may fail to yield the anticipated returns, exacerbating disparities and inhibiting inclusive growth.

In light of these challenges, it is evident that the role of rural bridges in Bangladesh's growth story is both pivotal and precarious. Addressing the aforementioned issues requires a concerted effort from all stakeholders, encompassing improved infrastructure planning, sustainable financing mechanisms, enhanced technical capacity, and transparent governance structures. Only through collective action and strategic investments can rural bridges truly fulfill their potential as catalysts for progress and prosperity in Bangladesh's evolving narrative of development.

3. Research Objectives

1. To evaluate the socio-economic impact of rural bridges on local communities in Bangladesh, with a specific focus on enhancing access to essential services such as markets, healthcare, education, and employment opportunities, thereby contributing to overall community development and well-being.
2. To assess the effectiveness of rural bridges in promoting agricultural productivity and rural livelihoods by examining their role in improving market access for farmers, thereby fostering sustainable rural economies and poverty alleviation.
3. To investigate the efficiency and efficacy of rural bridge infrastructure in reducing transportation costs and travel time for rural residents, thereby enhancing mobility and connectivity within rural areas, improving access to economic opportunities, and fostering social integration and cohesion.

4. Theoretical Framework

The study is grounded in the theory of socio-economic infrastructure development. This framework emphasizes the critical role infrastructure, particularly rural bridges, plays in enhancing economic growth, social mobility, and regional integration. The connectivity provided by rural bridges links remote

areas with markets, services, and employment opportunities, thus facilitating rural development and poverty reduction (Khandker & Koolwal, 2010; Emran & Shilpi, 2023).

Drawing on modernization theory, which highlights infrastructure as a key driver of development, the article explores how rural bridges contribute to economic expansion and social progress (Mujeri & Mujeri, 2020; Asadullah, Savoia, & Mahmud, 2014). Additionally, it incorporates elements of the sustainable development paradigm, recognizing the need for environmentally conscious infrastructure that supports long-term economic resilience and social inclusion (Rahman, 2021; Ripon & Al-Mamun, 2020). By framing rural bridges as catalysts for inclusive growth, this theoretical perspective underscores the multifaceted impact of infrastructure on development trajectories in Bangladesh.

5. Methods

The field survey method was employed to collect reliable and representative quantitative data from a diverse group of beneficiaries across the 98 Upazilas under 44 districts in Bangladesh, ensuring comprehensive coverage and accuracy in assessing the project's impact across various regions and professions.

5.1 Direct Field Survey

For the field survey, a structured direct interview approach was used to collect quantitative data from beneficiaries across 98 upazilas in 44 districts within 8 divisions of Bangladesh.

Sample, $n = \{N*X/(X+N-1)\} \times Design\ Effect$

Where, $X = \dfrac{Z^2 \times P \times (1-P)}{MOE^2}$

$$X = \frac{(1.96)^2 \times 0.30 \times (1-0.30)}{0.05 \times 0.05} = 322.68$$

The following sample sizes were determined using the above information-

n = 322.68× 3.59 = 1158.47~ **1160** round figure.

Thus sample Size, *n = 1160*

Where, n = sample size
N = total population of the sample area, which is 151.83 million for 98 upazilas across 44 districts (Agricultural and Rural Statistics Survey, May 2019).
Z = standardized normal variate, set at 1.96 for a 95% confidence interval.
P = Sample Proportion Probability, assumed to be 30% (0.30) based on the project's physical progress and beneficiary estimation. Thus, P = 0.30 and 1 – P = 0.70.
MOE = Margin of Error, set at 5% (0.05).
Design Effect = Variance ratio, set at 3.59 for this study to account for the sampling design and ensure effective monitoring of the project.

A sample size of 1,160 beneficiaries was determined using Daniel's (1999) formula with Finite Population Correction (FPC), ensuring a 95% confidence level and a 5% margin of error. The calculation accounts for population size, standard deviation, sample proportion probability, margin of error, and design effect.

A sample size of 1,160 beneficiaries has been calculated to effectively represent the project area's population. This sample spans all 8 divisions of Bangladesh, covering 30 out of 44 districts, and includes 50 respondents near each union bridge in remote upazilas. The respondents come from diverse professional backgrounds, such as local dignitaries, teachers, chairmen, traders, farmers, fishermen, and drivers.

5.2 Selection and Distribution of Sample Area

The selection process uses a multistage approach to ensure inclusivity and representation. First, 30 districts (68.18% of the total) are selected, and from these, 1,160 beneficiaries are chosen from 50 upazilas through random sampling. Beneficiaries are then selected from two unions per upazila using stratified sampling, and respondents from each village are chosen via systematic random sampling. This method ensures comprehensive data collection for assessing the socio-economic impact, effectiveness, and efficiency of rural bridge infrastructure in Bangladesh.

6. Findings and Discussion

Data collected from 1,160 respondents were analyzed to assess project activities and the socio-economic status of participants during the intensive monitoring phase. The respondents, 20 from each of the 50 upazilas across 8 divisions, provided insights into their socio-economic status and opinions.

6.1 Age of Respondents

Field data shows that all 1,160 respondents were included in the analysis with no missing values. The average age is 40.37 years, with a standard deviation of 11.77 years, indicating variability around this mean. Respondents' ages range from 14 to 75 years.

Table 1: Age of Respondents

N	Valid	1160
	Missing	0
Mean		40.37
Std. Deviation		11.766
Minimum		14
Maximum		75

Overall, this analysis provides insights into the age distribution of the surveyed respondents, highlighting the average age, variability, and range of ages within the sample population.

6.2 Gender Distribution of Respondents

Data analysis shows that of the 1,160 respondents, 22.1% (256) are women, while 77.9% (904) are men, indicating a significant gender imbalance. Men outnumber women nearly four to one, which may affect the representativeness of the findings, as women's perspectives could be underrepresented.
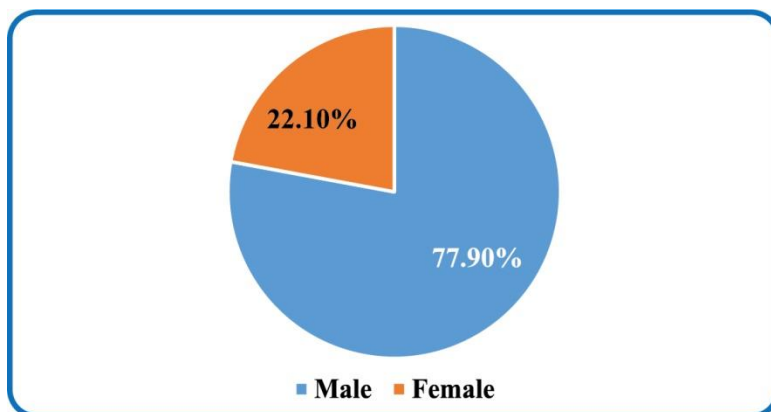

Figure 1: Gender of the Respondents

6.3 Occupational Distribution of Respondents

The analysis of 1,044 sample beneficiaries reveals diverse occupations within the surveyed population. Key findings include 15.7% as car drivers, 1.3% as salaried employees, 17.0% involved in trading, and 15.7% in small-scale trading. Agriculture is the most common occupation, with 35.4% engaged in farming, followed by 3.6% in poultry, cattle, and goat rearing. Other occupations include 0.6% in fish farming, 0.4% in cottage industries or tailoring, 5.4% as students,

and 4.8% as laborers. This highlights the varied livelihoods within the community.
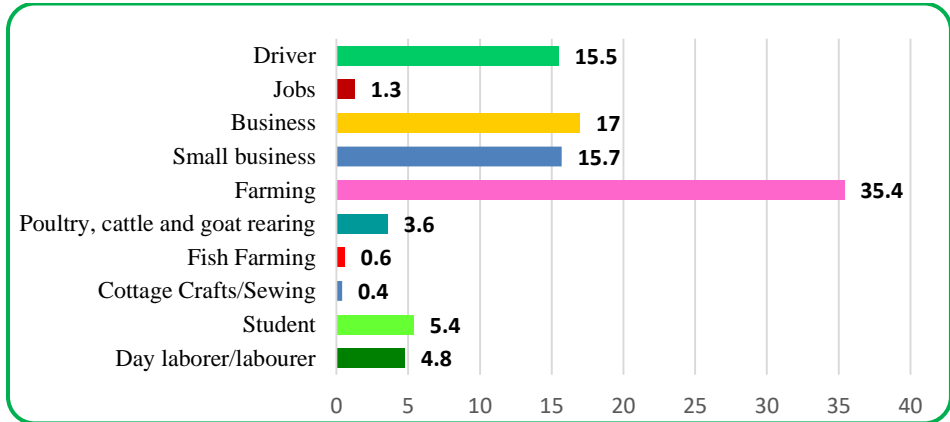

Figure 2: Occupational Distribution of Respondents

6.4 Educational Qualification of Respondents

The analysis of 1,158 sample beneficiaries reveals varied educational attainment. Of the respondents, 32.6% are illiterate, 31.3% have completed class 1-5, and 13.8% have education ranging from class 6-10. Additionally, 10.7% have passed the SSC exam, 4.8% have HSC qualifications, and 6.7% hold Honors, Bachelor's, Master's, or equivalent degrees. This breakdown highlights the diverse educational backgrounds and the need for targeted interventions to address different educational needs for socio-economic development.

Table 2: Educational Qualification of Respondents

		Frequency	Percent	Valid percent
Valid	Illiterate	378	32.5	32.6
	Class I- class V	362	31.2	31.2
	Class VI- class XI	160	13.8	13.8
	SSC pass	124	10.7	10.7
	HSC/Equivalent	56	4.8	4.8
	Hons/Degree/Masters	78	6.7	6.7
	Total	**1158**	**99.8**	**100.0**
Missing	system	2	.2	
Total		**1160**	**100.0**	

6.5 Number of Earning Members of the Family

The analysis of 1,160 sample beneficiaries shows that 59.7% of families rely on a single earning member, 30.3% have two earning members, 9.8% have three, and only 0.2% have four earning members. This distribution highlights the varying economic support structures within beneficiary families, emphasizing the need to consider family composition in socio-economic interventions.
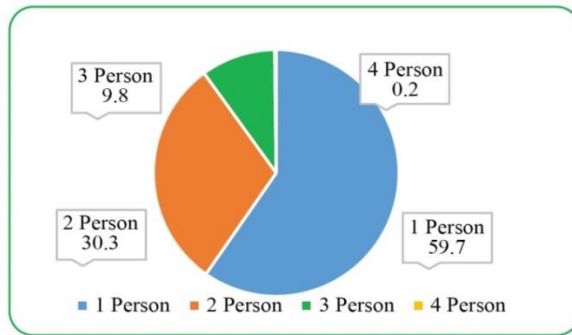

Figure 3: Number of Earning Members of the Household

6.6 Information on Monthly Average Income of the Family

The analysis of 1,160 beneficiaries shows that 66.9% of families have an average monthly income between 5,000 and 20,000 Tk, while 21.6% earn between 20,001 and 35,000 Tk. Additionally, 10.5% report incomes from 35,001 to 50,000 Tk, and 1.0% have incomes above 51,000 Tk. This highlights the diverse economic circumstances within the beneficiary community, underscoring the need for targeted interventions across different income levels.
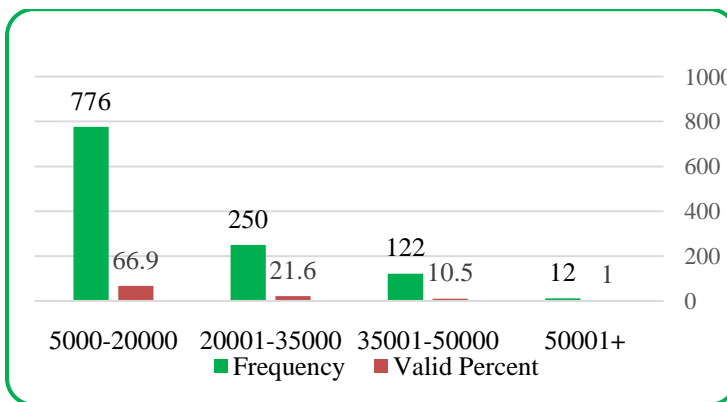

Figure 4: Data on Average Monthly Household Income

6.7 Information on the Concept and Requirements of a Bridge Construction Project on Rural Roads

The analysis of 1,160 beneficiaries shows that 100% were aware of and recognized the necessity of the bridge construction project on rural roads. This high level of awareness highlights the project's significance and visibility, reflecting strong community engagement and support for infrastructure development aimed at improving rural connectivity and socio-economic conditions.

6.8 Information Regarding the Increase in Traffic between Upazilas and Unions after the Construction of the New bridge

The analysis of 1,014 beneficiaries shows that 98% observed an increase in traffic following the construction of a new bridge, indicating improved mobility between the upazila and the union. However, 2% noted no increase in traffic due to the absence of new connecting roads, highlighting the need for comprehensive infrastructure planning to ensure effective connectivity
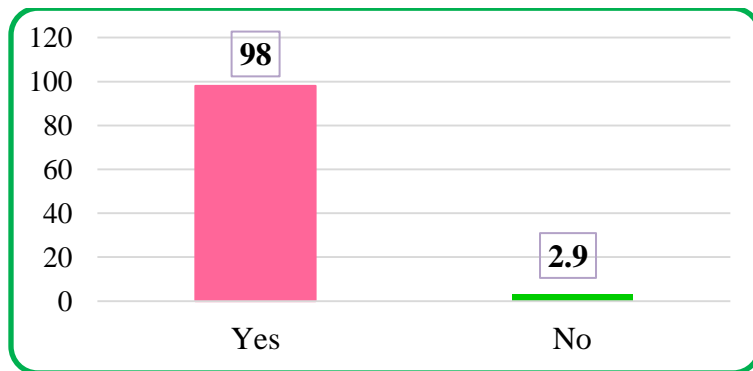

Figure 5: Data on Average Monthly Household Income

6.9 Information on Site/Location Accuracy of the Bridge

The analysis of 1,140 beneficiaries reveals that 98.2% were satisfied with the bridge's location, indicating strong agreement on its suitability for the community's needs. However, 1.8% expressed dissatisfaction, highlighting the importance of addressing community feedback to ensure the success and acceptance of infrastructure projects.
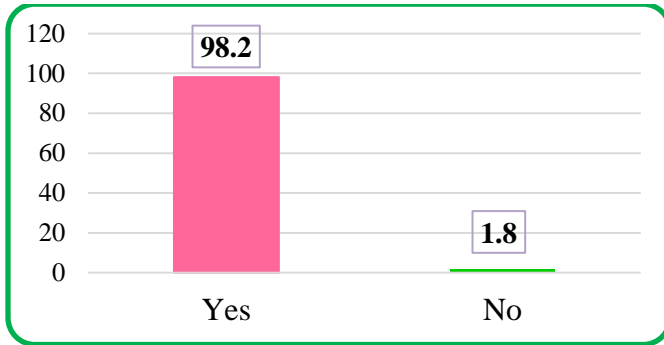
Figure 6: Site/Location Accuracy of the Bridge

6.10 Information Regarding the Need for any Further Bridge Construction in the Area

The analysis of 1,136 beneficiaries reveals that 25.2% believe there is a need for bridge construction in the area, while 74.8% think no additional bridges are needed. This highlights diverse opinions within the community, with some seeing a need for improved connectivity, while others feel the existing infrastructure is sufficient. Understanding these viewpoints is essential for aligning infrastructure projects with local priorities.
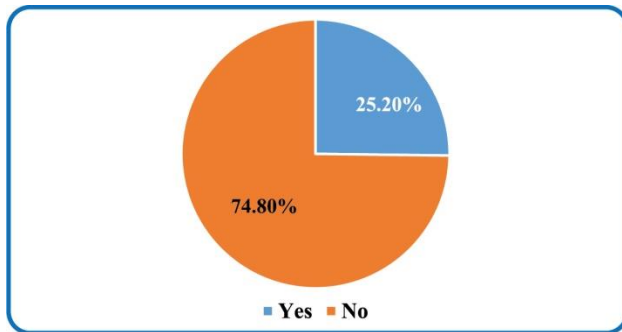
Figure 7: Need for Further Bridge Construction in the Area

6.11 Information About How People in the Area can Travel to the Upazila/Union before the Bridge is Constructed

The analysis of 1,120 beneficiaries shows that before the bridge was constructed, 82.1% used boats as their primary mode of transportation, 3.8% used launches, 10.5% relied on bamboo or wooden boats, and 3.6% used other unspecified means. This highlights the diverse and rudimentary transportation methods in

place prior to the bridge, emphasizing its transformative impact on improving accessibility and connectivity.
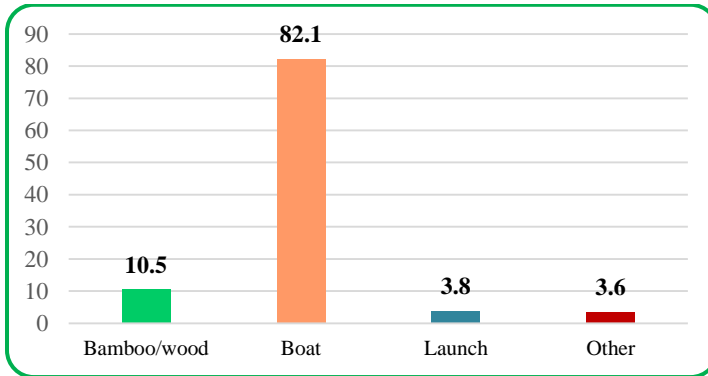
Figure 8: Traffic in the Area before the Bridge

6.12 Information Regarding Acquisition of Land for Construction of Bridges

The analysis of 966 beneficiaries reveals that 35% had their land acquired for bridge construction, while 65% did not. This highlights the varied experiences of land acquisition among beneficiaries, with some directly impacted and others unaffected. Understanding these dynamics is essential for evaluating the social and economic effects of infrastructure projects and ensuring fair outcomes for all stakeholders.

Figure 9: Land acquisition for Bridge Construction

6.13 Information on Receipt of Compensation for Land Acquisition

The analysis of 458 beneficiaries shows that 38.9% received compensation for land acquisition, while 61.1% have not. This highlights disparities in compensation distribution, with many beneficiaries still waiting for payment. Addressing these delays is crucial for ensuring fairness and maintaining community trust in infrastructure projects.
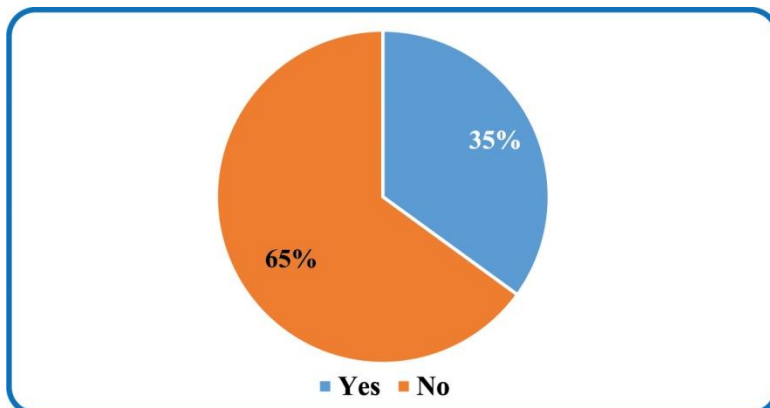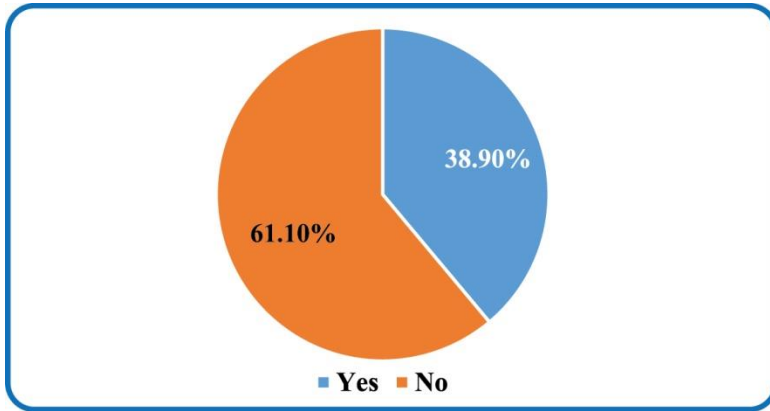

Figure 10: Receipt of Compensation for Land Acquisition

6.14 Information on whether the Compensation Amount was Adequate/Proper Value of the Land

The analysis of 294 beneficiaries reveals that 93.7% were satisfied with the compensation for land acquisition, finding it adequate, while 6.3% felt the compensation was insufficient. This underscores the need for fair and transparent compensation processes that reflect market value to address grievances and support infrastructure projects.

6.15 Information about the Time Taken to Travel to the Upazila/Union before the Construction of the Bridge

Travel times varied significantly, with 19.1% of respondents reporting a travel time of 1 hour and 25.5% reporting 1 hour 20 minutes. Shorter travel times (30 minutes) were reported by 15.2%, while longer travel times ranged up to 3 hours for some respondents.
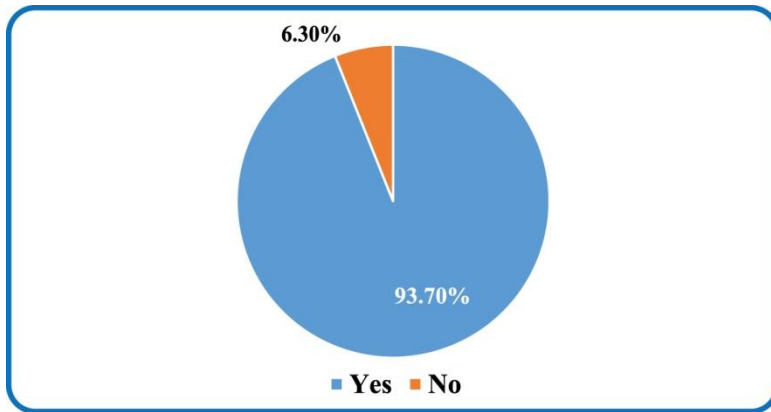
Figure 11: Fair Value of Land and Compensation

Table 3: Information on how long it took to travel to the Upazila/Union before the Construction of the Bridge

	Travel time	Frequency	Percent	Valid percent
Valid	1 hour	222	19.1	19.1
	1 hour 15 minutes	20	1.7	1.7
	1 hour 20 minutes	296	25.5	25.5
	1 hour 30 minutes	48	4.1	4.1
	1 hour 50 minutes	40	3.4	3.4
	2 hours	148	12.8	12.8
	2 hours 10 minutes	74	6.4	6.4
	2 hours 20 minutes	32	2.8	2.8
	2 hours 30 minutes	40	3.4	3.4
	3 hours	20	1.7	1.7
	30 minutes	176	15.2	15.2
	40 minutes	20	1.7	1.7
	50 minutes	24	2.1	2.1

6.16 Information about How Long It will Take to Reach the Upazila/union After the Bridge is Constructed/Constructed

The majority of respondents anticipate a substantial reduction in travel time. The most common expectation is 10 minutes (39.0%), with other estimates ranging from 5 minutes to 45 minutes. Notably, 8.3% expect a 5-minute travel time, showcasing the bridge's transformative impact on reducing travel durations and enhancing accessibility

Table 4: Information on How Long the Bridge will Take to Reach the
Upazila/Union After Construction/Construction

		Frequency	Percent	Valid percent
Valid	1 hour 15 minutes	32	2.7	2.7
	10 minutes	452	39.0	39.0
	15 minutes	20	1.7	1.7
	20 minutes	122	10.5	10.5
	25 minutes	60	5.2	5.2
	30 minutes	280	24.1	24.1
	40 minutes	40	3.4	3.4
	45 minutes	58	5.0	5.0
	5 minutes	96	8.3	8.3
	Total	**1160**	**100.0**	**100.0**

6.17 Information about whether the Upazila/Union where the Bridge is being Constructed is Easy to Reach

The analysis of 1,160 beneficiaries reveals that 97.4% find it easier to reach the Upazila/Union areas since the bridge was constructed. This overwhelming consensus indicates that the bridge has significantly improved connectivity, making access to essential services, markets, and opportunities more convenient. The findings highlight the bridge's positive impact on accessibility and its role in promoting socio-economic progress and community well-being.
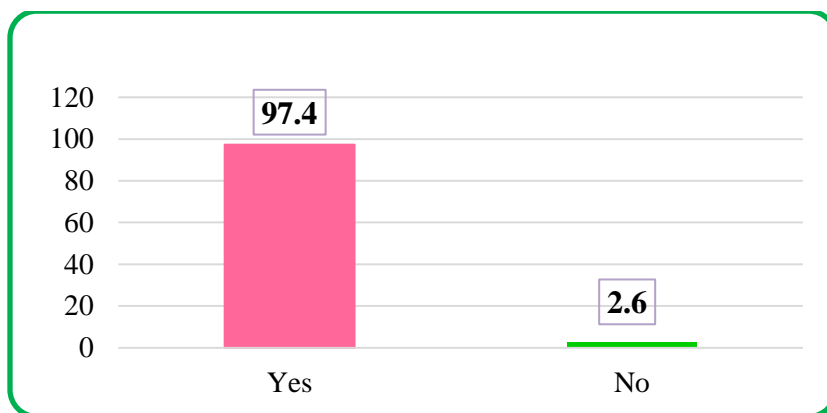

Figure 12: Accessibility of Upazila/Union where the Bridge is to be Constructed

6.18 Information Regarding Expansion of Trade and Commerce due to Construction of Long Bridge on Rural Roads

The analysis of Figure 13, based on responses from 1,160 beneficiaries, reveals that 98.3% of respondents believe that the construction of long bridges on rural roads has significantly increased or will increase trade activities. This strong consensus highlights the perceived economic benefits of improved rural infrastructure, suggesting that such bridge projects are crucial for boosting trade, stimulating economic activity, and supporting socio-economic development in rural areas.
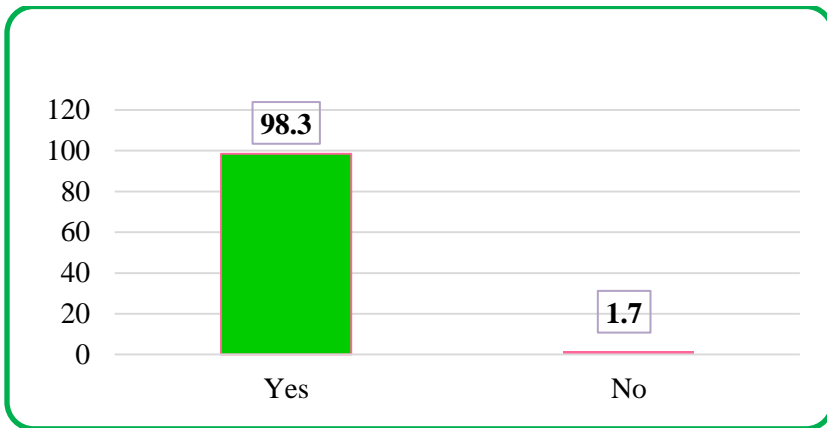
Figure 13: Expansion of Trade and Commerce Due to Construction of Long Bridge on Rural Roads

6.19 Information Regarding the Improvement of the Law and Order Situation After the Construction of the Bridge on the Upazila and Union Roads

Analysis of Figure 14, with responses from 1140 beneficiaries, shows that 98.2% believe bridge construction improves law and order in Upazila and Union areas, highlighting the perceived safety benefits. However, 1.8% hold contrary views, emphasizing the significance of infrastructure projects for community well-being and safety. These findings highlight the importance of infrastructure projects not only in enhancing physical connectivity but also in fostering a conducive environment for community well-being and safety.
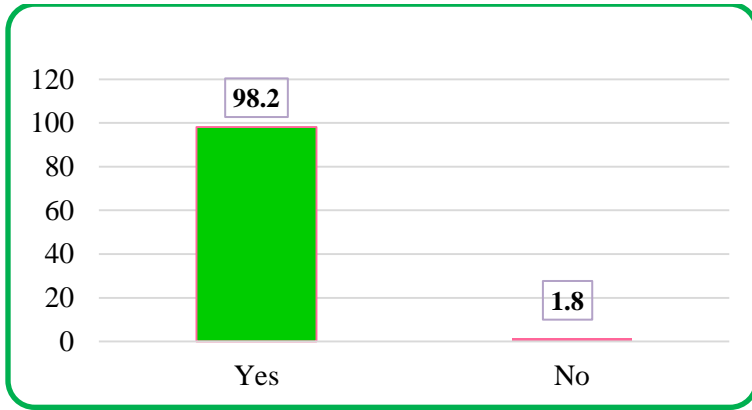
Figure 14: Improvement in Law and Order Situation After Construction of the Road Bridge

6.20 Ease of Transportation of Boys and Girls to School/College After Construction of the Bridge

Analysis of Figure 15, with responses from 1160 beneficiaries, reveals a strong consensus regarding the impact of bridge construction on education. A significant majority, comprising 98.3% of respondents, believe that the construction of the bridge has or will facilitate the movement of boys and girls to school or college. This finding underscores the perception that improved infrastructure enhances access to education, potentially fostering educational opportunities and societal development in the region.
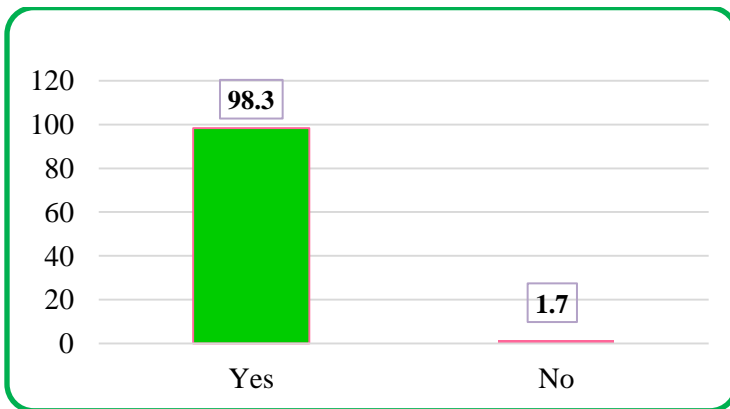
Figure 15: Ease of Transportation of Students to School/College due to Construction of the Bridge

6.21 Information on Collapses/Deflections on Approach Roads to Bridges

Analysis of Figure 16, based on responses from 442 beneficiaries, shows that 30.8% reported the collapse or damage of the bridge link road or approach road, while 69.2% noted that these roads remained intact. This highlights the need for ongoing maintenance and monitoring to ensure the structural integrity and safety of bridge access roads.
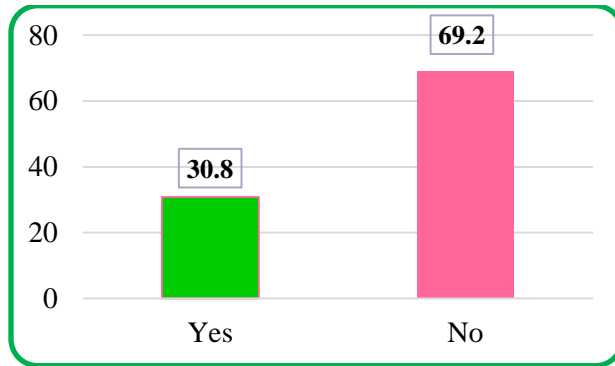
Figure 16: Collapse/Debacle on Bridge Approach Road (Approach Road)

6.22 Information Regarding Provision of Postguard (Poles/Pillars) on Bridge Link Roads

Analysis of Figure 17, based on responses from 628 beneficiaries, reveals that 90.8% reported the presence of post guards (posts/pillars) along bridge link roads, enhancing safety and defining road boundaries. However, 9.2% noted their absence, indicating areas where safety measures might need improvement
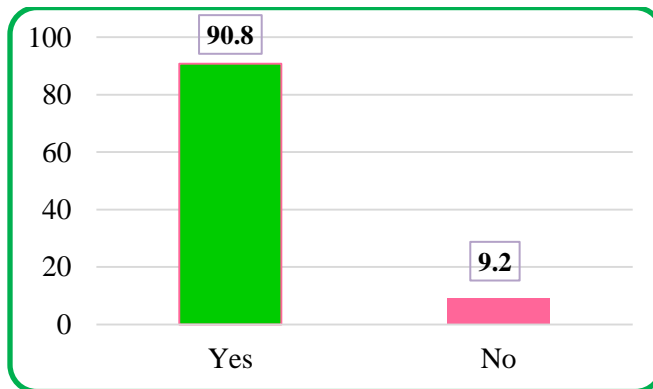
Figure 17: Provision of Postguards (Posts/Pillars) on Bridge Link Roads

6.23 Protection along Banks/Slopes/Embankments on both Sides of the Bridge (CC block) Details of Work

Analysis of Figure 18, with responses from 800 beneficiaries, indicates that 90.0% of respondents reported the implementation of protection (CC block) on both sides of the bridge. However, 6.9% of respondents stated that the protection (CC block) on both sides of the bridge did not function properly. This finding underscores the importance of ensuring the effectiveness of protective measures on bridges to maintain safety and structural integrity. It highlights the need for rigorous inspection and maintenance protocols to address any issues promptly and ensure the continued functionality of infrastructure assets.
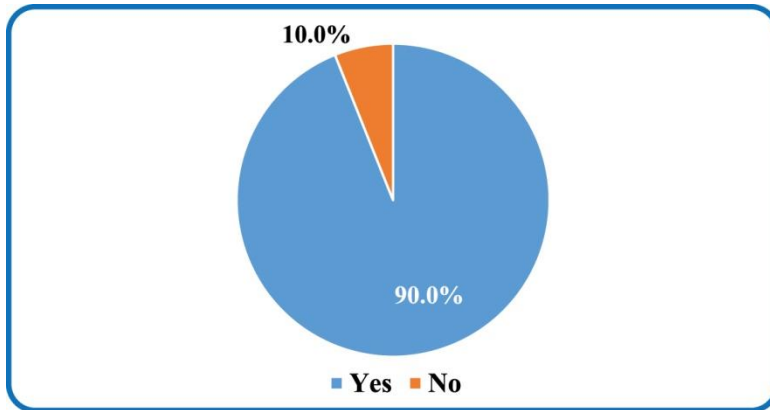
Figure 18: Bank/Slope/Shore Protection (CC Block) Works on Both Sides of Bridge

6.24 Information on your Monthly Average Income Increase as a Result of/after Construction of the Bridge

The analysis of 1,052 beneficiaries shows that 96.2% experienced an increase in their average monthly income after the bridge's construction, highlighting the positive economic impact of improved connectivity. However, 3.8% saw no change in their income, indicating the need to explore factors affecting income disparities among beneficiaries.
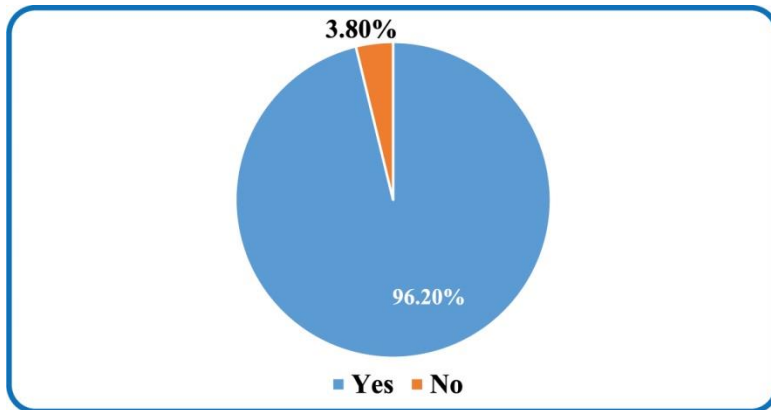
Figure 19: Increase in Monthly Average Income due to Construction of the Bridge

6.25 Information on the Reduction/Reduction in Travel/Communication Cost after the Bridge is/is Constructed

Analysis of table.5, based on responses from 1160 beneficiaries, shows that all respondents believe bridge construction will reduce travel and communication costs at the Upazila/Union level. This unanimous view highlights the expected economic benefits of the new infrastructure in lowering transportation expenses. However, a small minority (1.7%) reported no decrease in costs, indicating a need to explore the reasons behind this discrepancy.

Table 5: Information on Communication costs Reduced/will Reduce after the Bridge is Built/Constructed

		Frequency	**Percent**
Valid	Yes	1140	98.3
	No	20	1.7
Total		1160	100.0

6.26 Information on Cost Reduction in Freight Transport due to Bridge Construction

The analysis of 920 beneficiaries shows that 97.8% observed a reduction in transportation costs after the bridge was constructed, highlighting the economic benefits of improved infrastructure. However, 2.2% reported no change in their average monthly income, suggesting that some factors might limit the direct economic benefits of the bridge for certain individuals or communities.

Table 6: Information on Cost Reduction in Freight Transport since the Bridge was Constructed

		Frequency	**Percent**	**Valid Percent**
Valid	Yes	900	77.6	97.8
	No	20	1.7	2.2
	Total	920	79.3	100.0
Missing	System	240	20.7	
Total		1160	100.0	

6.27 Information on how the Business is/will be Improved after the Construction of the Bridge

The analysis of 960 beneficiaries reveals that 64.2% reported lower transport costs after the bridge construction, indicating the infrastructure's positive impact on reducing transportation expenses. However, 35.8% did not experience the expected reduction, suggesting variability in the benefits. Further investigation into these differing perceptions could help improve future infrastructure projects.

Table 7: Information on how Business is/will Improve during/after Construction of the Bridge

		Frequency	**Percent**	**Valid Percent**
Valid	Transport costs are reduced as a result of the increase in the transport system	616	53.1	64.2
	Farmers are/will be interested in food crop production due to lower cost of transportation	344	29.7	35.8
	Total	960	82.8	100.0
Missing	System	200	17.2	
Total		1160	100.0	

6.28 Information on Current Status of Constructed Bridges

The analysis of 1,136 beneficiaries shows that 39.4% believe the bridge is ready for use, reflecting satisfaction with its completion. However, 60.6% think the bridge is still under construction, indicating ongoing issues or incomplete work. This disparity highlights the need for clear communication and transparency in infrastructure projects to manage expectations and address any remaining concerns or delays.

Table 8: Information on Current Status of Constructed Bridges

		Frequency	**Percent**	**Valid Percent**
Valid	Construction is still going on	688	59.3	60.6
	Suitable for use	448	38.6	39.4
	Total	1136	97.9	100.0
Missing	System	24	2.1	
Total			100.0	

6.29 Information Regarding Interruption of Ongoing Operations of the Bridge by any Local Party

The analysis of 1,160 beneficiaries shows that 98.3% report no obstruction of the bridge's operation by local parties, indicating smooth functioning. Only 1.7% experienced interference, suggesting minimal disruption. This high level of agreement underscores the bridge's effective role in enhancing transportation and connectivity.
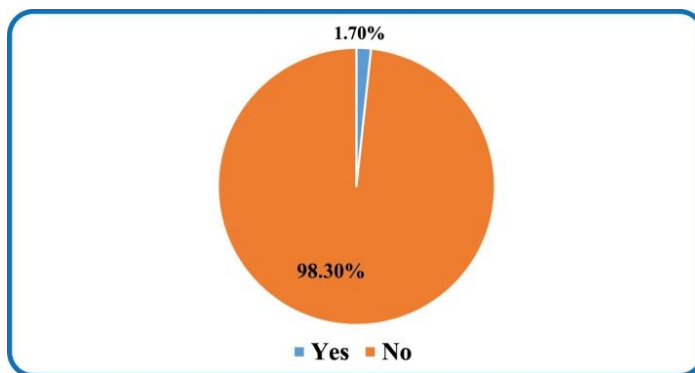

Figure 20: Interruption of Bridge Operations by Local Parties

6.30 Information on Obstruction of Water Flow due to Construction of Bridges

The analysis of 1,160 beneficiaries indicates that 99.7% believe the bridge construction has not obstructed water flow, suggesting effective planning and minimal environmental impact. Only 0.3% expressed concerns about potential water flow obstruction, highlighting the project's successful management of environmental considerations.
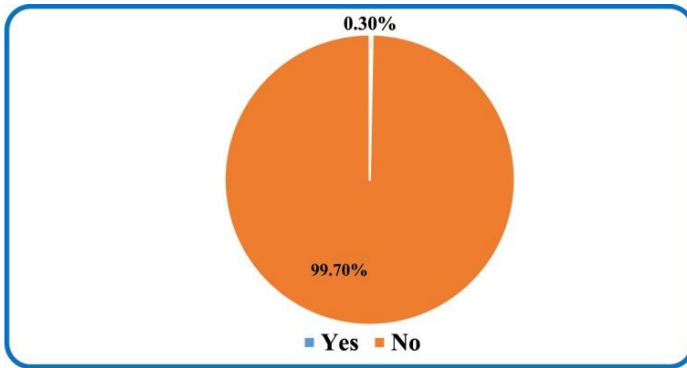
Figure 21: Blockage of Water Flow due to Construction of Bridges

6.31 Information on Obstruction of Water Flow and Navigation during Bridge Construction

Analysis of 1,136 beneficiaries shows that 97.9% believe the bridge construction has not disrupted water flow or navigation, indicating effective project planning. Only 2.1% expressed concerns about potential obstructions, highlighting the need for continued attention to environmental and navigational impacts in infrastructure development.
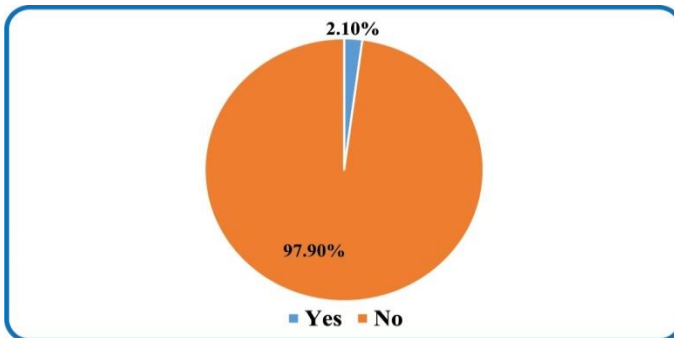
Figure 22: Disruption of Water Flow and Navigation during Construction of the Bridge

7. Observation

The analysis reveals several significant observations regarding the impact of bridge construction on the local community. Firstly, a diverse range of occupations exists among respondents, including car drivers, traders, agricultural workers, and students. Despite this diversity, the majority of respondents report an average monthly income within the range of BDT. 5000-20000, with a significant proportion experiencing an increase in income post-construction. Additionally, there is widespread agreement among respondents regarding the positive effects of bridge construction, with high percentages affirming the correctness of site selection, absence of obstruction to water flow, and improvements in traffic movement, trade, and law-and-order situations. Furthermore, the construction of the bridge has notably reduced travel time and communication costs for residents, with a shift from boat travel to quicker and more convenient road access. This transformation has not only enhanced accessibility but also activated the rural economy and facilitated easier transportation for students and the general public. Overall, the construction of the bridge has led to tangible improvements in socio-economic conditions, employment opportunities, and infrastructure development within the project area, signifying a significant positive impact on the quality of life and livelihoods of local residents.

8. Key Findings

In view of 'Building Bridges, Building Futures,' a comprehensive analysis has been conducted to explore the pivotal role of rural bridges in shaping Bangladesh's growth trajectory. Through quantitative analysis and meticulous examination of key indicators, significant insights have emerged, shedding light on the transformative impact of bridge infrastructure on various aspects of socio-economic development. The following key findings encapsulate the essence of this analysis, offering valuable insights into the profound influence of rural bridges on Bangladesh's growth story.

(a) Occupational Diversity: The analysis reveals a diverse range of occupations among respondents, including car drivers, traders, agricultural workers, students, and daily laborers, highlighting the varied socio-economic landscape within the project area.

(b) Income Enhancement: Despite diverse occupations, the majority of respondents report an average monthly income within the range of BDT. 5000-20000. Moreover, a significant proportion of beneficiaries, approximately 96.2%, report an increase in their monthly income post-bridge construction, indicating a positive impact on economic well-being.

(c) Site Selection and Infrastructure Quality: A high level of satisfaction, with 98.2% agreement, is observed regarding the correctness of site selection for bridge construction. Additionally, 98.3% of respondents affirm that the bridge's construction does not obstruct water flow, underscoring the importance of proper infrastructure planning and execution.

(d) Improved Accessibility and Travel: The construction of bridges has significantly reduced travel time and communication costs for residents, leading to enhanced connectivity within the project area. With 98.0% of respondents noting increased traffic movement post-construction, it reflects the effectiveness of bridges in facilitating easier transportation.

(e) Economic Activation and Trade Boost: The bridge construction has led to a notable increase in trade activities, with 98.3% of respondents acknowledging a positive impact on trade. This suggests that improved infrastructure contributes to economic activation and growth, fostering local business development.

(f) Enhanced Law and Order: A significant majority of respondents, accounting for 98.2%, believe that bridge construction has contributed to improving the law-and-order situation in the project area, indicating a positive correlation between infrastructure development and community safety.

(g) Education Access: Nearly all respondents (98.3%) agree that bridge construction has facilitated easier access to education for boys and girls, reflecting the broader societal benefits of improved infrastructure in promoting education and human development.

(h) Positive Socio-Economic Impact: Overall, the construction of bridges has had a transformative effect on the socio-economic landscape of the project area. It has led to reduced unemployment, increased employment opportunities, activated the rural economy, and improved the overall quality of life for residents.

These key findings collectively underscore the pivotal role of rural bridges in driving socio-economic development and fostering inclusive growth within Bangladesh's rural communities.

9. Recommendations and Conclusion

Rural bridges are crucial for socio-economic development and connectivity in Bangladesh, providing essential access to services, markets, and employment for rural communities (Emran & Shilpi, 2023; Khandker & Koolwal, 2010). To enhance their impact, recommendations emphasize the need for targeted interventions, community involvement, and integrated infrastructure approaches (Beutel, Tangen, & Carrington, 2019; Fontanez, 2020). By implementing these strategies, stakeholders can maximize the benefits of rural bridges, fostering inclusive and sustainable development and empowering communities to thrive in Bangladesh's evolving landscape (Asadullah, Savoia, & Mahmud, 2014; Mujeri & Mujeri, 2020).

(a) Investment in Rural Bridge Infrastructure: Given the significant positive impact of rural bridges on various socio-economic indicators (Emran & Shilpi, 2023), there is a pressing need for continued investment in bridge infrastructure development. Government agencies and development partners should prioritize funding for the construction and maintenance of rural bridges, ensuring equitable access to essential services and opportunities for all communities (Khandker & Koolwal, 2010).

(b) Enhanced Monitoring and Maintenance: To maximize the long-term benefits of rural bridges, there is a need for robust monitoring mechanisms and regular maintenance protocols (Fontanez, 2020). Implementing agencies should establish effective monitoring systems to track the condition of bridges and address maintenance issues promptly, thereby ensuring their longevity and functionality (Schroeder, 2019).

(c) Community Engagement and Participation: In the planning, design, and implementation phases of rural bridge projects, community engagement and participation should be prioritized (Beutel, Tangen, & Carrington, 2019). Local stakeholders should be actively involved in decision-making processes, allowing for the identification of specific needs and preferences, as well as fostering a sense of ownership and accountability (Ripon & Al-Mamun, 2020).

(d) Integration with Rural Development Strategies: Rural bridge development initiatives should be integrated into broader rural development strategies, aligning with national development goals and priorities (Rahman, 2021). By linking bridge construction efforts with initiatives aimed at promoting agricultural productivity, enhancing market access, and improving livelihood opportunities, synergies can be created to foster holistic rural development (Sen, Mujeri, & Shahabuddin, 2007).

(e) Capacity Building and Skills Development: To ensure the sustainable management and upkeep of rural bridges, capacity-building initiatives should be implemented to enhance the technical skills and knowledge of local communities (Islam et al., 2023). Training programs on bridge maintenance, repair techniques, and disaster preparedness can empower community members to take proactive measures in safeguarding bridge infrastructure (Rahman & Savar, 2020).

(f) Adoption of Green and Sustainable Practices: In line with environmental conservation efforts, bridge construction projects should adopt green and sustainable practices (Ripon & Al-Mamun, 2020). Measures such as using eco-friendly materials, implementing erosion control measures, and preserving natural habitats can mitigate the environmental impact of bridge construction activities while promoting ecological resilience (Schroeder, 2019).

(g) Promotion of Inclusive Growth: Lastly, efforts to promote inclusive growth should be central to rural bridge development strategies (Mujeri & Mujeri, 2020). Special attention should be given to marginalized and vulnerable groups, including women, youth, and persons with disabilities, to ensure their equitable participation and access to the benefits of bridge infrastructure development (Beutel, Tangen, & Carrington, 2019). By fostering inclusive growth, rural bridges can become catalysts for reducing socio-economic disparities and promoting shared prosperity across communities (Emran & Shilpi, 2023).

In conclusion, the findings and recommendations presented underscore the transformative role of rural bridges in shaping Bangladesh's growth narrative. As vital arteries of connectivity and progress, these bridges serve as conduits for socio-economic development, fostering resilience and opportunity within rural communities. Through targeted interventions focused at enhancing accessibility, promoting sustainable livelihoods, and bolstering infrastructure resilience, stakeholders can unlock the full potential of rural bridges as drivers of inclusive growth and prosperity. By heeding the recommendations outlined herein and fostering a collaborative approach to bridge development, Bangladesh can chart a course towards a future where every bridge built signifies not just a physical structure, but a pathway to a brighter, more equitable tomorrow for all its citizens.

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Online Learning System in Bangladesh: Perceptual Views of the University Students

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Abstract

This study aims to explore students' perceptions of the online education system in newly emerging private universities in Bangladesh. It focuses on and justifies perceptions with respect to gender, academic discipline, and devices used for online classes utilizing correlation analysis, one-way ANOVA, and chi-square test. From a perceptual overview of a sample of 315 students, 49.8% of respondents prefer the face-to-face format. More specifically, students' perceptions varied by academic discipline and devices used for online learning, but not by gender according to the result. Thus, it has been inferred that the world of education has already been challenged with blended learning as a new paradigm of change that is supposed to be the ultimate solution for the future disruptions of university education systems. The study has duly found out advantages of online learning, such as effective motivation for learning, conducive teaching environment, diversity in teaching style, the flexibility of time and content availability, better academic performance, and disadvantages such as network problems, lack of interaction in practical courses, less acceptability, lack of technical support and lack of understanding lectures smoothly etc.

Keywords: *Online Learning System, Perceptual Views, University Students, Teaching Method*

1. Introduction

The COVID-19 pandemic has disrupted every aspect of life, and even led to widespread school and college closures across the globe (Tadesse and Muluye, 2020). Most of the countries minimize the effect of spreading the pandemic by taking some steps like restricting mass gatherings, limiting public events, restricting cross-border transfer on local and international transport, testing and

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contact identifying, as well as stopping jobs and closing educational institutions (Aristovnik et al., 2020). Due to the advancement of technology, online education systems have been experienced all over the world, but not so popular and in practice in Bangladesh before this pandemic (Khan, Rahman, and Islam, 2021).

However, the forcing closure of all educational institutions around the world addressed this online learning system as a new dimension to the education system for active participation of both teachers and students (Dhawan, 2020). Henceforth, transitions are difficult, and rapid adaptation to education in developing country contexts may not be necessary or even unexpected (Zoltan and Ewelina, 2021). even when students have difficulty understanding compared to attending physical classes (Kulal and Nayak, 2020). University closures have affected student performance at various educational levels, particularly as the effectiveness and extent of digital accessibility determines how well students learn (Muthuprasad et al., 2021). More specifically, internet access and appropriate devices as technological components of online learning affect both student performance and progress, Likewise, Bali and Liu (2018) found that physical learning is more interacting than virtual learning in terms of face-to-face interaction, cordial communication and amusement. Again, traditional classes help meet students' needs and improve their performance while the quality of online learning depends to the extent of digital availability and functionality.

Due to the covid-19 pandemic, the education system has been shifted from offline to online without extensive research on the impact, advantages and disadvantages of online education. At that time, it was the only means of communication between academics and students. However, in the developing country context with little familiarity for a few teachers, students, institutional infrastructure and other stakeholders, the rest are yet to adopt these changes. Private universities in Bangladesh are playing a major role in offering tertiary level education and producing more graduates along with public universities. There are a very few studies regarding the perceptions of private university students in the world including Bangladesh. And there is no study regarding the perceptions of students in Bangladesh towards online learning system. This research focused on regional private universities in Bangladesh such as Feni University, Royal University, Brahmanbaria University, First Capital University of Bangladesh, Varendra University, and Leading University where most of the students were not accustomed to the online education system before the pandemic. But adapting to this change during the pandemic has been a challenge for both teachers and students (The Daily Star, 2024). From three recent studies of universities around the world in terms of teachers' and students' perceptions of

online learning, such as India, Indonesia, and Sri Lanka (Howshigan and Nadesan, 2021; Muthuprasad, T. et al., 2021; Harefa, S. and Sihombing, G.L.A., 2022; Abdi, A.W. et al. 2021), the differences from these studies are quite subtle.

Online learning frameworks have become increasingly popular as a dynamic platform for learning and teaching methods for both teachers and students in the United Arab Emirates (UAE) (Sallum and Shallan, 2018). Although, developed countries have introduced online systems in some academic activities such as interviewing foreign admission candidates, online admission processing, online payment systems, online counselling and some online course offerings for international students, this system is completely new for developing and least developed countries like Bangladesh. As a new system of education in Bangladesh, students are faced with various problems, such as infrastructure, internet speed, load-shedding, devices, operating efficiency of devices and financial conditions, etc. Despite these limitations, the education system in Bangladesh worked in full swing during the pandemic which is considered interesting in the sense of the authors to gain insight into why and how students have adapted and whether gender, academic discipline or devices used may have something to do with it.

2. Literature Review and Hypothesis

2.1 Online Learning System and Perception

Online learning is becoming an increasingly popular and positive concept as it offers a wide variety of programs and is more affordable, flexible and convenient (Basilaia and Kvavadze, 2020). But in case of developing country, online courses will not be beneficial in the long run because higher education is primarily focused on practical, lab and field service and is very technical, professional and specialized (Mollah and Parvin, 2020). Nevertheless, online learning reduced the scope of classroom activities resulting in less engagement and preparation (Al-Amin et al., 2021). Similarly, the primary barriers to online education in underdeveloped countries are attention span, comprehension of lessons through online platforms, and unlikely compatibility of internet and electricity (Oluyinka and Endozo, 2019). The situation is further exacerbated by technological limitations, online drop out; inadequate data packs accessing material for classes, low connectivity, shortage of devices, inconvenient learning atmosphere, inability to use technology, poor feedback and teacher's incapacity to handle material and interaction (Rahman et al., 2023). By and large, student's perception is significantly influenced by e-learner skills, external influences, system interactivity and social influence (Sharma, Sankapal and Gulati, 2020). Students' attitudes toward e-learning were not influenced by a student's discipline (Suri et

al., 2016). However, there is variation in online learning that results in ratings of unexpected outcomes for evaluating learning platforms by males and females (Islam and Mahmud, 2022; Shahzad et al., 2021). Yet, students still have strong ICT skills and positive attitudes towards online learning (Johnson et al., 2021). Kulal and Nayak (2020) studied on the perception of teachers and students toward online learning, students believe that online teaching are not comfortable than offline learning and find it difficult to grasp the online learning method. In contrast, Maphosa (2021) conducted a study and revealed that students' behavioral motive was assertive by the standard performance, higher effort and promoting environment. As a result, students had a favorable impression of online learning. But the lack of technology and the high cost of data have resulted in a major learning loss.

2.2 Disruption and Blended Learning

The perceptions of students' execution on the time of Corona pandemic and showed that, overall, students have favourable attitudes toward online learning (Anwar and Wahid, 2021). According to Paechter and Maier (2010), students prefer blended learning, where a mix of online and physical classes is conducted depending on course requirements. During the time of COVID-19, (Abbasi et al.,2020) assessed the attitudes of 382 students and found that 77% of students had a negative attitude towards online learning, which means that students prefer traditional physical learning to online learning. For instance, over 60% of students concurred that watching recording videos lessons and practical classes and replying brief questions was helpful (Azlan et al., 2020). Thus, the study found that students still feel face to face lecture classes as less monotonous, more interacting and they can ask questions directly to the instructors (Ahmad, 2020). Another study was conducted to examine how students perceive online learning on the time of Corona pandemic in Bangladesh and discovered that despite a number of difficulties when utilizing online platforms, students have a favorable attitude toward online learning. (Rahman and Islam, 2023), even to inadequate infrastructure (Priyadarshana et al., 2021) whereas Nishimwe et al. (2022) studied that there was no discernible difference between learning the material in-person and online in terms of comprehension. Furthermore, they stated that whether they were taking classes in person or online, they put about the same amount of time and effort into their studies.

2.3 Online Learning Movements, Advantages and Challenges

Dutta and Smita (2020) conducted a study to find out how Bangladeshi educators and students felt about virtual instruction during the COVID-19 pandemic and found a lack of gadgets, inadequate internet access, expensive internet, sluggish

internet connections, and trouble accessing websites. Bączek et al. (2021) examined the attitudes of Polish students toward online learning during the COVID-19 epidemic and discovered that although there were a number of difficulties when converting to online learning, most students were eager to continue their education online and felt good about it even after the outbreak., such as low enthusiasm, ineffective time utilization, and limited use of resources. The students listed a number of benefits of online learning, such as increased accessibility, convenience, and flexibility. Harefa and Sihombing's (2022) studied on the students' perceptions regarding the effectiveness of online learning during the COVID-19 pandemic; students in the remote Indonesian province of North Tapanuli believe that online learning is less effective due to not having sufficient support from infrastructure and communication networks. Martin (2020) found that most Australian students recognized the advantages of distance education. Since online learning allowed them to better manage their time and study at their own speed, students liked the freedom it afforded. Students faced difficulties when taking virtual classes and found it difficult to understand the material. Female students demonstrated a higher perception of online learning than male students did (Sarker et al., 2021). While teachers continue to educate in traditional offline classrooms in Bangladesh, students and teachers are using internet technology for the first time to carry out educational tasks (Ramij and Sultana, 2020). Majority of students responded that virtual learning would not the same offline learning (Unger and Meiran, 2020). Gelles et al. (2020); Henriksen, Creely and Henderson (2020) discussed the difficulties instructors experience while transitioning from a traditional classroom to an online one. Nigerian students mentioned in a study, the high cost of ICT devices has a negative effect on e-learning adoption in terms of social presence, social engagement, and satisfaction (Oyediran et al., 2020). Lischer, Safi and Dickson (2021) found that the majority of students choose to return to traditional classroom settings. However, in some circumstances, this preference is higher among students who have just had e-learning experiences, but it is much lower among students who have had both e-learning and face-to-face learning sessions (Gherheș et al., 2021). Singh et al. (2021) found that online education is ineffective because students find it difficult to transition to the online style of education, and offline education remains the most desired medium of education.

2.4 Hypothesis

The hypotheses of the study are as follows:

1. H1: Students' perceptions of online learning vary with respect to gender.
2. H2: Students' perceptions of online learning vary with respect to academic discipline.

3. H3: Students' perceptions of online learning vary with respect to devices used.

3. Research Objectives

The general objective of this research is to find out the students' perception of online classes in the universities of Bangladesh. The specific objectives of this study are:

1. To assess whether the perception of students varies according to gender, academic discipline, and devices used for online classes.
2. To develop a framework based on the benefits and challenges of the online learning system suggested by the respondents.

4. Conceptual Framework

Constructivism is a contemporary theory of learning that was initially introduced by Piaget and subsequently refined by Vygotsky. Constructivism, which primarily draws from the theories of Piaget and Vygotsky, is one of the contemporary theories of learning. This theory focuses on helping the learner form new knowledge by using the current and previous experiences to help them link the gap between what they know and what they need to know. By relying on their current knowledge, learners can select and transform existing ideas to shape new concepts of learning. A "dramatic lessening of reliance on a didactic, textbook-based, transmission of knowledge approach to teaching and learning in the classroom" is supported by this theory of learning, which is based on the notion that pupils actively produce knowledge (Prawat, 2008). According to constructivists, learning occurs when new information is "built into and added onto an individual's current structure of knowledge, understanding, and skills" (Pritchard, 2009). This is because they see learning as the outcome of mental construction. According to this notion, learning occurs most effectively when youngsters actively create their own understanding (Gigbels and Loyens, 2009; Loyens et al., 2009). Constructivism is marked by four features; knowledge building, cooperative learning, metacognition, and real learning task. First, students complete meaningful learning tasks by finding solutions to issues that are applicable to their everyday lives. Second, cooperative learning influences how learners develop new information through teamwork and engagement with others. Thirdly, metacognition is the process by which students become accountable for their own learning and gain new knowledge through self-regulating activities like goal-setting, self-regulation, and self-assessment. Lastly, knowledge construction: the student creates knowledge by learning.

Constructivism has two philosophies: social constructivism and cognitive or individual constructivism (Olsen, 2000; Powell et al., 2009). It implies that knowledge is created through both individual and collective labor. Based on Piaget's theory of cognitive development, individual constructivism primarily focuses on how an individual constructs knowledge on their own by using their own cognitive processes and working alone. In the context of education, this is regarded as an individual work approach. Conversely, Vygotsky's theory of social interaction between an individual and society, which emphasizes language and culture as the fundamental components of interaction, forms the basis of social constructivism. In the context of education, this is regarded as a group-working technique. This theory is supposed to articulate the variations in perceptions of online learning in terms of gender, academic discipline and device used considered as follows:
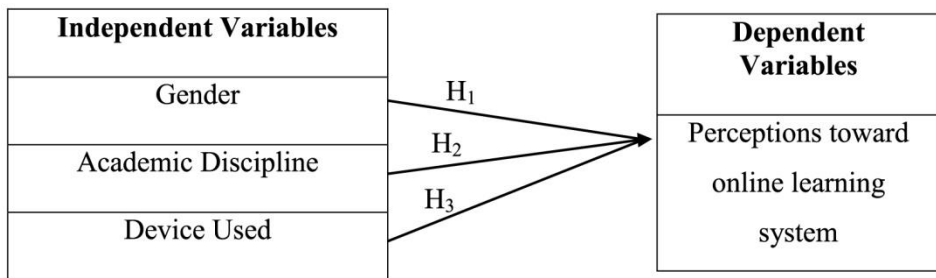
Figure 1: Students' Perception of Online Learning System

5. Research Methodology

Having both qualitative and quantitative data, the present study is mixed method research in nature.

5.1 Research Methods

The research was carried out using observation, interview and questionnaire survey. Observation and interview were employed as qualitative research methods.

5.1.1 Survey

The survey was conducted using questionnaire techniques. To assess students' perceptions, a questionnaire was prepared through extensive review of existing literature and outcome of the pre-study. We used Google Forms to solicit respondents' feedback through two-way questions for the period January 2024 –

June 2024. The structured questionnaire was used as self-administered questionnaire to collect data from respondents.

5.1.2 Observation

As the researchers of the study are directly involved in the teaching profession, it has become easier for them to observe and interact with students during online and offline classes and to evaluate student results through online and offline modes. As a pre-study, the researchers observed 60 students from various disciplines of Feni University who had experience in both online and offline learning systems from the faculties. Observation on the same students was conducted before pandemic on offline classes and during pandemic on online classes. Their responses were taken as content for designing questionnaire.

5.1.3 Interview

Interview method was applied as a qualitative technique in our pre-study. We interviewed a total of 15 students from three faculties of Feni University through face-to-face conversation to find out about the perceptions toward online learning system.

5.2 Population, Sample and Sampling Procedure

There are 112 private universities in Bangladesh (UGC, 2024). Among these universities, the study was conducted on six emerging private universities namely Feni University, Royal University of Dhaka, Brahmanbaria University, First Capital University of Bangladesh, Varendra University and Leading University. The students of three backgrounds namely Faculty of Business Administration, Faculty of Arts, Social Science and Law, Faculty of Science & Engineering were population for our study. All undergraduate level students who have experienced learning in both online and offline mode were taken as sample. Sample students were purposively selected from population. An online questionnaire was sent to the teachers of the respective sample universities to circulate among the targeted students within which responses of 315 students were found.

5.3 Analytical Tools

Both descriptive statistics (frequency, percentage, mean and standard deviation) and inferential statistics (correlation analysis, one-way analysis of variance test, chi-square test) were used for data analysis. Kaiser-Meyer-Olkin (KMO) and Bartlett's tests were used to measure sampling adequacy. IBM SPSS 25 was used as data analysis tool in this study.

6. Results of the Study

Table 1: Sample Adequacy Test Result

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.776
Bartlett's Test of Sphericity	Approx. Chi-Square	981.139
	Df	231
	Sig.	0.000

Table-1 showed the KMO value of the sample is 0.776 which is more than significance level 0.5 which shows that sample is adequate for factor analysis. However, the KMO value closer to 1.0 is considered ideal. The value of Bartlet's test of Sphericity is also at a level of significance.

6.1 Analysis of Respondents' Responses

Table 2: Demographic Analysis of Respondents

Students		
Variables	**Frequency (Total)**	**Percentage (%)**
Gender Male	152	48.3%
Female	163	51.7%
Academic Discipline Science	63	20%
Arts	87	27.6%
Business	165	52.4%
Device used Mobile	181	57.5%
Laptop	16	5.1%
Both	118	37.5%
Internet Connectivity Mobile data	39	12.4%
Wi-Fi	54	17.1%
Both	222	70.5%
Suggested teaching method Online	63	20.0%
Offline	157	49.8%
Blended	95	30.2%

From Table 2, it was apparent that out of 315 students, 48.3% male and 51.7% female. 52.4% from Business, 27.6% from Arts and 20% from science discipline. 57.5% of students used mobile during online classes, 37.5% students used both mobile and laptop who are and 5.1% students used laptop. To conduct the online classes, 17.1%, students used Wi-Fi, 12.4% students used mobile, and 70.5% students used both mobile and Wi-Fi. It also found that 49.8% students suggested offline teaching method, 20% students suggested online teaching and 30.2% suggested blended teaching method.

6.2 Perception Analysis of Students

Table 1A (Appendix), showed that 79.7% of students faced internet network problems, 53% students faced technical problems. The home environment was suitable said 81.9% of students. It's very interesting that 57.5% students enjoyed online classes, 64.8% student's response that online classes weren't interactive and 74.9% got motivation from teachers during online classes. 66.7% students gave more concentration during online classes. The academic result of 229 students, who are 72.7% was excellent. 224 students who 71.1% got adequate course materials. Of 203 students, 64.8% were not satisfied with the evaluation system. 73% said practical courses were not understandable though online. Understanding capability was not more of 217 students who are 68.9%. 245 students, 77.8% got courses outline. Online classes were convenient to 71.1%. 67.3% opined online learning system not better than offline. 68.3% found mathematical courses difficult, 59.4% didn't get any technical support from university, 62.2 % opined that response rate was more in online classes than offline classes

Table 3: Correlation Analysis (Students)

Correlation between Average Perception Score & Gender	Gender	Perception average
Pearson Correlation	1	0.026
Sig. (2-tailed)		0.647
N	315	315
Correlation between Average Perception Score &Academic Discipline	Perception average	Academic Discipline
Pearson Correlation	1	0.223*
Sig. (2-tailed)		0.003
N	315	315
Correlation between Mean Perception Score and the type of Student's Device to access online classes	Perception average	Device used for online

		classes
Pearson Correlation	1	0.283*
Sig. (2-tailed)		0.000
N	315	315

*Correlation is significant at the 0.05 level (2-tailed)

From the above Table-3, the study found no significant difference between perception of students towards online learning system and gender (0.647>0.05) but significant correlation was found between perception of students towards online learning system & the type of student's device to access online classes (0.00<0.05) and between perception of students towards online learning system & academic discipline (0.003<0.05). These results were also supported at one-way ANOVA analysis.

Table 4: One Way ANOVA Analysis

Perception Average by Gender (ANOVA)					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	0.006	1	0.006	0.210	0.647
Within Groups	9.050	313	0.029		
Total	9.056	314			
Perception Average by Academic Discipline (ANOVA)					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	0.002	1	0.355	15.686	0.003
Within Groups	9.054	313	0.029		
Total	9.056	314			
Perception Average by type of device used (ANOVA)					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	0.911	2	0.455	17.439	0.000
Within Groups	8.145	312	0.026		
Total	9.056	314			

Table-4 showed no significant difference (F 0.210, p-value 0.647) between average perception score and gender but significant difference between average perception score & academic discipline (F 15.686, p-value 0.003) and between perception of students towards online learning system and pattern of students' material accessing virtual classes (F 17.439, p-value 0.000)

7. Discussion

A new dimension of teaching and learning through online mode was explored in the field of education during the COVID pandemic for developing countries like Bangladesh. Using participant observation and interview techniques, the researchers also found out the challenges from the perspective of students that they faced mobile and internet network problems (Dutta and Smita, 2020; Harefa and Sihmbing, 2022), Lack of technical support, communication barriers, difficult to understand the mathematics course (Adnan and Anwar, 2020; Molla and Parveen, 2020; Al-Amin et al., 2021; Dhawan, 2020). From the students' point of view, online classes have advantages such as effective motivation, favourable home environment, diversity in teaching styles, time flexibility and content availability and improved academic performance. These were supported by (Basilaia and Kvavadze, 2020; Unger and Meiran, 2020; Rajabalee and Santally, 2020). The researchers aimed to explore perceptions whether these perceptions of respondents varied by gender, academic discipline, and devices used for online learning. Studies have shown that students prefer the face-to-face format (Lischer et al., 2021; Singh, et al., 2021; Azlan et al., 2020; Abbasi et al., 2020; Priyadarshana et al., 2021; Rahman et al., 2023) and students' perceptions vary according to academic discipline (Suri et al., 2016; Shahzad et al., 2021; Sarker et al., 2021) and device used for online learning but not according to gender (Sarker et al., 2021).

7.1 Benefits and Challenges of Online Learning System from Students' Perspective

Based on the findings of this research, the following advantages and disadvantages according to student's viewpoint have been pointed out. Most responses to the sample questions for data collection have taken as benefits and challenges of online learning system.

From the students' view points, 74.9% agreed that online teaching is the best for effective motivation for learning, home environment was conducive according to 81.9%, 80% found lots of diversity in teaching method, there were flexibility of time opined by 71.1%, adequate content provided by teachers confirmed by 71.1%, academic performance was better than offline opined by 72.7%, immediate feedback system was more easy according to 62.2%. 32.7% were satisfied with online learning, 66.7% able to give their full concentration and 35.2% were satisfied to the evaluation system during online classes. On the other hand, students faced lots of problems and difficulty during online classes such as network problem, lack of interaction and technical support, toughness to understand mathematical/practical courses, less acceptable and difficult to

understand lectures as79.7%, 64.8%, 59.4%, 68.3%, 67.3% and 68.9% consecutively.The findings of this article can help the readers to understand the actual situation of online education system in Bangladesh and to overcome the before fully implementing the online education system in the future.
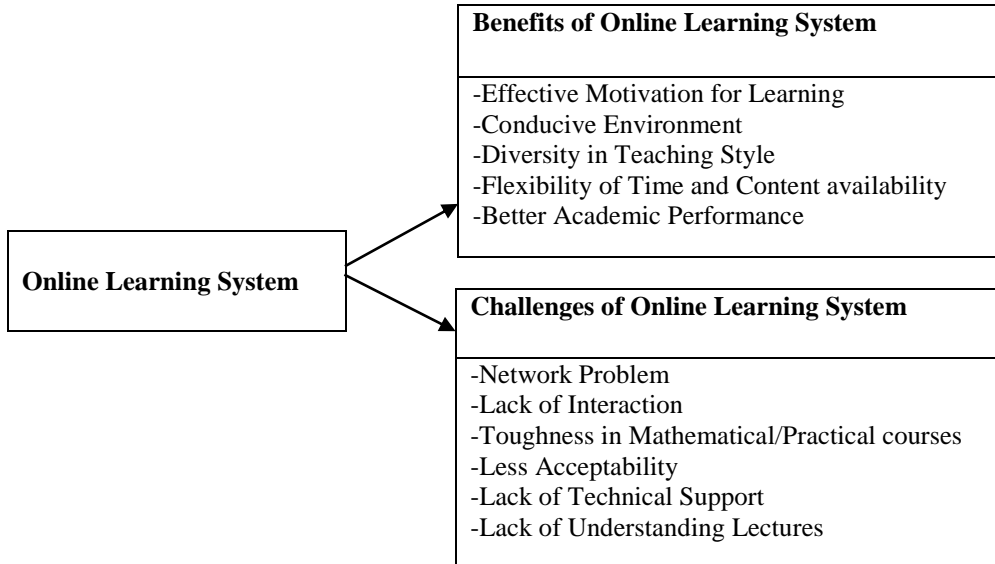
Benefits of Online Learning System

-Effective Motivation for Learning
-Conducive Environment
-Diversity in Teaching Style
-Flexibility of Time and Content availability
-Better Academic Performance

Online Learning System

Challenges of Online Learning System

-Network Problem
-Lack of Interaction
-Toughness in Mathematical/Practical courses
-Less Acceptability
-Lack of Technical Support
-Lack of Understanding Lectures

Figure 2: Benefits and Challenges of Online Learning System (Students' Perspective)

8. Theoretical and Managerial Implications

The theoretical contribution of the research highlights the benefits and challenges of online learning system in Bangladesh based on perpetual views of university students. The generalizability of the findings extends beyond regional private universities to public universities established in different regions of Bangladesh, colleges under National University of Bangladesh, as well as privately owned dental and medical colleges in different regions of Bangladesh.

The findings of this study underscore several managerial implications for educators, students, and researchers in the context of online learning during the COVID-19 pandemic at regional level. This study contributes to the existing literature by shedding light on the factors influencing student performance and satisfaction, particularly by examining the effect of perceptions on academic achievement, a previously neglected aspect. This echoes previous research,

highlighting the importance of investigating variables that influence student satisfaction. Educational institutions especially in remote areas can use these insights to improve the quality of education through blended learning approaches. By adapting to world-class education practices and creating conducive learning environments, universities can better prepare for future challenges, such as pandemics, and ensure continued access to education for all stakeholders.

9. Conclusion

Although, this study highlights significant differences and similarities in the perceptions of students regarding online learning system, it is essential to acknowledge its' limitations. The study sample, limited to regional private universities in Bangladesh, limits the generalizability of its findings.

This study focused on regional private universities in Bangladesh. The result of this study may be helpful for other regional universities in Bangladesh to choose the methods of learning like online or offline. The findings may also be used by the regional public universities in Bangladesh along with other countries for further extensive study on perception based on other variables. To address the highlighted challenges, collaboration between key stakeholders such as UGC, Ministry of Education, university authorities, teachers and students is essential. Future research should include a wider range, including public universities and more diverse private institutions with larger sample sizes. Moreover, comparative analysis between different types of universities in Bangladesh and abroad will provide valuable insights. Moving forward, research efforts should focus on developing strategies to exploit the identified advantages and mitigate the challenges of online learning while ensuring the resilience and effectiveness of the education system. Furthermore, exploring how perceptions vary across different demographic and academic factors and their implications for instructional approaches will significantly contribute to the advancement of knowledge in this area.

10. Recommendations

Though the study found some advantages of online learning like effective motivation for learning, conducive teaching environment, diversity in teaching style, Flexibility of time, content availability and online learning can be the best solution for continuing learning in case of disruptions. But it has lots to disadvantages too such as network problem, less acceptability, lack of technical support and lack of understanding lectures smoothly etc. In near future, distance learning, blending learning methods and different online based test are being popularized due to globalization, upgradation of modern technology and to face

normal disruptions in off-line learning system. So, the Bangladeshi universities should develop their infrastructures for blending learning and train up students to cope up with the system. The combined effort of Government and university authority can overcome the lacking in case of effective online learning system.

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Appendix-A

Table 1A: Survey Question Analysis

Survey questions	Yes		No
	Frequency	Percentage	Frequency
Have you faced any internet network problem during online classes?	251	79.7	64
Have you faced any technical problem during online classes?	167	53	148
Was the environment of your home suitable for conducting online classes?	258	81.9	57
Have you enjoyed the online classes than offline classes?	181	57.5	134
Do you think online classes were more interactive than offline classes?	111	35.2	204
Do you think teacher's teaching style varies according to mode of learning system?	252	80	63
Have you got any motivation from teachers through online during classes?	236	74.9	79
Were you more attentive to online classes than offline?	210	66.7	105
Was your academic result better in online than offline?	229	72.7	86
Have you been provided adequate course materials during online classes?	224	71.1	91
I prefer online evaluation system to offline evaluation system	111	35.2	203
Do you think practical courses were understandable through online?	85	27	230
Your understanding capability was more in online than offline?	98	31.1	217
Have you been given course outline of all courses during online classes?	245	77.8	70
Was the online class schedule convenient to you?	224	71.1	91

Do you think online learning system is better than offline system?	103	32.7	212
Have you found mathematical courses easy in online than offline?	100	31.7	215
Did you get any technical support from your university for online classes?	128	40.6	187
Your response rate was more in online classes than offline classes	196	62.2	119

Social Impositions, Diasporic Trauma, and Reconciliation in Bangladeshi Female Immigrants as Portrayed in Monica Ali's *Brick Lane*

Md. Asif Kamal[1]

Abstract

Monica Ali's Brick Lane depicts the protagonist Nazneen's silent acceptance of what comes to her life and exposes her exasperated angst which insidiously wriggles its way out through her inner trauma in silence. The lack of expression intensifies the impact of the trauma which goes unwitnessed, unspoken and unclaimed. Only her grieving daughter is instrumental in healing the mother's incomprehensible trauma by combining her dissociated self and showing an escape to freedom. This paper aims at exploring the traits of a Bangladeshi poor female immigrant Nazneen's disassociated self, and of the struggle and dilemma leading to subsequent trauma she experiences. A qualitative analysis of the novel is performed to trace and explore the struggles of immigrant characters who are in the quest for and formation of their essential identity breaking through the essentialized role, specifically, imposed on women by the chauvinist Bengali society. The study reveals that the dislocated female immigrant's multifold trauma becomes incomprehensible, subsided under layers of social impositions created by nationality, ethnicity, religion, culture, gender, and economic status.

Keywords: *Diaspora, Trauma, Literature, Immigration, Social Impositions, Reconciliation, Brick Lane, Monica Ali*

1. Introduction

Migration and diaspora studies have extensively examined the challenges faced by individuals who straddle different cultural and social worlds. For female immigrants, these challenges are often exacerbated by overlapping factors such as gender, ethnicity, and socio-economic status. Literature offers a valuable perspective on these issues, providing narratives that shed light on both personal and collective immigrant experiences. Monica Ali's novel *Brick Lane* (2003) makes a notable contribution to this field, presenting a detailed portrayal of a Bangladeshi woman's life in London. *Brick Lane* chronicles the life of Nazneen,

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a Bangladeshi immigrant who relocates to London with her husband through an arranged marriage. The novel delves into Nazneen's experiences with cultural displacement, societal pressures, and her gradual path toward self-discovery and reconciliation. These themes are crucial for understanding the broader context of diasporic trauma (Lahiri, 2019) and the ways individuals navigate reconciling their past with their present.

1.1 Problem Statement

Despite the rich narrative provided by Brick Lane, there is limited scholarly analysis on how social impositions, diasporic trauma, and reconciliation intersect in the experiences of Bangladeshi female immigrants as portrayed in the novel. Existing research on immigration literature often addresses these themes in general terms, lacking a detailed examination of the specific dynamics of gender and cultural conflict faced by women in the diaspora. This gap highlights the need for a focused analysis of Monica Ali's representation of these issues. The research aims to address this gap by conducting an in-depth study of the novel to better understand these interconnected themes.

1.2 Research Questions

The study addressed three major research questions as listed below:

1. How does *Brick Lane* portray the social impositions experienced by Bangladeshi female immigrants, and how do these impositions intersect with gender and cultural expectations?

2. In what ways does the novel depict the trauma associated with the diasporic experience, and how is this trauma manifested in the life of the protagonist, Nazneen?

3. How does *Brick Lane* address the process of reconciliation for immigrant women, and what narrative strategies does the novel employ to represent the protagonist's journey towards self-empowerment and identity resolution?

2.   Literature Review

2.1 Social Impositions and Gender Dynamics

The body of literature on gender and diaspora, including studies by scholars such as Nira Yuval-Davis (1997) and Homi K. Bhabha (1994), offers a theoretical framework for interpreting how *Brick Lane* portrays the challenges **faced** by immigrant women as they balance cultural traditions with adapting to new social environments. Bhabha's writing explores identity, hybridity, and the

psychological impact of colonialism and migration. The complexities of cultural identity in migration contexts are well addressed through his concept of "the third space". With this connection the article argues that Ali's portrayal of Nazneen's experiences illustrates how gender roles and identity crisis can limit personal agency and sustain trauma, yet it also emphasizes instances of resistance, reconciliation and empowerment as an immigrant.

2.2 Diasporic Trauma

The research article places significant emphasis on the concept of diasporic trauma. It analyzes *Brick Lane* for its representation of the psychological and emotional impacts of migration, especially on women who contend with both cultural dislocation and gender-based oppression. Lahiri (2019) discusses themes relevant to diasporic identity and trauma, including the impact of patriarchal structures on the experiences of characters in *Brick Lane*. The article utilizes trauma theories from scholars such as Cathy Caruth (1995) and Marianne Hirsch (2008), who have examined the transmission of traumatic experiences across generations and cultures.

The article argues that Nazneen's internal and external struggles serve as a representation of the wider diasporic trauma faced by many immigrants. The novel's portrayal of Nazneen's challenges with isolation, cultural displacement, and family expectations reflects insights from trauma studies (Brewin, 2001; Caruth, 1996; Felman & Laub, 1992; Herman, 1992; Leys, 2000; van der Kolk, 2014) which indicate that diasporic individuals often endure a deep sense of loss and alienation. Additionally, the article explores how the novel demonstrates coping and healing processes, underscoring the role of narrative in reconciling fragmented identities.

2.3 Reconciliation

A major contribution of the research article is its analysis of reconciliation as depicted in *Brick Lane*. The study explores how Nazneen's path toward self-discovery and empowerment signifies both personal and collective reconciliation (Lederach, 1997). This aspect of the novel is examined using reconciliation theories from scholars like John Paul Lederach (1997) and Eva Hoffman (2002), who highlight the importance of narrative, understanding, and forgiveness in bridging divides.

The article emphasizes key moments in the novel where Nazneen begins to exercise her agency and reconcile her past with her present. These moments are critical in her transition from a passive participant in her circumstances to an active shaper of her future. The research suggests that Ali's depiction of

Nazneen's evolving identity and sense of belonging illustrates a broader theme of reconciliation essential to the diasporic experience.

Lahiri (2019) analyses the concept of gender trauma in the context of immigration. *Brick Lane* illustrates the psychological and emotional impacts of migration on Nazneen, who grapples with cultural dislocation and gender-based oppression. Lahiri argues that the novel portrays these experiences as deeply intertwined with Nazneen's personal and social identity.

3.   Analysis and Discussion

The Greek word *trauma* meaning "wound" may be interpreted in the context of both physical and psychical wounding of an individual. Psychical trauma may be triggered by any catastrophic incidents in life, destruction and war, act of treachery, betrayal and sexual abuse (Heidarizadeh, 2015). Peichl's description of trauma as "a toxic condition, a mixture of intense anxiety, absolute helplessness and a loss of control" (2007, p. 23) may well be applied to defining the diasporic contexts of the immigrants rallying towards economically more advanced part of the world migrating from comparatively less advanced corners such as from countries in South Asian Sub-continent in this context. East London's district Brick Lane in the Borough of Tower Hamlets offered refuge to immigrants for long 400 years. During the late 1950s and early 1960s numerous young male Bengali workers mainly from Sylhet region of Bangladesh (Das, 2013), the then East Pakistan immigrated to London to work in the clothing factories around Brick Lane. With the improvement of their prospects, many brought over their families to this region forming the biggest hub of the Bengali community in diaspora. This "exuberance of immigration" and "the aloofness of expatriation" (Mukherjee, 1990, p. 3) also brought with them identity crisis and culture shock. Along with the issue of identity crisis triggered as an offshoot of migration, "migrant identities are often suffused with traumatic experiences and the attempt to come to terms with them" (Tancke, 2011) and contribute to writing of a saga of intolerable physical as well as psychological sufferings. This paper concentrates on the depiction of psychical wounding which results in subconscious psychological trauma in the female immigrants in *Brick Lane* (2003), a novel written by Monica Ali. In most cases the traumatic experience is caused because of the voluntary but painful immigration performed for the purpose of "so called" changing the social status of the female immigrant and upgrading the overall living condition envisioned by the female immigrant's husband. In most cases in Bangladesh, a woman's course of life is decided by the patriarchs of the family, led by either the father or the son or the husband. Subsequently, the immigration and immigrant life of a woman is also found to be

dictated by the respective patriarchs. Hence, women fall victim to the diaspora-induced crisis and trauma no less than men. According to a demographic study by Samad and Eade (2002) in Tower Hamlets of London, there were more women immigrant than men.

In fact, for the immigrants of any sort, trauma coincides as a byproduct of either compulsory or voluntary dislocation from home to an immigrant milieu. The trauma of displacement (Hron, 2018) from home has always been an important issue in trauma literature. In the present context "home" may be defined as the place of birth and ancestry. In most cases, diasporic writers are haunted by their ancestral homes (Ullah, 2015). However, the female immigrants who are dislocated from comparatively less developed countries of South Asian Sub-continent to the more developed western countries seem to suffer more from multifold trauma which becomes incomprehensible and is ultimately subsided under layers of social impositions created by the conservative notion of nationality (e.g. inflexible stand towards conserving the idea of Bangladeshiness), ethnicity (e.g. Bengali, Chakma etc.), religious perceptions (e.g. Islamic or Hindu ideologies), cultural conformity (Strict social practices/celebrations of festivals e.g. Eid, Puja etc.), gender bias (e.g. prescribed female gender role and male superiority), and economic status (e.g. financially rich, middle class and lower class etc.).

Trauma creates a speechless fright that divides or destroys identity (Balaev, 2008). The critical factors behind this speechless fright include immigrants' socio-economic status in their country of origin, their motivations for leaving, the safety of their journey, and the social context where the immigrants arrive (Portes & Rumbaut, 2001; Rumbaut, 1991). Literature written in diaspora can aptly depict these critical factors and the layers of social impositions. Monica Ali, a writer in diaspora of Bangladeshi origin, juxtaposed immigrant lives with *deshi* (local) ones in *Brick Lane* (2003) and depicted the inertia-stuck protagonist Nazneen's silent acceptance of what comes to her life and exposes her exasperated angst which insidiously wriggles its way out through her inner trauma in silence. Here comes the significant role of literature which enables us to bear witness to events that cannot be completely known and might have otherwise remained unspoken and unheard (Caruth, 1996). The lack of expression intensifies the impact of the trauma which goes unwitnessed, unspoken, and unclaimed. Only the female protagonist's grieving daughter is instrumental to healing the mother's incomprehensible trauma, who helps combine her mother's dissociated self and shows her an escape to freedom. Through the 'collective consciousness' (Durkheim, 1893) of shared experiences Nazneen's individual trauma shifts on a socio-cultural dimension and binds her

together with her daughter Shahana, her husband Chanu and her lover Karim because each individual character is psychologically traumatized for essential dislocation from their home of origin. Shahana is traumatized because she cannot live a dual life between simultaneous confrontation of Western and Eastern values and cultures; Chanu is traumatized because he cannot stabilize his struggle for fluctuating financial settlement; Karim is traumatized because of his solidarity to the retaliation victim of 9/11 in the Muslim community in the UK; Nazneen is traumatized as "an unspoilt girl from the village" (Ali, 2003, p. 16) suffering from the crisis of belongingness. She could not fathom the impact of her migration on her life and created a shell of inertia to shut her inner turmoil within herself. She is torn apart into pieces from the inside, coping with her daughter's embarrassment, on one side, and her husband's resentment, on the other. At that precariously tumultuous edge of her life, Karim's intrusion as a soothing resort ignites her subdued desire for independence and ultimate freedom of her choice. The multiphase traumatic experiences for her recur before, during, and after the migration. Being an unspoilt girl from village, she subconsciously struggles to connect to her origin and construct her identities to conform to the new socio-cultural contexts and expectations of the people. In fact, Nazneen's affective and traumatic encounters with Ammu (her mother) help transform Nazneen from an emotionally dependent wife to an independent Bengali woman living in London (Liu, 2014). In this case, her silent trauma in slumber ironically helps find her own self and establish identity.

The acceptance of this trauma and subsequent resolution to it leads to an attitudinal acceptance of the overall abuse experienced by these sorts of dislocated women. Nazneen initially succumbed to the willingness to see, feel, and accept things just as they were, and later, she epiphanically realized her thirst for freedom which was buried in slumber for so long. In an exploratory study, Karim, Zohra, Swahnberg, and Rahman (2023) identified that the attitudinal acceptance of psychological abuse, physical abuse, abuse on disobeying family obligations, and abuse on challenging male authority were significant phenomena which corelated with the mobility of women and trauma by extension. Trauma has always been the byproduct of any type of psychological and physical abuse categorically identified or not (Brewin, et al., 2009; Felitti, et al., 1998; Herman,1992; Van der Kolk, 2003). Abuse experienced by Nazneen remained undetected which can be characterized as her attitudinal acceptance. Subsequently, her mobility after immigration worked as a catalyst to help identify her freedom and desire that she lacked in her home as well as in diaspora, ultimately leading her to formulate a resolution against the unwanted social impositions and diasporic trauma by reclaiming her identity.

The publicity blurb of *Brick Lane* (Ali, Harper Collins, Doubleday, 2003) endorses Nazneen's unwitnessed hidden trauma when it writes, "Nazneen's inauspicious entry to the world, an apparent stillbirth on the hard mud floor of a Bangladeshi village hut, imbues in her a sense of fatalism that she carries across continents when she is married off to Chanu", (Ali, Harper Collins, 2003, p. 3) a man old enough to be her father. Her subconscious trauma is triggered from a mismatched male entry in her life which is again decided by the society and the traditional norms of an uneducated and backward village context in Bangladesh. "Her life in London's Tower Hamlets is, on the surface, calm" (Ali, Harper Collins, 2003, p.23) but in the rear, a storm of struggles and angst destroys every atom of her "self" the trace of which can occasionally be seen when it peeps to surface for an escape. For her, the psychical trauma operates from the fear of facing the unknown, from the unheard-of insecurity in the new place, from the uncertainty of adjusting to new life, and from the ultimate limbo state for her daughter and herself. "Into that fragile peak, walks Karim. He sets questions before her, of longing and belonging; he sparks in her a turmoil that reflects the community's own; he opens her eyes and directs her gaze…" (Ali, 200, p 35). The numbness of trauma-stricken Naznin is stirred by an agitating as well as subconsciously desired intrusion of an outsider. This escape from the direction-less blurry gaze to a fixed course can be considered as the initial stage of the reconciliation (Lahiri, 2019) process of her psychical trauma.

Her foil Hasina also demonstrates an inner trauma though she is not an immigrant but dislocated from her own root. An unknown fear succumbs to her as a source of inner trauma which she declares in a letter to her confidante sister Nazneen, "[I] hardly dare opening my eye. Why it is? What is bringing fear? God not putting me on earth only to suffer. I know this always even when days bringing no light" (Ali, 2003, p. 18). Her unconditional blind trust in instincts only keeps her dissociated self together. Hasina's continuous struggle to forge her way out to establish her own identity is juxtaposed by Nazneen's passive acceptance of the role and identity assigned to her. The process and politics of identity formation and the fundamental threat to identity create a highly significant mental trauma for these Bengali women, immigrant or not. However, the traumatic experience is threefold corrosive for Nazneen: first as a female (gender), second as an immigrant (dislocation from root) and third as an uneducated individual growing out of a backward village in Bangladesh (education and economic condition). This traumatic experience for Nazneen inwardly shatters her into pieces and "undoes the self by breaking the ongoing narrative, severing the connections among remembered past, lived present, and anticipated future" (Brison, 1999, p. 41).

Even after all these adverse experiences of life, Nazneen, a representative figure for Bangladeshi poor female immigrant, struggles in the quest for and formation of her essential identity breaking through the essentialized role, specifically, imposed on women by the chauvinist Bengali society. Her psychic battle to assemble her disassociated self and dilemma in choosing path for herself cause a subsequent inner trauma in her as she lacks any companion for her own soul. Also, "Nazneen, as both a Bangladeshi immigrant and a woman coming from a patriarchal society, inevitably experiences social and psychological alienation (and subsequent trauma) in certain periods of her life" (Arıkan & Koçsoy, 2010). She was alienated from her "self", from the society she settled in and from the society which she left. She was an indifferent lonely sojourner in an indifferent alien planet as

> *"every person who brushed past her on the pavement, every back she saw, was on a private, urgent mission to execute a precise and demanding plan: to get a promotion today, to be exactly on time for an appointment, to buy a newspaper with the right coins so that the exchange was swift and seamless, to walk without wasting a second and to reach the roadside just as the lights turned red. Nazneen, hobbling and halting, began to be aware of herself. Without a coat, without a suit, without a white face, without a destination…But they were not aware of her… They knew that she existed … but unless she did something, waved a gun, halted the traffic, they would not see her…"* (Ali, 2003, p. 45).

Nazneen's ethnicity and cultural difference remains invisible as "they would not see her" precisely because it is superfluous to capitalist consumer society of the western world where Nazneen, a girl from backward Bangladeshi village is never a matter of attention which makes her extremely lonely and indifferent. This condition plunged her into a psychological separation from the society although back in her own village in Bangladesh, she was an ordinary girl of no special attention from the society, except from her own family or acquaintances. The psychological condition of her life in London surfaced from a dire absence of collective consciousness (Durkheim, 1893). No shared understanding of social norms or beliefs operate for her as a unifying force (Wren, 2012). However, her lonely life in the East End Tower Hamlets represents a microcosm of poor, overcrowded immigrant life throbbing with working-class Bangladeshis and mostly poor white on welfare in a heterogeneous British urban society (Ferguson, 2015; Hawkins, 2016; Moran & Routh, 2014). Her inner trauma is incomprehensible to her surroundings as she cannot make good friends though

she desires to visit *tatoo* lady. Her conservationist cultural orientation could be held responsible for such reservation in mixing with people. And this extremely lonely and indifferent attitude toward "self" for her uncomfortable transcultural positioning can be equated to the symptoms of a Post-Traumatic Stress Disorder (PTSD) (Falsetti, 1993). This encounter may epitomize her "original traumas" the unavoidably painful constants of the immigrant experience (Tancke, 2011). Suddenly an *epiphanic* realization serves as an outlet for her hidden trauma in mental transformation. She declares:

> *"Sometimes I look back and I am shocked. Every day of my life I have prepared for success, worked for it, waited for it, and you don't notice how the days pass until nearly a lifetime is finished. Then it hits you--the thing you have been waiting for has already gone by. And it was going in the other direction. It's like I've been waiting on the wrong side of the road for a bus that was already full." (Ali, 2003)*

On the ground of family orientation and socio-cultural conformity, it is seen that the affective and traumatic encounter with her own mother helps transform Nazneen from an emotionally dependent wife to an independent Bengali woman living in London. The absorbed shock from the encounter of her mother's suicide made her ever stronger and quieter; and subsequently lifeless and inert. Nazneen's extramarital affair with Karim was another cultural obligation which threw her into the crossroad of dilemma "while she wanted to look neither to her past nor her future, she lived exclusively in both in limbo. They had taken different paths, but they had journeyed, so she realized, together." (Ali, 2003, p. 143) Her experiences of migration and multiculturalism have a deeply disturbing underground stream that causes the fundamental sense of loss, rootlessness and un-belongingness (Tancke, 2011) which throws her in a state of limbo. She struggles to come out of the social prescription imposed on her to follow as code of life.

> *"While Nazneen journeys along her path of self-realization, a way haunted by her mother's ghost, her sister Hasina, back in Bangladesh, rushes headlong at her life, first making a "love marriage", then fleeing her violent husband. Woven through the novel, Hasina's letters from Dhaka recount a world of overwhelming adversity. Shaped, yet ultimately not bound, by their landscapes and memories, both sisters struggle to dream themselves out of the rules prescribed for them" (Ali, 2003, p. 228).*

At the end of the novel, Nazneen's decision to stay back serves as an escape from her unwanted bonding, in the formation of which she did not have any role. This ever-desired escape initiates her action of reconciliation for her hidden trauma. This *Icarian* escape gives her boost and makes herself vigorous for living a free life because "the energies that are released when we heal from trauma are the wellspring of our creative, artistic, and poetic sensibilities, and they can be summoned to propel us into the wholeness of our intelligence" (Levine, 2005, p 80). So, a post traumatic experience does not only change her as a person, rather creates a new woman out of her fragmented self as "What could not be changed must be borne… This principle ruled her life… So that when, at the age of thirty-four…when for the first time she could not wait for the future to be revealed but had to make it for herself, she was as startled by her own agency as an infant who waves a clenched fist and strikes itself upon the eye." (Ali, 2003, p. 307) She imagined herself free from any familial injunctions from husband or her own cultural orientation or her mother's up-bringing. So, "suddenly, she was gripped by the idea that if she changed her clothes her entire life would change as well." She would be free by shedding her cultural conformity. Now, she is no longer an "ignorant, poor, uneducated, tradition bound, domesticated, family oriented, victimized" (The Post-Colonial Reader, p. 261). Her trauma turned out to be her liberator. She decided to detach herself from the despair implanted in her very essence by her own culture and pursued to determine the route of her own life (Tancke, 2011). She decided to stay back and accept the hopes that she saw in her new life denying being the passive part of Chanu's (her husband) mythos of return to homeland. This assimilation can be viewed as a reconciliation to the discontents of diaspora and trauma. This way of her reconciliation simultaneously affected the way she as an immigrant looked back towards her native culture.

4. Conclusion

In conclusion, the trauma in the female migrant Nazneen that Monica Ali projects in *Brick Lane* is a byproduct of voluntary immigration to London from Bangladesh. This trauma is not physical by nature rather psychological imposed and inflicted on a woman by her surroundings triggered from her expected gender role, dislocation from the root, lack of education and poor economic condition of the family. In some cases, the society does not directly impose burdens on women, rather it cajoles the women's infinitely adoptive mind to accept the unwanted restrictions and burden of responsibilities. Nazneen's consent to follow the father's decision about her marriage to a man who is old enough to be her father and go to London after the mother's suicide, was a social imposition of an unwanted burden on her which created a traumatic effect on her.

Even her female self-identity is changed into other self, performed, and actualized over time within the social constraints (Suzuki, 2010). The fourteen years of her programmed life with her husband Chanu in Tower Hamlets epitomizes the symptoms of her unwitnessed trauma. Her mother's suicide, her sister's elopement and subsequent struggling life, her husband Chanu's unsettlement and mythos of returns, her daughter's confusion in living a dual life were directly or indirectly the causes of her ultimate trauma in immigrant life, and as a solution to this, her encounter with Karim helped her overcome the trauma positively with the discovery of her identity and freedom.

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