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Contents

Revolutionizing Production: The Impact of 4IR on Factory Management of Ready-Made Garment Industry in Bangladesh Shaikh Shamsul Arafin¹, Md. Salah Uddin, Md. Sohel Rana	01
Does Good Governance Matter for FDI Inflows? Evidence from Bangladesh A H M Ziaul Haq, A S M Kamruzzaman	36
Role of Bangladesh Small and Cottage Industries Corporation in Entrepreneurial Development: A Case of Selected Districts in Northern Zone of Bangladesh Md. Mahbubul Kabir, ANM Jahangir Kabir, Md. Shawan Uddin	68
Exploring Challenges and Opportunities in the Pottery Industry of the Northern Zone of Bangladesh Md. Sohel Rana, Md Shawan Uddin, Samir Bhadra, Md. Nuruzzaman, Md. Mahabubar Rahman	96
Exploring Conflict Dynamics and Management in the Telecommunication Industry in Bangladesh: A Qualitative Approach Md. Kutub Uddin, Md. Shawan Uddin, ANM Jahangir Kabir	112
Assessing BNQF Standards: A Study on Some Selected Universities in Bangladesh Md. Shawan Uddin, Md. Mahabub Alam, Md. Kutub Uddin, Joy Barua	134

Revolutionizing Production: The Impact of 4IR on Factory Management of Ready-Made Garment Industry in Bangladesh

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Abstract

This study aims to provide insights into the impacts of the Fourth Industrial Revolution (4IR) on the factory management of the Ready-Made Garment (RMG) industry in Bangladesh. The researchers employed a qualitative field research approach to collect data from 18 respondents selected through purposive sampling from stakeholders within the RMG industry of Bangladesh. A semi-structured questionnaire was utilized to ascertain the impacts of the 4IR on factory management within the study's scope. Subsequently, the data interpretation is obtained through a rigorous thematic analysis. The study reveals the significant impacts of the 4IR on the RMG industry of Bangladesh, marked by the widespread adoption of digital industrial technologies and automation in factory management processes. Automation, propelled by 4IR, has resulted in improved precision and efficiency in production processes. This automation not only minimizes human intervention but also contributes to cost reduction, while simultaneously yielding social benefits and addressing ethical imperatives. The findings underscore the importance of proactive policy interventions to address the challenges and opportunities associated with 4IR adoption. Strategies focusing on education, skills development, and supportive policies are essential for facilitating a smooth transition toward digitalized factory management while ensuring equitable benefits for all stakeholders.

Keywords: Industrial revolution; industry 4.0; internet of things; production management; Ready-made garments (RMG).

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1. Introduction

The 4IR has emerged as a pervasive term, yet many individuals remain unaware of its profound implications on their daily lives within this new digital landscape. Across various sectors, the integration of automation, biological sciences, blockchain, artificial intelligence (AI), augmented reality (AR), 3D printing, and the Internet of Things (IoT) is progressively displacing human labor (Park, 2018). However, the effectiveness of these contemporary technologies varies significantly based on a nation's cultural, societal, political, and economic contexts. The concept of the 'Fourth Industrial Revolution', often synonymous with 'Industry 4.0', originates from Germany's initiative between 2011 and 2015, focusing on digital technology's role in production (García & García, 2019; Kagermann et al., 2013). 4IR holds tremendous promise, encompassing customer satisfaction, enhanced adaptability, streamlined decision-making, improved worker efficiency, novel service creation, and addressing social challenges such as work-life balance and demographic shifts. Following previous industrial revolutions, 4IR marks a pivotal shift toward digital integration across the entire value chain, horizontal networking within the value network, and vertical integration within manufacturing systems (Rüßmann et al., 2015). This paradigmatic transformation is propelled by foundational technological advancements, amalgamating technologies, business processes, and data processing into a novel industrial framework (Bordeleau et al., 2018).

The 4IR aspirations extend beyond efficiency gains to foster innovation, address social issues, and cater to evolving consumer demands while maintaining competitiveness in a globalized market. Achieving these objectives necessitates the seamless integration of vertical and horizontal processes, transforming industrial production to accommodate personalized products without sacrificing economies of scale. The ongoing evolution from mass manufacturing to personalized production entails a series of incremental steps, with data analytics, artificial intelligence, additive manufacturing, and simulation playing pivotal roles (Brettel et al., 2014). Consequently, 4IR not only revolutionizes production processes but also redefines the relationship between humans, machines, and tasks, emphasizing flexibility and adaptability.

The potential for revolutionizing manufacturing and industrial management is enormous with the Fourth Industrial Revolution (4IR). Some of the key benefits of

4IR are increased customer satisfaction, flexibility, simpler decision-making, increased worker productivity, creative service creation, and addressing social challenges like work-life balance and demographic shifts (George, 2024; David et al., 2022; Explainers, 2022). In contrast to other industrial revolutions, 4IR is characterized by vertical integration inside production systems, horizontal networking within the value chain, and widespread digital transformation throughout the entire value chain (Castelo-Branco, 2022). Fundamental technological developments that combine business procedures, data processing, and technology into a new industrial framework are what contribute to this paradigm shift.

In addition to increasing efficiency, the 4IR seeks to fulfill changing customer demands, promote innovation, and solve social issues all while being competitive in a globalized market. The smooth integration of vertical and horizontal processes is necessary to achieve these aims, changing industrial production to allow customized goods without sacrificing economies of scale (Bhuiyan, 2020). A number of incremental steps are required to make the shift from mass manufacturing to customized production, and simulation, artificial intelligence, data analytics, and additive manufacturing are all important components (Castelo-Branco, 2022).

In the context of the RMG industry in Bangladesh, automation adoption is seen as crucial for maintaining efficiency and competitiveness (Farhana et al., 2022). However, the sector's reliance on manual labor and concerns about job loss necessitates careful consideration and strategic planning. The Bangladesh Garment Manufacturers and Exporters Association (BGMEA) faces the challenge of leveraging the latest technological developments to enhance competitiveness while addressing socio-economic concerns such as job displacement and gender disparities in RMG. Collaborative efforts between the Bangladesh Government and BGMEA are necessary to modernize infrastructure and establish a digital ecosystem to promote sustainable growth of this industry. Moreover, the integration of innovative frameworks and technologies is essential for the RMG sector in Bangladesh to remain competitive in the global market (Rahman & Maniam, 2022). In light of these challenges and opportunities, this study raises the research question: What are the impacts that the RMG industry of Bangladesh might encounter in its factory management as a result of 4IR? To address this question, this study aims to provide insights into the impacts of 4IR on the factory

management of the RMG industry in Bangladesh. This paper is further organized including a literature review, methodology, demographic discussion of the respondent, findings, and discussion of the themes, implications, limitations, and future research agenda.

2. Literature Review

Professor Klaus Schwab, the founder and executive chairman of the "World Economic Forum," describes the 4IR as a major worry and a topic of discussion around the world, including Bangladesh. Experts predict that the 4IR will be marked by major industrial advancement with developing technologies such as robots, AI, 5G, nanotechnology, fully automated cars, and so on, similar to the third industrial revolution. To showcase a manufacturing revolution, 4IR is referred to in a variety of ways; for example, in the United States, it is referred to as the Manufacturing Renaissance, but in China, it is referred to as Made in China 2025 (MAPI Foundation, 2015; BDI, 2016). However, Germany's progress is considerably more noticeable than that of other countries; for example, German experts say that they are already at level 3.8 and that reaching 100 percent and 4IR production will take a decade, if not less. This is due to the fact that a corporation cannot migrate from 3.0 to 4.0 in a single day or step, as the process takes time and involves several stages. Even though 4IR is well-known and in use in several Western nations, the term is foreign to many important strategists and managers across a wide range of nations (Leiden et al., 2018; Cleverism, 2018). 4IR, on the other hand, is critical for manufacturing-dependent countries that are seeing rapid economic growth as a result of their exports.

Industry 4.0 transforms industrial management through the smooth integration of interconnected systems and the use of data science, machine learning, and artificial intelligence to improve decision-making, optimize operations, and provide a workforce with the necessary skills to use cutting-edge technologies. By seamlessly combining the Internet of Things (IoT), sophisticated connectivity, and cyber-physical systems, Industry 4.0 transforms plant management and can result in significant cost savings and improved operational efficiency (Orellana & Torres, 2019).

Industry 4.0 revolutionizes industrial management through the integration of cutting-edge systems that optimize operations and decision-making by enabling intelligent control, real-time data interchange, and seamless connectivity between machines, people, and processes (Zhong et al., 2017). According to Constantinescu

et al. (2014), the fourth industrial revolution improves factory management by allowing systems to communicate and exchange information. This allows for just-in-time information retrieval to support decision-making and lessen cognitive overload for human stakeholders.

According to Nagpal et. al. (2019), the fourth industrial revolution streamlines production processes by improving factory management through IIoT integration, enabling real-time monitoring, intelligent device communication, and decreased downtime via automated notifications. Moreover, industry 4.0 improves factory management through intelligent manufacturing, increased efficiency, and flexibility. This allows for better process planning and risk management while promoting sustainable business models (Kumar, Zindani, and Davim 2019). Through automation, real-time data analysis, and networked smart devices, the fourth industrial revolution improves factory management and makes it possible for more effective operations, predictive maintenance, and better decision-making (Pagnon, 2017). By allowing for self-organization and self-optimization through dynamic predictive decision-making based on broad data usage, the fourth industrial revolution improves factory management through enhanced flexibility, agility, and efficiency (Ebrahimi, Baboli, & Rother, 2018). By using cutting-edge digital technologies, the Fourth Industrial Revolution improves factory management, resulting in higher productivity and better results both inside and between businesses (Margherita, & Braccini, 2021).

Bangladesh, a nation in the Asia-Pacific area, has one of the fastest-rising economies, with a Gross Domestic Product (GDP) that has been averaging between 6 and 8 percent for the past 20 years. By 2030, Bangladesh is expected to have the twenty-eighth-largest economy in the world (Humphrey, 2019), with export earnings expanding at a significant rate of around 10% percent with occasional variations. Despite facing domestic and international challenges, Bangladesh's economy has achieved robust growth, reduced inflation, increased foreign exchange reserves, and a stable GDP due to prudent macroeconomic policies and structural reforms(Humphrey, 2019). The Fourth Industrial Revolution (4IR) offers significant opportunities for Bangladesh, but realizing these benefits requires concerted action from both the government and private organizations. The manufacturing and service sectors must adopt and implement 4IR technologies, and businesses with substantial investments can accelerate production and drive economic growth by embracing 4IR processes(Moktadir, et al., 2018).

In the meantime, several obstacles hinder the adoption of 4IR technologies in Bangladesh, including insufficient expertise, worker skills, factory equipment, funding, and application of technology in manufacturing. To fully capitalize on the opportunities presented by the Fourth Industrial Revolution, the government and private sector must collaborate to address these challenges and drive economic growth(Sarkar et al., 2017).

Rapid technological advancements are transforming the apparel and fashion industry, and Bangladesh's RMG sector, a \$38.52 billion export, is at the forefront of this transformation. The sector's commitment to sustainability is evident in the construction of 135 environmentally friendly green buildings, the most globally.Hence, the adoption of 4IR technologies is crucial for garment factories to remain competitive in the global market. 4IR aims to revolutionize industrial production through the integration of information and technology.Additionally, the 4IR production system offers greater sophistication and adaptability, allowing businesses to produce customized products more efficiently. This is a game-changer for industrial countries that rely heavily on manufacturing and exports(Benayoune et al., 2021). Consequently, 4IR offers substantial benefits, such as increased efficiency, productivity, and innovation. Automation and digitization can streamline production processes, reduce costs, and facilitate faster decision-making, leading to economic growth.

Despite concerns about job displacement and skill shifts, there is a lack of research examining the specific impacts of 4IR on employment dynamics in Bangladesh. Investigating the sector-specific implications of automation and technological advancements on job creation, job quality, and workforce reskilling would provide a more nuanced understanding of the socio-economic implications of 4IR.To fully understand the implications of 4IR adoption in Bangladesh, it is crucial to research environmental and social sustainability considerations. While there is a focus on economic growth, studies examining the potential environmental risks, resource implications, and social equity considerations would provide valuable insights for policymakers and industry stakeholders.Addressing these research gaps would not only advance scholarly understanding of 4IR in Bangladesh but also provide actionable insights for policymakers, industry practitioners, and other stakeholders navigating technological transformation in the RMG Industry.

3. Methodology

The researcher employed a qualitative field research approach to collect data from the RMG industry of Bangladesh to explore the answers to the research questions of this study. Data was collected from 18 respondents. The data was collected from four RMG factories i.e. 1 from Dhaka, 1 from Narayanganj, 1 from Chittagong, and 1 From Ishwardi EPZ. This study employs purposive sampling because, in Bangladesh, very few garment factories have adopted advanced technologies that promote Industry 4.0. Therefore, the researchers purposefully selected the garment factories that have been using advanced technologies and machines in the production system. The prominent objective for selecting purposive sampling was to explore the impact of Industry 4.0 on production management. The face-to-face in-depth interviews were used to further understand and analyze the impacts of 4IR on the factory management of the RMG industry of Bangladesh. After going through an extensive literature review the project directors prepared a semi-structured questionnaire to explore the impact of the fourth industrial revolution on the production management in the garments factories in Bangladesh. The interviews were scheduled at the convenience of the participants. The researchers prepared and maintained a detailed interview protocol before and during the interview session with the respondents. Each interview lasted between 30 minutes and an hour. During the interview, participants were requested to authorize the mobile recorder to capture their voice. Only one of the participants refused to record his interview session. In such a case, essential points were written down as notes. The data analysis of this study started from the very first interview. After finishing the interview sessions with the respondents, the recorded raw data was transcribed accordingly. However, the data analysis follows a rigorous process to generate themes for this study. For example, this study transcribed the raw recorded data and then identified several codes from the transcription. The codes were then further categorized and finally, several themes emerged. The respondents of this study have been selected from different departments in the factory. The respondents are diversified with gender, age, and experience. The details of respondents' demography are given in the following table 1.

Table 1: Demographic Profile of the Respondents

Sl. No	Code	Gender	Age	Role	Experience	Education	Study Area
1	WRK1	F	35	Worker	10 Years	Under SSC	Narayanganj
2	WRK2	F	36	Worker	9 Years	Under SSC	Chattogram
3	WRK3	M	29	Worker	5 Years	Under HSC	Narayanganj
4	WRK4	F	35	Worker	8 Years	Under HSC	Chattogram
5	WRK5	F	45	Worker	13 Years	Under SSC	Ishwardi EPZ
6	WRK6	M	40	Worker	10 Years	HSC	Narayanganj
7	WRK7	M	37	Worker	10 Years	SSC	Narayanganj
8	WRK8	F	35	Worker	16 Years	Under SSC	Chattogram
9	WRK9	F	48	Worker	25 Years	Under SSC	Ishwardi EPZ
10	WRK10	M	33	Worker	11 Years	Under SSC	Narayanganj
11	ORM 1	M	39	Operations Manager	10 Years	Masters	Narayanganj
12	ORM 2	F	43	Operations Manager	15 Years	Masters	Chattogram
13	ORM 3	M	37	Operations Manager	11 Years	Masters	Ishwardi EPZ
14	LNM1	M	39	Line Manager	12 Years	Bachelor	Narayanganj
15	LNM2	M	48	Line Manager	32 Years	Bachelor	Chattogram
16	LNM3	M	38	Line Manager	11 Years	Bachelor	Ishwardi EPZ
17	FSV1	F	42	Floor Supervisor	14 Years	HSC	Narayanganj
18	FSV1	F	45	Floor Supervisor	15 Years	SSC	Chattogram

Note: **WRK:**Worker, **ORM:**Operations Manager, **LNM:**Line Manager, **FSV:**Floor Supervisor

4. Findings and Discussion

The study identified several key themes, including organizational perspectives on precision in the production process and social impacts, organizational and social factors such as intervention on humans and economic considerations, and broader societal and household implications like ethical imperatives, emotional intelligence, and social and human concern. These themes are interconnected and highlight the complex interplay between various aspects of the study's focus.

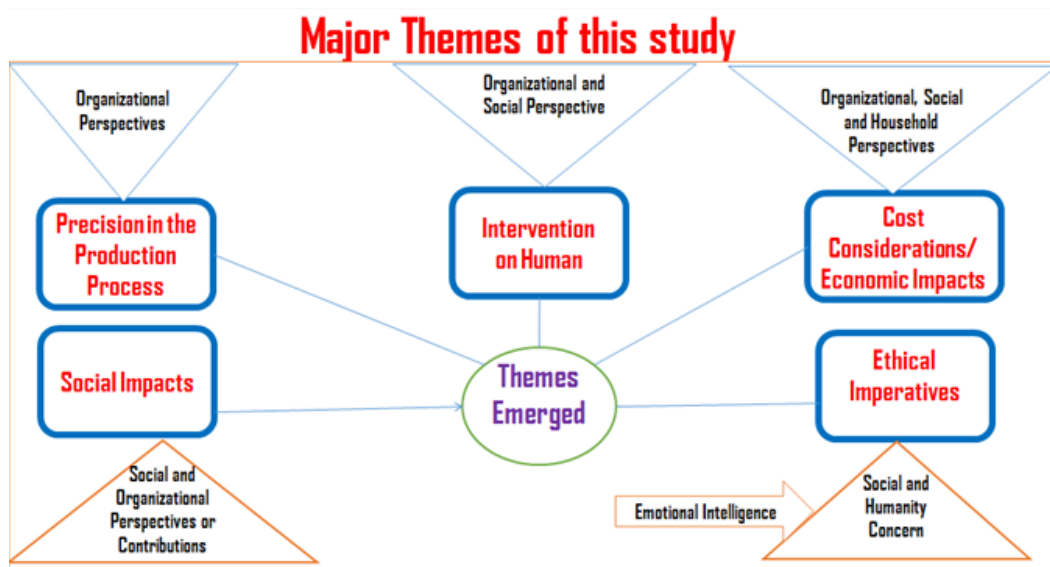


Figure 1: Developed by the Authors

4.1 Discussion of Theme 1: Precision in the Production Process

During the very beginning of the Industrial Revolution, advances in technology spurred tremendous gains in industrial productivity. However, we are currently in the middle of a fourth wave of technical progress. 4IR is going to allow the collection and analysis of data across machines, allowing for quicker, more flexible, more efficient processes to manufacture higher-quality items at lower prices. Initially, automation reduces the number of human contacts in any given manufacturing segment. However, it boosts productivity, quality, and cost benefits, resulting in increased growth and employment in apparel businesses. The RMG industry in Bangladesh has been experiencing a change that includes the digitalization of garment production processes. The 4IR production system is more adaptable and intelligent, allowing enterprises to produce more customized goods more efficiently. Since the term ‘Industry 4.0’ is frequently used to identify the developing progression in managing production and manufacturing as well as chain production, it is of significant relevance for emerging industrial countries that rely heavily on production and export (Benayoune et al., 2021). Following the discussion and interview, the first theme of this study is precision in the production process and it is further divided into the following categories.

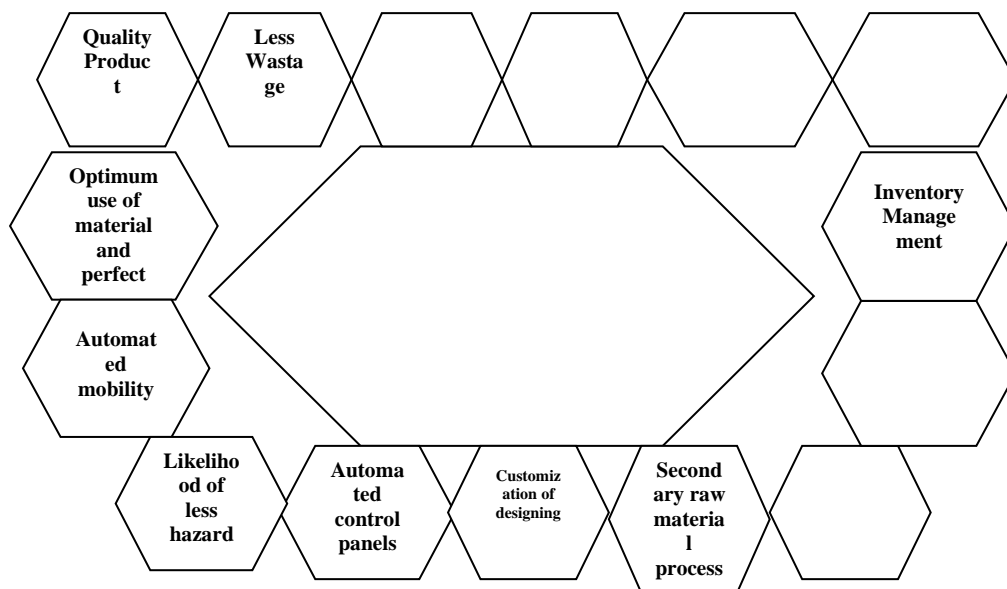


Figure 2: Developed by Authors

The industrial sector has become highly competitive in terms of cost, time, market penetration, and quality. The competition with other countries like China and India in Asia is not only based on productivity but also based on quality (Masud et. al., 2009). That is why it needs continuous monitoring and improvement for mass production. Automation in production systems has caused significant changes in the industry recently.

WRK1 and WRK5 stated

"Product quality is one of the most pressing issues confronting global garment productivity." Quality is determined by characteristics such as fiber qualities, fabric type, weight, thickness, strength, needle count, machine speeds, yarn tension, and stitch per inch. An intelligent system may considerably reduce this issue by detecting future thread breakdowns. In our industry, automation systems have been deployed for continuous quality monitoring and reducing the dominant source of quality loss."

In addition to improving accuracy and reducing waste, computer-aided design and manufacturing (CAD/CAM) tools have made it possible for us to compare and contrast designs that have already been done, ideas for designs, and other references. All of these may be combined and analyzed with the use of computers (Sawy, 2016).

OM1 discussed that

"Automation brings accuracy. Machines may be designed to consistently create objects or garment parts, resulting in minimal waste. Fabric cutting, for example, is more precise when done by machine because it eliminates the risk of human error that occurs when done by hand. This reduces the possibility of future product recalls, allowing companies to deliver consistent quality to customers."

LNMI and FSV1 evidence that

"It is true that machines work quicker than humans. Instead of spending hours manually distributing layers of fabric, automated spreading devices can handle up to 90 meters of fabric each minute. As a consequence, lead times are lowered since manufacturers no longer have to wait for manual labor to complete orders."

The genuine leather, fashion accessory, and trim sectors as well as the apparel business are all regarded as components of the worldwide fashion sector (Nayak et al., 2017). The supply chain management (SCM) logistic providers for the apparel and textile industries, retail establishments, and retailers that handle the recycling of used clothing are all regarded as components of the fashionable production process.

ORM2 stated that

"Our industry re-used water in toilets, gardening, and industry by recycling through automation. Wastes are also used in the field for fertilizing the land."

By the statement of FSV1, LM3 and WRK9

"By leveraging automation to consistently hit order deadlines and avoid product defects, manufacturers can increase customer satisfaction, and in turn, their reputation. The greater the reputation, the more customers will flock to a manufacturer with bulk orders."

The labor-intensive nature of textile production is generally accompanied by a high standard of quality. Therefore, in order to meet the high standards for quality, manual operations must be transformed into automated ones. This can be achieved through the use of digital elements, computational tools, and artificial intelligence (AI) (Nayak et al., 2020).

"Linked together to collect and share data, integrated machines are guaranteed to boost factory productivity. By remotely reviewing and collating data such as quality control pass and fail rates, integrated machines help managers make decisions on the go. Managers get to view data for an entire fleet of garment machines at a glance instead of individually, letting them optimize production in a timely fashion" statement by, **W6, W8, and W10**

Through appropriate inventory management, new technologies may be introduced into the garment production process, resulting in a significant boost in productivity and work quality.

WRK8 and WRK10 reveal that

“Automated factories work smarter. Automation affords manufacturers greater control over the entire production process by keeping everything in-house. This enhances factory managers’ oversight of production while letting them cut loose from external suppliers that are susceptible to delays.”

The styles and designs of clothing determine the extent of adoption of new technologies and automation in numerous cases. For example, a clothing factory making men's shirts can use automatic equipment for attaching cuffs and collars, which is now commonly accessible at a reasonable price (Nayak & Padhye, 2018).

ORM 2 and LNM2 stated that

“As social media increases public awareness of fashion trends, garment manufacturers need to find new ways to keep up. More and more garment manufacturers are looking to manufacturing automation to remain current. For most, the only way to meet demand while cutting costs is to use computerized systems designed to streamline production and handle bulk orders.”

The statement found from WRK3, WRK6, LNM4

Machines maintain high productivity levels without tiring the way humans do. Moreover, machines do not require toilet or lunch breaks, sick days, or time for staff handovers at the beginning of a new shift. Machines make products of the same quality even under challenging working conditions, which is impossible for manual workers to achieve. By increasing productivity, heavy-duty automated machines let manufacturers take on bulk orders and enhance overall turnover.

Automation does not encourage restoring, but it may promote manufacturing site relocation activities at the hubs of global value networks. It boosts productivity, quality, and cost benefits, resulting in increased growth and employment in apparel companies. When automation is successfully implemented in the system, the employment of unskilled personnel is reduced in the long term.

ORM3 stated

“We use up-to-date water recycling methods, own electricity supply plan, and produce other supplementary raw materials in one ground.”

LNM2 and ORM3 evidence that

"Advanced automation systems can also enable textile manufacturers to achieve higher levels of customization, allowing them to produce smaller runs of specialized products quickly and affordably." This is especially critical in an industry where fashion and trends change quickly and organizations must be more sensitive to consumers' wants."

WRK1, WRK3 and WRK5 told the significant of incorporating 4IR that is

"The enhanced uniformity and efficiency of automated technology allows producers to correctly forecast demand and arrange advance orders for raw supplies. Because of advanced planning, manufacturers only buy what they need, eliminating fabric waste from over-ordering."

They also raised the issues of likelihood are less hazardous and stated

"Another significant advantage of automation in the textile sector is safety. Automated machines can do risky jobs such as handling heavy goods or running machinery, lowering the risk of worker harm. Furthermore, automation can assist to decrease the danger of fire and other risks, which is especially significant in textile plants that often employ combustible materials."

Statement by WRK5 and WRK6,

"Automated solutions may accomplish jobs faster, more accurately, and reliably, reducing lead times and speeding up production cycles. As a consequence, Bangladesh's textile industry is able to handle large orders, meet deadlines, and maintain a competitive edge in the worldwide market."

ORM1 given the opinion-

"Integrated machines are sure to increase manufacturing production since they are linked together to gather and share data. Integrated machines assist managers in making choices on the fly by remotely examining and compiling data such as quality control pass and fail rates. Managers may now access data for a full fleet of garment machines at a glance rather than individually, allowing them to improve output in real-time."

4.2 Discussion of Theme 2: Intervention on Human

In a 2016 research, the UN's International Labor Organization warned that as automation increases, some Asian countries could lose over 80% of their jobs in the textile, clothing, and garment industries. Automation is the technique of

controlling machinery and procedures in industries without the need for human operators by using computerized systems like computers.

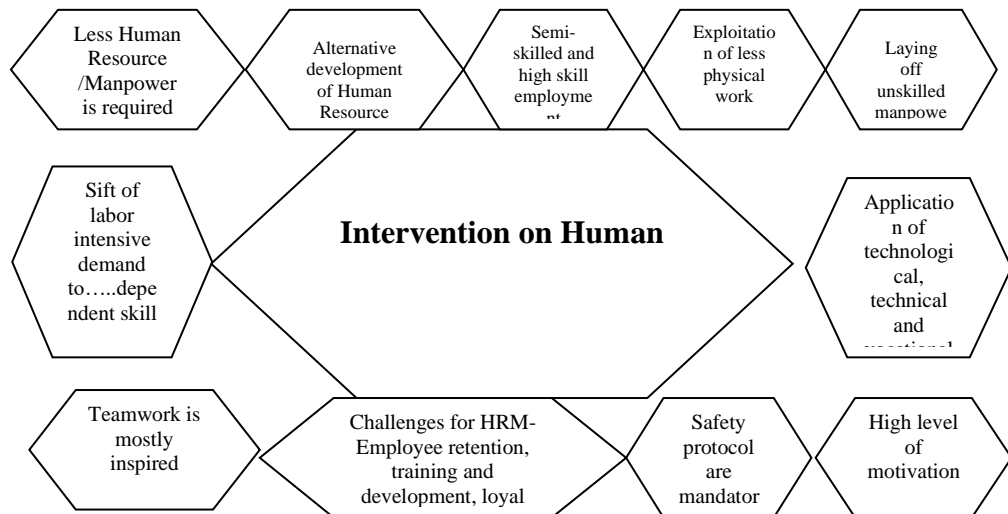


Figure 3: Developed by the Authors

Automation has boosted production while decreasing the need for labor." Many businesses are currently utilizing these technologies. When robot technology transforms into accessible, labor will be further reduced. Many individuals are already seeking new positions in various industries.

LNMI and ORM 2 discussed

"Due to the upfront expenditures of automation adoption, it may want to minimize expenses and shrink its personnel. There are also fears that the speed of automation adoption may outpace the workforce's ability to react, potentially leading to social and economic disparities. Various modern technologies, such as 3D printing, CAD, 3D body scanning, and robotics applications, may require fewer workers."

Numerous workers are losing their employment as a result of automation. This is considered to be one of the primary causes of the job reduction. Many people do not, however, view it as a threat because; in one way or a different nation this industry employs all of the Bangladeshi workers who are losing their jobs as a result of automation.

WRK2 stated that

“There is no effective alternative action taken by the factory that gives us fruitful benefits. The lead mental stress”

LNM2 argued that

“We believe that we have limitations but our factory ensures little opportunity for the development of employees suffer by the implication of automation. Sometimes we rotated the employees to their suitable place.”

“We promote job security by investing in upskilling and reskilling programs that allow their workers to adapt to technological advancements and take on higher-value roles. You combine the strengths of automation with the expertise and creativity of the workforce. There will be some new jobs emerging because of the automation, which will provide employment.” As discussed by ORMI

FSV2 and LNM1 evidence shows that

“In our factory, the cutting sector used to employ 150-200 people, but today just 10-12 people utilize automatic cutting equipment. Again, while four people were required to manufacture a rear pocket for jeans, it is now done with one machine. In other words, one operator performs the work of four workers.”

Due to continuous automation, several sweater factories had to fire employees because jacquard machines could perform comparable tasks far more effectively and efficiently. Even if only large clothing factories have started adopting AI applications, there is still cause for concern regarding potential job losses in this industry in the future, even though there hasn't been a wide-scale termination of RMG workers yet. Less human labor is needed to operate machines when they are more computerized and automated technology can recognize and (sometimes) resolve problems on its own. This results in unemployment, especially for those who lack skills or knowledge of technology (Akter et al., 2022).

“Many workers may lose their employment as a result of automation, as automated technology may accomplish the work of numerous individuals. As a result, the workers executing the task will be at risk of losing their employment due to automation.”

Automation may result in the creation of new jobs in analyzing data, creation of technology, and support.

ORM1 and LNM2 clearly stated

"We predict that this move will widen the gap between those with suitable skills and those who do not, thereby increasing income inequality. While I am not convinced of this, the problem of skills does emphasize the need for increased investment in skills and training as automation increases."

Interesting ideas are linked to automation. Automation is an autonomous framework of machines that goes beyond the simple technological replacement of human labor. Stone (2016) integrated the idea of automation with a computer-aided system and suggested that drivers will still be needed even with advanced technology.

"We know that in the textile industry, fabrics are made from yarn and yarn from fiber. Then dyeing and printing are done to make the fabric more attractive. Every step of it, especially the spinning, weaving, and dyeing process, can be dangerous for anyone. So, automation has created automatic machine equipment to handle most of these processes by securing working conditions for all in the textile industry." **Started by WRK4, WRK6, WRK9**

WRK2, WRK4, WRK9 and FSV2 told that

"Previously we are working in some critical areas and there is a change of physical damage at any time. By the employment of automation robots automatically did it without any physical damage."

Supported by ORM2

"Automation eliminates or reduces the need for repetitive and physically demanding tasks, improving workplace safety and reducing the risk of injuries associated with manual labour."

Personnel education and training are essential for success in any endeavor; simply modernizing tech won't produce the desired outcomes (Schumacher, 2001). Organizations 'adaptability, production, competence, safety, and ultimately profit are positively influenced by training (Salas, 2001); the Bangladeshi RMG sector is no exception. Factory owners from this sector realize the importance of training programs; however, to them, in some cases, training is somewhat effective and in others, it does not have any desired impact. A sincere management of compliance might fetch various benefits for the RMG sector, such as minimizing labor unrest, meeting customer demands, obtaining a better quote, decreasing unemployment,

boosting employee morale, raising the quality of the product, enhancing occupational health and safety, making a good impression internationally, and cultivating positive relationships with authorities (Das et al., 2021).

Evidence from ORM 3

“We have a number of excellent in-house training facilities in the industry that are used to retain experienced employees in the workplace. Workers are enthusiastic about training and recognize its value in the workplace and at your place of work.”

Leadership in operations and structure is required for automation awareness-raising, gathering resources, and automation. Develop your leadership skills and abilities to keep up with developments and shifts that spur teamwork, and move more quickly than the rate of change (Hensellek, 2020).

WRK3 and LNM3 discussed

“automation in the production of garments including fabric inspection, cad & cam, grading, pattern making, fabric spreading and cutting, sewing, pressing, material handling and radio frequency identification (RFID) in a single process. Soteamwork is mostly inspired.”

For the ready-made clothing business to thrive in the global market, automation and factory quality improvement require particular attention. Because automation and a shorter lead time are now essential to the apparel industry's future success. One needs to be up to date on the latest tools and technology to compete. Automation is one such problem at the moment. Thus, the owners of clothing companies have just lately begun utilizing automated equipment in their factories. This Sort of machine-dependent expertise from labor-intensive demand.

“The potential for job displacement as machines and robotics replace human workers in repetitive and labour-intensive tasks. This could lead to millions facing unemployment and there would arise a need for deskilling masse so that workers adapt to the changing technological landscape. Technically skilled personnel are required to operate this equipment with modern technology and high quality. So, the demand for skilled textile workers is increasing with automation.” As stated by WRK3, FSV1.

7.3 Discussion of Theme 3: Cost Consideration/ Economics Impacts

Automation has resulted in cost savings in the apparel industry. By replacing automated technology for labor-intensive operations, the sector has reduced its reliance on physical labor, which may be expensive and sensitive to a variety of labor-related concerns. Automation helps to cut labor expenditures such as wages, benefits, and training expenses. Furthermore, as compared to human work, automated systems consume fewer resources and need less maintenance. As a result of the cost reduction, Bangladeshi apparel makers' profitability has grown.

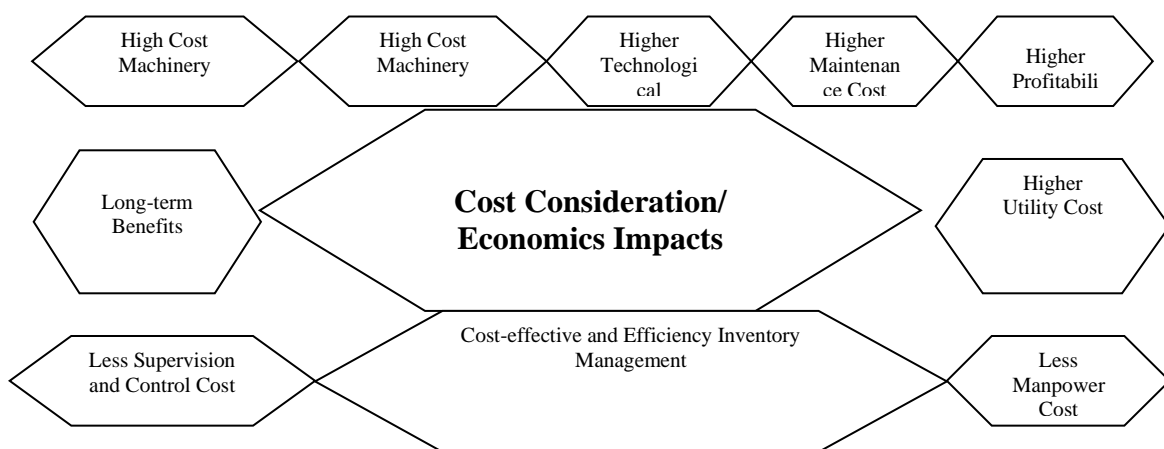


Figure 4: Developed by the Authors

Bangladesh's textile and clothing sector pays less than average wages for labor-intensive occupations that are done by people. But in the case of automation, which calls for expensive apparatus and technology, that is usually the case (Shearer, 2010). Additionally, as more skilled labor is required for the creation of garments with added value, the need for workers will not decrease.

ORM 1 stated that

"The initial investment to automate the garment manufacturing process is significant. But, the return on investment in automation technology is very low in the initial days. The net cost savings can be gained in a short period."

The 4IR is built on nine pillars that aim to reduce costs and delivery time, improve efficiency and productivity, enable customization for customer satisfaction, shift toward environmentally friendly practices to reduce waste and create a sustainable competitive advantage (Sharmin, 2022).

ORM 3 and LNM 2 discussed

"As the current social media-fueled fast fashion trend spreads across the globe, buyers' expected lead time has decreased, creating a significant demand for technology-driven efficiency improvement in the value chain." Sales growth has benefitted industrial players that have used new technologies in their manufacturing processes."

Labor is a key component of the garment manufacturing process, and the cost of keeping a large number of laborers raises this dependency. The industry occasionally deals with problems related to a lack of workers and high absenteeism. Reducing the demand for human labor in the apparel business can be achieved by implementing automation. Consequently, lower expenses, quicker production, etc.

ORM 3 and LNM 2 discussed

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Thus, the aforementioned Bangladeshi clothing units have seen great benefits from the deployment of these technologies. These industries have seen a decrease in lead times in addition to the enhancement of RMG goods' quality and quantity, which has increased profitability (Hasan et al., 2022).

LNM2 reveals that *"we have huge maintenance cost on operating machinery in the floor. The main reason for this cost, most of the machinery is exported from foreign countries and the supplementary equipment is not available at all times. It may hamper regular production."*

Higher Utility Cost 4IRs have made the manufacturing of clothes more efficient, less expensive, more productive, more adaptable, better at predicting trends, and more environmentally friendly. By determining its potential benefits while managing its challenges, such as increased machine and software operation costs (Ahmmed, 2023).

ORM 1 stated

“We considered continuous electrical supply when using technology in our operation. We generate our electricity, which is sometimes more than they need for an unbroken power supply. As a result, we have paid a hefty sum for electricity supplies.”

Manufacturers may now lower labor expenses, improve manufacturing quality and speed, and save production costs thanks to automation. Furthermore, automation has made production processes more adaptable and efficient, enabling businesses to react swiftly to shifting consumer expectations. It is thought that cutting production costs by 30–40% using sophisticated technology also has positive knock-on effects on productivity and lead time.

LNM1 and ORM3 reveal that

“We experienced significant improvements in store and cutting system procedures and efficiency after using existing raw materials. Once applied correctly, technology may provide the quickest return on investment (ROI) through greater production, efficiency, and streamlined supply chain management.”

Industries may now make garments more rapidly, effectively, and affordably due to technological advancements. It aids in the generation of less garbage, as RMG is one of the industries in the world that generates the most waste. Excessive manufacturing, driven by great demand for creative patterns, may result in a slew of issues, including increased chemical waste during manufacture and hundreds of tons of garbage from abandoned clothing.

ORM1 stated

“Our garment business employs raw materials like textile-related and cuttings, and inventory management can be pricey at times. After technology application, we get inventory management solutions to reduce inventory management costs.”

The garment sector is undergoing a dramatic shift known as the 4IR. This is referred to as Apparel 4.0. It is capable of monitoring businesses using new technologies such as IoT, AI, and cloud computing, as well as delivering services in the manufacturing process with complete neutral delivery. Technology has had a significant influence on the textile and garment industries. A new vista of possibilities has been opened in Bangladesh’s garment sector as a result of this revolutionary development (Shabur et al., 2023).

Statement by FSV2 and LNM3

"We recently accompanied new technology that designed an interconnection within multiple technologies, allowing for improved monitoring and coordination with less human interaction. With a single order, automated processes may operate on many parts of fashion design, development, and manufacturing. For that, it saves both money and time in production and operation."

Since automation takes time, practically every factory has already automated the knitting and washing departments. The swing, the most significant component of RMG, has been used by two-thirds of large companies.

The manual method will be more pleasant for many garment workers. They could have a harder time understanding the procedure when it comes to switching to digital technologies. Therefore, it can lead to lower production in the early going. However, long-term objectives of technology adaptation are far superior to immediate setbacks.

ORM3 told that

"We can create patterns using computer software, which saves time and requires very little manpower. Nowadays we are leaning towards computer-aided design (CAD) software, which allows us to easily create patterns of different parts of different garments and save them in computer memory for a long time."

Supported statement by LNM2

"We installed machineries that give us service long time without any major changes. We will use the previous design by saving data and access information easily."

4.4 Discussion of Theme 4: Social Impacts

Automation has been transforming the way we work for decades, but recent advances in technology have made it a topic of increasing interest and concern. As machines become more intelligent and capable, they are taking over more jobs and tasks that were once performed by humans. This trend is expected to continue in the coming years, and the impact of automation on society is likely to be profound. On the one hand, automation can lead to increased efficiency, lower costs, and higher productivity. This can benefit companies, consumers, and the economy as a whole. On the other hand, automation can also lead to job displacement, wage stagnation, and growing inequality.

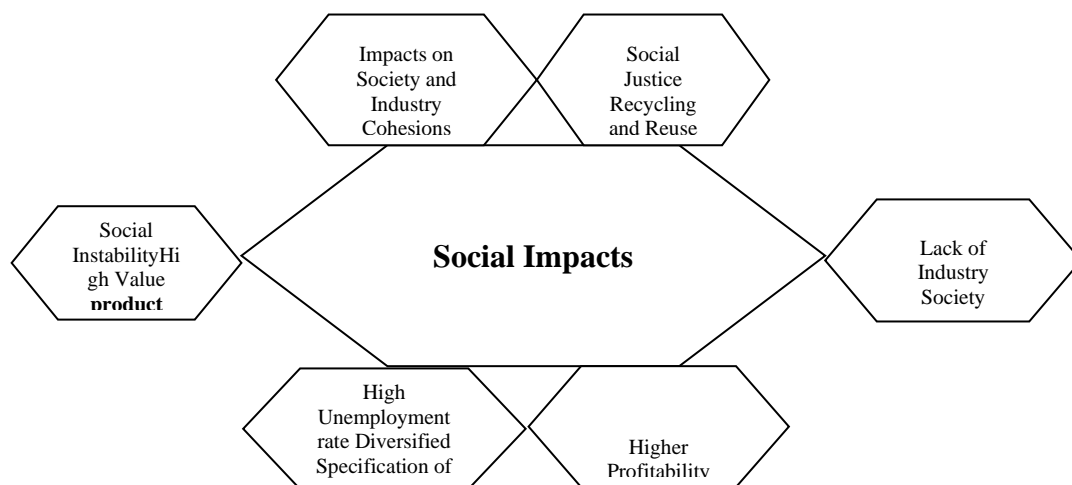


Figure 5: Developed by the Authors

To address automation, it will be important for society to take proactive steps to prepare for the future. This should involve a debate on whether such programs should be implemented at all, and if so, whether proper checks and balances are in place, such as risk, impact, appeal, and accountability procedures (Mann, 2019). This will require a combination of policies, programs, and investments to ensure that workers are equipped with the skills and knowledge needed to succeed.

WRK1 and WRK8 stated that

“The nature of work is changing due to automation, and workers will require new technology and skill training. To enable workers to adjust to evolving technologies throughout their careers, this will necessitate investments in education and training programs as well as emerging methods for lifelong learning.”

Added by FSV2

“It will be necessary for policymakers to take into account new possibilities for social support and protection. To aid workers who are displaced by automation, this could involve initiatives like income support, pay subsidies, and retraining centers. To ensure that society as a whole shares in the advantages of automation, it might also include new ways of taxation and redistributing.”

The consequences of employing robotic devices to specifically target vulnerable individuals concerning inclusion and social justice. The potential impact of community-driven campaigns and grassroots activity in drawing attention to the

implications automated systems have for people. The community must be included in assessing the social justice and human rights implications of robotic equipment employed in public spaces for public service delivery before its introduction (Mann, 2019).

WRK6 told that

"The possible effects of automation on inequality and wages. Machines might be able to carry out jobs that have already been done by higher-paid workers as they develop in capability. As a result, there may be pressure on those workers' wages to decline, and the gap between those who can operate machines and those who can't may widen."

ORM1 discussed

"We know automation displaced all levels of employees. We are trying to ensure that it promotes the well-being of everyone in society, not just the privileged few. We take some policy such as investments in education and training, new approaches to social protection"

There is no clear consensus on which ideas and practices allow industrial partners and society to develop and sustain mutually beneficial collaborations (Lucietto et al. 2021). Collaboration aids in learning about the effects of automation in society. This should include discussions on whether these sorts of programs should be adopted at all, and if so, if adequate checks and balances, such as risk, impact, appeal, and accountability systems, are put in place.

"As workplace automation grows, human employees may need to adapt to new workflows and methods of interacting with automated machinery." Furthermore, the increasing use of technology at work may change the way industry interacts with society." Statement by WRK3

Pay increases are often seen for workers who can augment new automation and do tasks that robots are not capable of doing.

LNM3 discussed that

"Workers who do comparable duties and can be replaced by machines fare badly. In general, automation moves pay away from workers and toward corporate owners, who benefit from increased profits with less labor."

Automation has the potential to completely transform the way we work and live, but it also comes with several serious hazards and difficulties that need to be

resolved. The loss of jobs is one of the main threats posed by automation. There is a chance that many jobs could be lost as machines and algorithms become more advanced and can carry out tasks that were previously done by humans (Siddiqui & Khurram, 2023)

WRK4 and WRK10 thought that

“The majority of owners desire increased productivity at lower costs. Some workers suffer as a result. Especially those who are now forced to compete with the machines after being directly replaced by them. This leads to higher lay off of employees.”

It highlights how the employment of automated technology may assist in perpetuating structural and administrative violence against the socially and economically marginalized (Barbaschow, 2019). Significant social justice challenges are linked with the explicit design of a program utilizing automated technology that targets vulnerable persons experiencing financial difficulties.

WRK5 and WRK6 stated by

“As a consequence of steadily increasing growth, automation, and control technologies, in particular, have a social influence that is so great that it alters the conventional equilibrium between technology and society and implies new behaviors from both humans and machines.”

Supported by FSV1

“Industry initiated automation for their fast production and quality accuracy. This may replace humans with machines where huge workers are deposed by the industry due to lack of advanced technology. It resulted in social unrest but the industry might not be concerned about the issues.”

4.5 Discussion of Theme 5: Ethical Imperatives

Bangladesh has long been recognized for having a large pool of inexpensive labor. Bangladesh's economy has significantly improved due to the contribution of the apparel industry. The industry has reduced the number of people living in poverty, produced a large number of jobs, and supported women's empowerment. One of the main causes of the nation's rise in female labor participation was the apparel industry. On the other side, a significant issue the nation faces is the high percentage of unskilled laborers working in the RMG industry. Because of automation, there is a growing need for skilled labor, which means that unskilled workers are losing out.

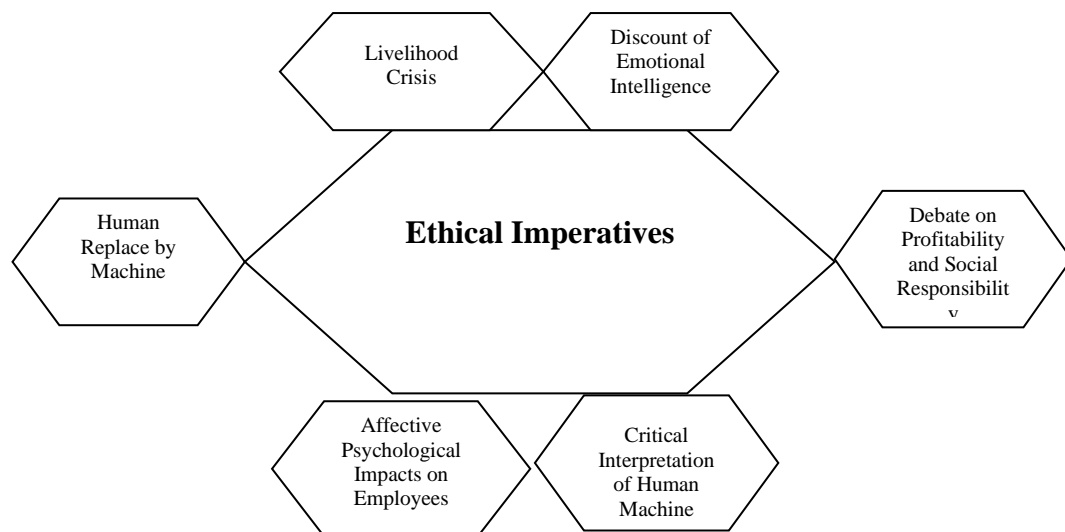


Figure 6: Developed by the Authors

Compliance in the RMG industry is a complex issue influenced by buyer demand, labor regulations, industrial laws, ILO agreements, and worker rights(Ashwin et al., 2020). In Bangladesh, the terms "compliance" and "social compliance" are often used interchangeably, but the former refers to legal frameworks, while the latter emphasizes social accountability. The application of compliance varies significantly in the Bangladeshi RMG industry, as it encompasses both high-quality garments and subcontracts sweatshops, posing unique challenges for ensuring compliance standards are met.

WRK3 stated that

“Youth unemployment and job displacement are issues brought about by automation. Political instability and societal frustration were the results.”

Evidence from LNM3

“To guarantee employment retention and help laid-off workers learn new sources of livelihoods, the industry offers training focused on improving and expanding labor market skills.”

WRK7andWRK10 discussed

“The displacement is a major consequence of automation. Even while retraining displaced workers for other occupations may have social benefits, the workers whose job has been taken over by a technological device nearly always experience a time of emotional distress”

Garment compliance difficulties are one of the most serious concerns of foreign purchasers. Typically, reputable international purchasers place orders based on four criteria: quality, price, lead time, and social compliance (Alam et al., 2017). Furthermore, these customers are taking many measures to assure safety compliance and promote supply chain transparency (integrity), including the Accord on Fire and Building Safety and Alliances for Bangladesh Workers Safety. In the context of the Bangladeshi RMG situation, potential human aspects originating from automation are part of the compliance checklist, which is viewed as a coercive force emanating from overseas purchasers.

WRK3 stated that

“Automated machinery could operate more quickly and precisely, leading to shorter production cycles and greater output levels. No doubt, this may result in larger profits for companies, which may then help employees by offering better pay and job stability.”

ORM2 argued that

“Nothing about this is assured. It's important to keep in mind that Bangladesh's apparel industry contributes significantly to employment there. Because of their ignorance of technology, many fear that automation will result in job losses in Bangladesh's garment sector. Restructuring the educational system and bridging the knowledge gap between it and industry are necessary if we are to reap all of the benefits. To guarantee job retention and help the fired employees locate other sources of income, this would necessitate investments in education and training to improve labor market abilities.”

4IR is critical for manufacturing-dependent countries that are experiencing rapid economic growth as a result of their production of various products and services. As a result, they have been investing in technology that will allow humans to be integrated for the advancement of the production level. Nonetheless, empirical study on the potential of 4IR in Bangladesh has been lacking.

WRK6 discussed that

“Automation may also lead to job creation. They said that machines require supervision and wear and tear, necessitating maintenance and repair work. In order to properly use automation, this could lead to the creation of some new jobs.”

Remarkably, a partial automation of the same industry won't end up resulting in a net loss scenario. Mondolo (202) offers an alternate perspective on automation-based job loss, arguing that when all duties of the particular job are outsourced completely, it may lead to a net decline in jobs.

WRK4 worried and said that

“Our job may be significantly affected by the introduction of automation and artificial intelligence. The majority of workers are afraid of new technologies and are tans about losing their jobs. We are worried about our job lasting. As a result, it may have an impact on our mental and physical health.”

Automated technologies accomplish a particular work more efficiently, correctly, cost-effectively, and reliably than human operators and are projected to eventually replace at least the majority of them. Automation entirely replaced the human component in certain systems, but just partially in others. However, given varying degrees of automation and value addition in industries, the concept of a clean sweep replacement of human operators is disputed (Parasuraman, 1997).

Evidence found from FSVI

“Technological implications lead to layoffs and job cuts because workers are replaced by technology and robots. They agree that automation has the potential to replace certain tasks and jobs traditionally performed.”

ORM3 and LNM2 added

“We create new jobs in the service sector and divert some of the workers to the service sector that reduces losing the job of our employees.”

5. Implication, Limitation, and Future Research Agenda

The study highlights the impacts of 4IR on the factory management of the RMG industry in Bangladesh emphasizing the potential for improved efficiency, flexibility, and customization. This transition is characterized by the adoption of digital technologies and automation to enhance productivity and quality while reducing costs. Automation in the apparel industry is leading to a reduction in the demand for traditional labor-intensive tasks. This implies a shift in the required skill set, with a growing need for skilled workers capable of operating and maintaining automated systems. Consequently, unskilled laborers may face challenges in finding employment opportunities within the industry, necessitating

strategies for retraining and upskilling to mitigate potential job losses. Automation has resulted in cost savings for apparel manufacturers in Bangladesh, leading to increased profitability. However, the study underscores the importance of considering the broader socioeconomic implications of automation, including its potential effects on income inequality and job displacement. Policymakers and industry stakeholders need to address these challenges to ensure that the benefits of automation are equitably distributed across society. The impacts of Industry 4.0 especially in the garments industry were limitedly explored before. The findings of this study will significantly contribute to the existing literature and develop the theoretical perspectives for production and factory management in the high-tech era. Therefore, it will open paradigms for many scholars, researchers, academics, and students in the field of operations management.

The study emphasizes the importance of maintaining competitiveness in the global apparel market, particularly in terms of cost, quality, and time to market. By embracing 4IR technologies, Bangladeshi manufacturers can enhance their competitiveness relative to other major players in the region, such as China and India. This underscores the need for continued investment in technological innovation and process optimization within the industry. The RMG industry has played a crucial role in Bangladesh's economic development, contributing to poverty reduction, job creation, and women's empowerment. However, the shift towards automation poses challenges for vulnerable segments of the workforce, such as unskilled laborers. Balancing the benefits of automation with the need to ensure inclusive growth and social welfare remains a critical consideration for policymakers and industry leaders. The findings of the study highlight the importance of proactive policy interventions to address the challenges and opportunities associated with automation in the apparel industry. This includes investing in education and skills development programs to prepare the workforce for the jobs of the future, as well as implementing supportive policies to facilitate the adoption of 4IR technologies while mitigating potential negative consequences for workers. Additionally, fostering collaboration between government, industry, and other stakeholders is essential to promote sustainable and inclusive growth in the sector.

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Does Good Governance Matter for FDI Inflows? Evidence from Bangladesh

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Abstract

FDI is considered as an essential factor of economic growth of a country. But, as the global FDI increases over time, competition intensifies among developing countries for attracting FDI. However, FDI of Bangladesh is very insignificant (0.913%) against its GDP during the last 22 years. So, the main purpose of the study is to find out the factors liable for our poor FDI inflow in Bangladesh. Both governance and macroeconomic variables from 2001 to 2022 were taken in the study. The study has employed an OLS method to evaluate the parameters of the model. The results found that three governance variable--control of corruption, rule of law and voice and accountability were negative on FDI inflow in Bangladesh. Among the macroeconomic variables, corporate tax rate, exchange rate and investment level of our country were found negative against FDI. In contrast, the study found wage rate, interest rate and inflation were positively related with the FDI in most models. The findings of the study thus creates a wake-up call for policy makers to give due attention to enhancing good governance environments and macroeconomic stability in Bangladesh.

1. Introduction

The importance of foreign direct investment (FDI) has increased worldwide by globalization. According to the endogenous growth theories, FDI is an important determinant of economic growth of a country. It helps to transfer technology from developed countries to developing countries (Chenaf-Nicet and Rougier 2016). A developing country is featured by low per capita income, poverty, unemployment, high population growth and low savings rates. Moreover, savings-investment gaps of these countries impact negatively on economic growth and development (Solow 1956; Koopmans 1965). FDI can come forward to fill the gap of these countries (Sabir and Khan 2018). By developing the expertise and skill of labors, the host country can also decrease unemployment and increases productivity with the help of FDI (Lipsey 2001). These countries are benefitting improved management skills and enhanced capital accumulation, exports, and thereby economic growth from FDI inflows. Therefore, the developing world has been experiencing increased amount of FDI inflow since 1990 especially in SAARC, ASEAN, Central Asian and Sub-Saharan African countries.

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However, as the global FDI increases over time, competition intensifies among developing countries for attracting FDI. Consequently, these countries are looking for diverse approaches to attract FDI inflows. They constantly try to improve their legal and policy supports to hold comprehensive FDI for long-term development (World Investment Record, 2015). As said by Asamoah et al. (2016), developing countries accepted different programs and economic partnership agreements to assist FDI inflows and keep an eye on FDI operations. However, not all of them have been performing well in attracting FDI.

1.2. Literature on the Role of Governance Institutions on FDI Inflows

A section of scholarly studies, recently, pays attention on the effect of governance factors on FDI inflows (Ali et al. 2010; Buchanan et al. 2012; Wei et al. 2000). These literatures can be divided into three segments.

1.2.1 Literature on the Impacts of Specific Governance Factors on FDI Inflows

One aspect of literature concentrates principally the impacts of a specific governance element on FDI. According to Wei (2000), corruption has negative effect on FDI. It increases the cost of doing business and uncertainty of MNCs. On the other hand, Pinto and Zhu (2013) pointed out that developed countries get more FDI because of its low levels of corruption. In contrast, high level of corruption discourages FDI to move into less developed countries.

Jensen (2003) and Ahlquist (2006) were in favor of democratic countries to catch the attention of more FDI than dictatorial countries. They further found that democratic governments have a tendency to decrease political hazards of foreign investors and also enhance the reliability of the recipient country for them. Moussa et al. (2016) and Aidt et al. (2008) found positive impact of economic freedom on FDI. On the contrary, because of cheap labor force, the domination of labor unions and other dictatorial rules, Li and Resnick (2003) reveals that democratic system in a recipient country has a negative result on FDI inflows. However, due to the weak formation of institutions, Peres et al. (2018) found an insignificant effect of institutions on FDI in developing countries when they measured governance factors by corruption and the rule of law and examined the effect of governance factors on FDI inflows in developed and developing countries.

1.2.2 Reviews on Different Dimensions of Governance Factor

In the second section of the previous studies, the study has analyzed the importance of different dimensions of governance factors on FDI inflows. Such as, Asiedu (2006) reveals that ineffective institutions like corruption, a lack of the rule of law, and political instability hinder FDI inflows. Gani (2007) found development in control of corruption (COC), political stability (PSTAB), regulatory quality (REGQ), and effectiveness of government (GEFF) have encouraging impacts on FDI inflows in South American countries. Amal et al. (2010) used a panel data model also found political stability as encouraging in South America. They further found government effectiveness as negative for FDI inflows while the other four governance variables (VAA, REGQ, ROL, COC) have insignificant coefficients. Buchanan et al. (2012) used the data of 164 countries and acknowledged that good governance factors matter to FDI. Subasat and Bellos (2013) confirm the FDI enhancement role in Latin America although poor governance existed there as the transition countries. Zeshan and Talat (2015) found positive and significant relation of VAA, PSTAB, GEFF, REGQ and COC on FDI in Pakistan by applying ARMA and OLS regression techniques.

Using random effects panel technique, Shah and Afridi (2015) found positive relation of FDI with PSTAB and REGQ and negative with COC in the selected SAARC countries. The main finding of their study is that good governance has a considerable impact on FDI inflows. Furthermore, Nguen and Cao (2015) found positive effect of governance factors on FDI inflows in Vietnam. They opined that three components of governance factors i.e. PSTAB, REGQ and COC are necessary elements of attracting FDI in Vietnam. Lucke and Eichler (2016) found a positive relationship between governance factors and FDI inflows in developing countries. They further investigated that foreign investors had a preference to invest in politically stable countries where societies were less diverged. Zidi and Ali (2016) by using the econometrics of panel data found VAA, GEFF, REGQ and the ROL positively associated with FDI in 11 countries in MENA region. However, the rest two governance variables (PSTAB and the COC) were found negative with FDI by their study.

Alternatively, impact of governance factors on FDI inflow in Sub-Saharan African countries was also studied by Nondo et al. (2016). However, their findings disagree with other studies as their study finds insignificant association between FDI and governance factors. Again, using a dynamic data of 113 developing countries, Kurul and Yalta (2017) found VAA, GEFF, COC, PSTAB and REGQ positive and significant with FDI inflows. Moreover, Gani (2007) and Ullah and Khan (2017)

found the same results from their study in Asia and Latin America, SAARC, Central Asian countries and the ASEAN region.

Findings of Wernick, Haar and Sharma (2014) also suggest the feature of the host country's governance factors is very significant factors of FDI flows to developing countries. Hossain and Rahman (2017), in the same way, stated that governance factors facilitate to enhance FDI inflow in developing countries. Likewise, Ahmad et al. (2018) found governance institutions as very important in attracting FDI in Pakistan.

1.2.3 Literature on Composite Governance Factors

The impact of composite governance index was explored in the third part of literature which is created by bringing together various components of governance indicators, such as VAA, GEFF, COC, PSTAB, REGQ and ROL. For instance, Globerman and Shapiro (2002) found the composite governance index as positive and significant on FDI inflows. Likewise, Buchanan et al. (2012) also state that composite governance index positively impacts FDI flows. However, according to Wheeler and Mody (1992), the location choices of US MNCs are not influenced by a composite governance index.

1.2.4 Other Important Determinants of FDI Inflows

Among other important determinants of FDI inflow, Shah (2017) finds trade liberalization (TRADO) and economic development as positive, whilst high inflation as negative. Additionally, a number of researches (Saleem et al. 2020; Asongu et al. 2018; Okafor et al. 2017; Rjoub et al. 2017; and Aziz and Mishra 2016) show a positive association between FDI and TRADO at the same time as a negative association was found by Mahmood (2018) in the nexus. On the other hand, some other studies (Blonigen and Piger 2014) stated that TRADO does not perform any important role in attracting FDI. Long-run cointegration between FDI and TRADO were also absent in Saleem et al. (2020) analysis.

Furthermore, regarding the effect of interest rate (IR) on FDI, studies of Mishra and Jena (2019), Mahmood (2018) and Mengistu (2011) observed a positive whether findings of Hossain (2018), Chen (2018) and de Angelo et al. (2010) found a negative impact. On the other hand, Hossain (2021) and Chandra and Handoyo (2020) found the effect of the IR as insignificant in the entire Asian region. Moreover, according to Suhendra and Istikomah (2022), the decision to invest is depend on the amount of returns including IR. Ajija and Fanani (2021) pointed out a negative effect of IR on FDI inflow as when interest rate increases, the FDI inflow reduces.

Furthermore, a positive relationship was observed between GDP growth and FDI by the researches of Hossain (2021), Kurtović et al. (2020), Saleem et al. (2020) and Jaiblai and Shenai (2019). Therefore, GDPGR is recognized as an important element of FDI at present. However, the relationship between GDPGR and FDI is not discovered so far in Bangladesh.

Inflation is also a key factor of inward FDI. The study on the relationship between FDI and inflation rate has experienced diverse results also. For instance, research works of Agudze and Ibhagui (2021), Sabir et al. 2019), Rashid et al. (2017), Boateng et al. (2015), Ibrahim and Abdel-Gadir (2015) found a negative association and some other like (Bano et al. 2019; Boateng et al. 2017) exposed a positive association. Few other studies like Cavusoglu and Alsabr (2017) and Ceviş and Camurdan (2007) noted the persistence of a noteworthy association between FDI and inflation rate. Nevertheless, the nature of the associations was not verified by these studies.

Furthermore, about the impact of the corporate tax rate (CTR) on FDI, the largest part of the intellectual efforts (Nazir et al. 2020; Andersen et al. 2017; Du et al. 2014; Tang et al. 2014) revealed that CTR hinders the FDI inflow in recipient countries. A considerable number of studies (Alam and Quazi 2003; Mahbub and Jongwanich 2019) on the FDI–CTR nexus also showed a negative association in Bangladesh. In contrast, there are a number of contradictory outcomes too. For instance, among the OECD nations, Jones and Temouri (2016) foundd very nominal effect of the CTR on FDI and others (Kinda 2018; Hunady and Orviska 2014) found no impact in any way.

Besides, it is also seen that currency devaluation helps to get additional FDI to the recipient country (Mostafa 2020; Xing 2006). Mostafa (2020) and Qamruzzaman et al. (2019) revealed that acceleration of EXG reduces FDI inflow in Bangladesh. Therefore, the study has investigated the result of the EXG on fund flow in Bangladesh. Additionally, study in the FDI–wage rate nexus (Economou 2019; Blanc-Brude et al. 2014; Hunady and Orviska 2014; Bilgili et al. 2012) have typically argued that low WR invites further FDI and convinces the foreign firms to rally their manufacture units where the WR is cheap.

1.2.5 Literature Gap

The above discussion reflects that there is inconsistency on results in the previous researches. The findings of earlier researches no doubt demonstrate the contradiction and indecisiveness. Moreover, not many pragmatic researches have studied the association linking the governance indicators and FDI in Bangladesh. Again, ahead of concentrating just on one of the governance indicators as many the

previous researchers carried out (Wei 2000; Jensen 2003; Ahlquist 2006), the study analyzes the effects of varied factors of governance factors individually as well as collectively and with an composite index in order to identify whether governance quality affects the FDI. Carrying out such a move also approves us to suggest diverse policy recommendations about the level of governance required at the institution in Bangladesh.

Third, to avoid specification bias, the article studies the impact of governance indicators and FDI inflow by other key macroeconomic indicators for instance GDP growth, corporate tax rate, domestic investment, exchange rate, inflation, interest rate, trade openness, wage rate etc. Moreover, very few researches were carried out to evaluate the whole impact of all these indicators on FDI inflow. Thus, the present study is committed to satisfying the aforesaid research gap in the presented literature through an extensive study by finding out the impact of these indicators on FDI in Bangladesh.

Moreover, not too many researchers studied the relationship between FDI and GDPGR in Bangladesh (Hossain 2021; Hussain and Haque 2016; Sarker and Khan 2020). Hence, the research gap is clear. Likewise, very few studies highlighting Bangladesh that talked with the relationship between FDI and EXG. Furthermore, the association between FDI and INF has not been studied in the aforesaid researches, and very few studies have been carried out in the circumstance of Bangladesh. Also, in spite of everything, debate is still there about the effect of RIR on FDI. The relationship between FDI and TRADO also has not been determined comprehensively in the circumstance of Bangladesh. Regarding wage rate, not so many researchers (Sadekin et al. 2015; Nasrin et al. 2010) have found WR as a significant factor of FDI inflow in Bangladesh although the dataset of these researches is small.

Therefore, it is evident from the above conversation that not so many studies highlighting on governance factors and other determinants on FDI inflow in Bangladesh. Moreover, reviewed literatures regarding the FDI provide full of inconsistent results. Hence, the results of this research work will support to assess the governance as well as macroeconomic factors in the context of Bangladesh from a diverse point of view.

2 Statement of the Problem

As said by IMF's BOPs database, net FDI inflow from 2010 to 2019 into Bangladesh amounted to \$20.5 billion only. However, during the same time, Myanmar received net FDI inflows of \$24.8 billion, Philippines \$58.6 billion,

Malaysia \$106.9 billion, Indonesia \$194.2 billion and India \$371.8 billion. Therefore, first research question of this project is: why FDI inflow of Bangladesh is so poor.

To get the answer of this question Bangladesh needs to identify what foreign investors look forward to from the host country. As said by Fedderke and Romm (2006), foreign investors when enter the foreign markets are more concerned about their risk and return. Global investors frequently retrieve business and economic data for 200 countries provided by TheGlobalEconomy.com ahead of taking investment decision.

‘The eclectic paradigm theory’ of Dunning (1988) proposed that a foreign investor opinion to invest in a recipient country relies on many issues such as the market size, admin and managing systems, labor and transportation costs, administration policies, in addition to governance and political strength. However, consistent with OECD, foreign investors concentrate mainly to the governance framework of a country in which they are going to invest (OECD 2012). On the other hand, North’s ‘institutional theory’ (1990) says that economic activities are affected by good institutions. Furthermore, profitability increases and the ‘cost of doing business’ is reduced by the high-quality institutions. Moreover, investors are indecisive to move in a country where institutions promote corruption, discrimination and formalities (Mengistu and Adhikary 2011). According to Lucas (1993), governance factors perform an important role as compared to economic factors in receiving inward FDI in emerging economies.

Foreign investors prefer to move in countries where effective elected structures exist (Harms and Ursprung, 2002). However, while investing, the MNCs give attention to the economic globalization, site determinants, infrastructural maturity, political atmosphere and useful cross-border trade rules in addition to governance factors of the host economies (Contractor et al. 2020; Kleineick et al. 2020; Alam et al. 2019; Paul and Jadhav 2019; Deseatnicov and Akiba 2016). Despite the above factors, several additional country-specific factors of FDI are also regarded as important factors of FDI inflow for several developing countries. Those are COC, ROL, and VAA (Osabutey and Okoro 2015).

FDI inflow can also been affected by a country’s social, political and governance features. Socio-political and political-governance varieties of researches (Ibrahim et al. 2020; Kurtović et al. 2020; Paul and Jadhav 2019; Mourao 2018; Rashid et al. 2017) have recognized the most important factors of FDI of world’s promising nations. Those are PSTAB, GEFF, REGQ, VAA, active start-up regulations, economic liberty, ease of doing business, government expenditure, improved one-

stop services dedicated for global trade etc. Several other researchers have found INF, EXG, RIR, and GDPGR, per capita GDP, TRADO, gross national income and external debt as macroeconomic factors of FDI (Hossain 2021; Asiamah et al. 2019; Sabir et al. 2019; Jaiblai and Shenai 2019; Kishor and Singh 2015). Therefore, the current study tries to determine both the governance and macro factors responsible for our insignificant inflow of FDI in Bangladesh.

3. Objectives of the Study

The major objective of the research is to identify the causes liable for our poor inflow of FDI in Bangladesh. However, the specific objectives are as follows:

- (i) to observe the association between governance factors and FDI inflows.
- (ii) to examine the association between macroeconomic factors and FDI inflows.

4. Methodology of the Study

The research work is quantitative in character and provides explanatory synopsis of variables of importance. It's also descriptive study since it evaluates the effect of both governance and macroeconomic factors on FDI in Bangladesh.

Table-1: Description of Variables used in the Study

Variable name	Notation	Description
Dependent Variable		
Foreign Direct Investment	FDI	FDI as a percentage of GDP
Independent Variables		
Governance Variables		
Control of Corruption	COC	Summarizes opinions of the degree to which civic rule is worked out for individual gain
Political Stability	PSTAB	Assesses opinions of the probability of political unpredictability
Rule of Law	ROL	Summarizes opinions of the degree to which representatives have faith in and abide by the set of laws of the people
Regulatory Quality	REGQ	Summarizes opinions of the government's capacity to prepare and execute sound strategies and schemes
Voice and Accountability	VAA	Summarizes opinions of the degree to which a nation's

Variable name	Notation	Description
Dependent Variable		
		citizens are capable to take part in choosing their government, as well as autonomy of expression, autonomy of union, and a liberated media
Government Effectiveness	GEFF	Summarizes opinions of the quality of the community and public services and the level of its autonomy
Macroeconomic Variables		
Corporate tax rate	CTR	Corporate tax rate of Bangladesh
Exchange rate	EXG	The average buying and selling of Bangladeshi Taka to US dollar
GDP growth rate	GDPGR	Annual GDP growth rate in percentage form
Inflation rate	INF	Consumer Price index (CPI)
Investment	INV	Gross fixed capital formation as percentage of GDP
Real Interest rate	RIR	Lending Interest Rate
Trade Openness	TRADO	The proportion of trade which is the summation of exports and imports to GDP
Wage rate	WR	An estimation of total income after taxes divided by the total number of employees employed

Source: Compiled by authors

4.1 Sources of Data

The research work has employed 22 years series data of Bangladesh from 2001 to 2022. The major sources of data were the World Governance Indicators (WGI) and the World Development Indicators (WDI). The study has collected data on the governance factors i.e., COC, VAA, GEFF, PSTAB, ROL, and REGQ from the WGI. On the other hand, data on EXG, GDPGR, INF, RIR, and TRADO were obtained from the WDI. Bangladesh Bureau of Statistics (BBS) provides WR data while the CTR were obtained from the National Board of Revenue (NBR).

4.2 Hypothesis Development

Based on related theory and previous literature, the study has developed the following hypotheses:

H₁: Governance factors and the FDI inflows of Bangladesh are positively correlated.

H₂: Macroeconomic factors and the FDI inflows of Bangladesh are positively correlated.

4.3 Analysis of the Study

This study has employed Ordinary Least Square (OLS) method to evaluate the variables of the model. The multiple regression model was applied by the study to find out the correlation between governance and macroeconomic variables and the FDI inflow. Before receiving findings from the OLS, the model was tested whether it can be employed to forecast the findings or whether the OLS model is best or not. To test the validity and reliability of the research findings the study has used Jacque-Bera test (to test the normality), Durbin-Watson test and Breusch-Godfrey LM test (to test the problem of autocorrelation), Breusch-Pagan test (to verify the heteroscedasticity) and finally CUSUM Test (to check the stability in the regression model).

4.4 Econometric Model of the Study

According to Dunning's eclectic paradigm theory and North's governance theory, FDI inflow relies on the host country's market size, macroeconomic stability and the governance factors. Algebraically the relationship can be written as:

FDI = f (market size, macroeconomic stability, governance factors)

Based on theoretical background, the study has used an empirical model below to evaluate the effect of governance factors on FDI inflow:

$$Y_t = \alpha + \beta X_t + \gamma Z_t + U_t$$

where Y_t is the log of FDI inflows, X_t are vectors of the governance quality of Bangladesh during period $t = (1, 2, 3, \dots)$, Z_t are the vectors of macroeconomic factors for example CTR, EXG, INF, INV, RIR, TRADO, GDPGR, and WR during period $t = (1, 2, 3, \dots)$, and U_t is the error term. Since the governance variables are highly correlated with one another, therefore, instead of taking all of them in a single equation the study has constructed a composite governance index of institutions by taking the simple average of six governance variables (Globerman and Shapiro 2002). The study has used EViews 10 software for data analysis and result interpretation.

5. Descriptive Statistics of Dependent and Independent Variables

Table-1 has described the descriptive statistics of FDI inflow, governance and macroeconomic indicators those were employed in this analysis. The table has displayed means, maximums, minimums, and standard deviations of the variables for the period from 2001 to 2022.

Table-1: Descriptive Statistics of Dependent, Independent and other Control Variables

Variable	Min	Max	Mean	Standard Deviation
Dependent Variable				
FDI	0.10	1.74	0.91	0.42
Independent Variable				
Governance Indicators				
COC	-1.5	-0.81	-1.08	0.23
GEFF	-0.91	-0.68	-0.68	0.34
PSTAB	-1.86	-0.72	-1.28	0.29
REGQ	-1.05	-0.57	-0.81	0.14
ROL	-1.13	-0.8	-0.92	0.09
VAA	-0.77	-0.23	-0.5	0.16
Macroeconomic Variable				
CTR	25.00	35.00	28.25	2.70
GDPGR	3.51	8.15	6.15	1.12
EXG	55.81	98.85	71.95	9.22
INF	2.00	9.94	6.39	2.03
INV	24.10	32.21	27.62	2.68
RIR	3.10	9.30	5.44	1.28
TRADO	36.03	48.11	26.00	7.25
WR	7.82	9.51	8.68	0.56

Source: Authors estimation.

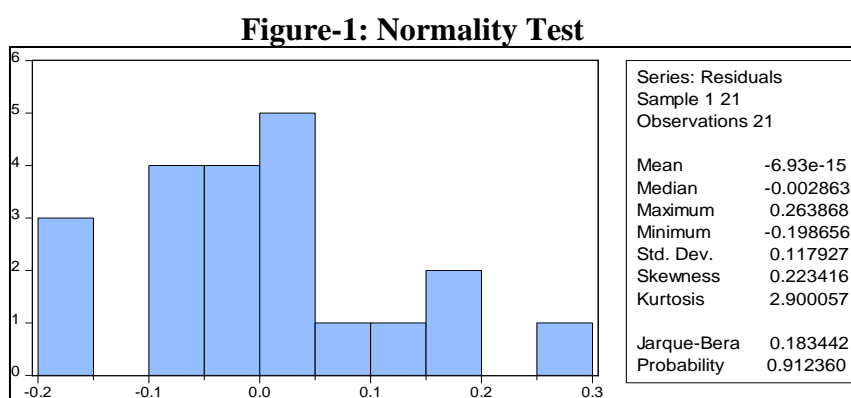
From Table-1, it is further seen that FDI of Bangladesh was very insignificant (0.913%) against its GDP during the study period. The values of all governance factors found negative meaning that our institutions are not performing well. Among the governance factors of Bangladesh, PSTAB has the highest negative mean value (-1.28), followed by COC, ROL, REGQ and GEFF. Meanwhile, important economic factors like CTR, EXG, INV, GDPGR, INF, RIR, TRADO and WR has been used as the control variable in this study.

5.1 Diagnostic Test

Before running the OLS, the study has performed several diagnostic tests on the residuals to examine the validity and reliability of the estimated model. This includes normality test, autocorrelation test, heteroscedasticity test and stability test. The outcomes of these issues are presented below in the following tables.

5.1.1 Normality Test

The research article has used the Jarque-Bera test to examine the normality of distribution in Figure-1. According to the test, it is observed that the result of Skewness (0.223416) and Kurtosis (2.900057) satisfies the condition of normal distribution. Again, it is seen that the Jarque-Bera value (0.183442) and the p-value (0.912360) of this distribution is greater than 0.05. These results suggest that the residuals of the model follow the normal distribution. Therefore, the study cannot reject null hypothesis of the normal distribution.



Source: Derived by the authors from E-views software

5.1.2 Test of Autocorrelation

With the aim to investigate whether the error terms in the regression model are independently and identically distributed, the study has carried out Durbin-Watson test and Breusch-Godfrey Serial Correlation LM tests.

5.1.3.1 Durbin-Watson test

The Durbin-Watson test was employed to assess whether there is autocorrelation problem in the model in addition to recognize which group the problem fits in. Durbin-Watson test statistics of Table-2 to Table-7 found an acceptable range between 1.46 and 2.33 which are more than their R-squared values. Based on these results, it can be said that the problem of autocorrelation does not exist in these models.

5.1.3.2 Breusch-Godfrey Serial Correlation LM test

The study has employed 'Breusch-Godfrey Serial Correlation LM Test' to find there is any serial correlation in the residuals. The findings of this test in Table-2

show that the p-value of the F-statistics (0.8973) is greater than 0.05. So, the null hypothesis is accepted at 5% level of significance and it can be assumed that correlation problems do not exist in the model.

Table-2: Breusch-Godfrey Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.10951	Prob. F(2,10)	0.8973
Obs*R-squared	0.450084	Prob. Chi-Square(2)	0.7985

Source: Derived by the authors from E-views software

5.1.4 Heteroscedasticity Test Results

The study has verified the heteroskedasticity by applying the Breusch-Pagan-Godfrey for White Heteroskedasticity test in Table-3.

Table-3: Heteroskedasticity Test: Breusch-Pagan-Godfrey

H ₀ : There is no heteroscedascity			
F-statistic	1.745454	Prob. F(8,12)	0.1853
Obs*R-squared	11.29412	Prob. Chi-Square(8)	0.1856
Scaled explained SS	3.579343	Prob. Chi-Square(8)	0.8929

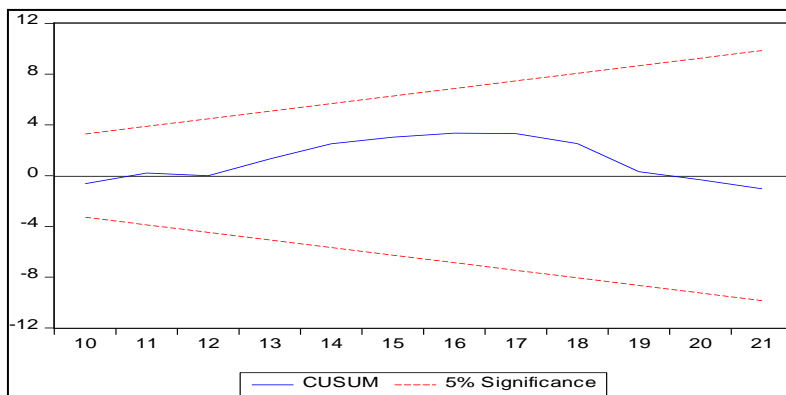
Source: Derived by the authors from E-views software

From the test, it is found that the p-value (0.1853) is greater than 0.05% which indicates that the model cannot reject the null hypothesis in the residuals. So, it is suggested that the errors in the residuals are homoscedastic.

5.1.5 CUSUM test

To assess the stability of the coefficients and the model's structural stability, the study has employed the CUSUM test as seen in the Figure-2. Throughout the examination, the CUSUM values stayed within the allowed range of +/- 5%, as seen in the graphs indicating that all parameters and coefficients derived from the regression are stable. The results of the test mean that the coefficients in the data are stable. Therefore, since the estimated model looks to follow a steady relationship throughout the assessment period, this model can be exercised for policy decision-making purposes in Bangladesh.

Figure-2: CUSUM Test



Source: Derived by the authors from E-views software

The above diagnostic tests results show that the model displays pleasing econometric properties, residuals are normally distributed, serially uncorrelated, homoscedastic and follow a stable pattern. Therefore, it can be said that the results are reliable and can be applied to generate significant explanations. Thus, the explanatory variables are the basic determinants of FDI inflow of Bangladesh. This of course enhanced the reliability of regression analysis.

5.2 Impact of Governance Factors on FDI Inflow

At the stage, to see the impact of the governance factors on FDI inflow to Bangladesh the study has used the regression analysis. OLS technique was used to test the effectiveness and impact of the COC, GEFF, PTSAB, REGQ, ROL and VAA on the FDI inflow. The findings of OLS are described in the following sections.

5.2.1 Impact of Control of Corruption on FDI

It is noticed in Table-2 that the impact of control of corruption on FDI is negative and statistically significant. That means Bangladesh is not making any effort to decrease the level of corruption and ultimately fails to get FDI. This result were supported by Zidi and Ali (2016) and Shah and Afridi (2015) who earlier found the COC as a negative and significant factor on FDI. It is further seen that CTR, EXG, INF, RIR, TRADO and WR were the significant economic factors that attract FDI in Bangladesh. However, the CTR and EXG negatively affect FDI.

Table-4: Impact of Control of Corruption on FDI

Dependent Variable: FDI				
Method: Least Squares				
Included observations: 21 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-7.54	4.09	-1.84	0.09
COC	-1.59	0.73	-2.18	0.05*
CTR	-0.08	0.03	-2.80	0.02**
EXG	-0.10	0.04	-2.60	0.02**
GDPGR	0.08	0.07	1.15	0.28
INF	0.11	0.05	2.31	0.04**
INV	-0.22	0.14	-1.62	0.13
WR	0.13	0.05	2.62	0.02**
RIR	0.16	0.06	2.53	0.03**
TRADO	0.07	0.03	2.65	0.02**
R-squared	0.85	Adjusted R-squared		0.73
F-statistic	6.90	Durbin-Watson stat		1.46
Prob(F-statistic)	0.00			

Note: *Significance at 10%, **Significance at 5%, ***Significance at 1%.

Source: Authors estimation.

5.2.2 Impact of Government Efficiency on FDI

In Table-5, government effectiveness also shows a negative impact on FDI inflow in Bangladesh. However, the result is not significant. However, the result is inconsistent with Kurul and Yalta, (2017), Zidi and Ali (2016), Amal et al. (2010) and Zeshan and Talat (2015). Among the economic factors, EXG, GDPGR, INV and TRADO found insignificant in this analysis.

Table-5: Impact of Government Efficiency on FDI

Dependent Variable: FDI				
Method: Least Squares				
Included observations: 21 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.89	2.37	0.37	0.72
GEFF	-0.20	0.22	-0.93	0.37
CTR	-0.08	0.03	-2.57	0.03**
EXG	-0.04	0.03	-1.27	0.23
GDPGR	0.08	0.08	1.04	0.32
INF	0.34	0.79	1.70	0.12
INV	-0.24	0.17	-1.38	0.20
WR	0.12	0.06	1.96	0.08*
RIR	0.14	0.07	1.90	0.08*
TRADO	0.02	0.02	0.91	0.38
R-squared	0.80	Adjusted R-squared		0.64
F-statistic	4.90	Durbin-Watson stat		1.47
Prob (F-statistic)	0.00			

Note: *Significance at 10%, **Significance at 5%, ***Significance at 1%.

Source: Authors estimation.

5.2.3 Impact of Political Stability on FDI

In Table-6, political stability, another governance variable is also found negative with FDI. And this result is also statistically insignificant. The result is supported by Amal et al. (2010). This result does not confirm empirically studies by Kurul and Yalta (2017), Zeshan and Talat (2015) and Shah and Afridi (2015) who found positive impact of political stability in the attraction of FDI. Among other economic factors, CTR again provide negative results for FDI inflows in Bangladesh. However, WR, and RIR found positive and significant results for FDI inflows.

Table-6: Impact of Political Stability on FDI

Dependent Variable: FDI				
Method: Least Squares				
Included observations: 21 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.02	2.81	-0.72	0.49
PSTAB	-0.44	0.34	-1.31	0.22
CTR	-0.07	0.03	-2.09	0.06*
EXG	-0.05	0.03	-1.44	0.18
GDPGR	0.06	0.08	0.84	0.42
INF	0.46	0.77	1.89	0.09*
INV	-0.19	0.15	-1.27	0.23
WR	0.10	0.05	1.88	0.09*
RIR	0.19	0.08	2.26	0.04**
TRADO	0.02	0.02	1.08	0.30
R-squared	0.81	Adjusted R-squared		0.66
F-statistic	5.33	Durbin-Watson stat		1.88
Prob (F-statistic)	0.00			

Note: *Significance at 10%, **Significance at 5%, ***Significance at 1%.

Source: Authors estimation.

5.2.4 Impact of Regulation Quality on FDI

According to Table-7, regulatory quality has a negative impact on FDI inflows. However, the result is not significant.

Table-7: Impact of Regulation Quality on FDI

Dependent Variable: FDI				
Method: Least Squares				
Included observations: 21 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.94	2.55	-0.76	0.46
REGQ	-1.59	1.01	-1.58	0.14
CTR	-0.08	0.03	-2.72	0.02**
EXG	-0.06	0.03	-1.74	0.11
GDPGR	0.11	0.08	1.39	0.19
INV	-0.31	0.17	-1.81	0.10

Dependent Variable: FDI				
Method: Least Squares				
Included observations: 21 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF	0.91	0.86	2.22	0.05*
WR	0.14	0.06	2.37	0.04**
RIR	0.16	0.07	2.33	0.04**
TRADO	0.02	0.02	1.17	0.27
R-squared	0.82	Adjusted R-squared		0.68
F-statistic	5.74	Durbin-Watson stat		1.90
Prob(F-statistic)	0.00			

Note: *Significance at 10%, **Significance at 5%, ***Significance at 1%.

Source: Authors estimation.

This result supports the study of Amal et al. (2010). But does not support our theoretical hypothesis (Kurul and Yalta, 2017; Zidi and Ali, 2016; Zeshan and Talat, 2015; Shah and Afridi, 2015). Among other economic variables, CTR again shows negative impact on FDI. In contrast, INF, WR and RIR have positive and significant impact on FDI.

5.2.5 Impact of Rule of Law on FDI

The study finds the ROL has a negative impact on FDI inflows in Table-6 and it is significant. Therefore, it is proved that systems of rules are not executed in Bangladesh. Institutions do not work and do not maintain a favorable implementation of these rules. As a result, FDI inflows discouraged to come into Bangladesh. This result is supported by Buchanan et al. (2012) but inconsistent to the results of Zidi and Ali (2016) who found positive impact of ROL on FDI. We further note that apart from the variable of GDPGR and TRADO most other control variables are statistically significant. On the other hand, CTR, EXG, and INV found significant but negative with FDI. On the other hand, INF, WR, and RIR are significant and positively correlated to FDI.

Table-6: Impact of Rule of Law on FDI

Dependent Variable: FDI				
Method: Least Squares				
Included observations: 21 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.29	2.60	-1.65	0.13
ROL	-2.23	0.88	-2.54	0.03**
CTR	-0.07	0.03	-2.40	0.04**
EXG	-0.06	0.03	-1.89	0.09*
GDPGR	0.07	0.07	1.10	0.30
INV	-0.27	0.14	-1.93	0.08*
INF	0.14	0.77	0.65	0.02**
WR	0.14	0.05	2.86	0.02**
RIR	0.13	0.06	2.00	0.07*
TRADO	0.02	0.02	1.24	0.24
R-squared	0.85	Adjusted R-squared		0.72
F-statistic	6.30	Durbin-Watson stat		2.33
Prob(F-statistic)	0.00			

Note: *Significance at 10%, **Significance at 5%, ***Significance at 1%.

Source: Authors estimation.

5.2.6 Impact of Voice and Accountability on FDI

Table-7 shows that VAA has a negative and statistically significant impact on FDI. This indicates that the lack of accountability and lack of democratic system discourages FDI inflows in Bangladesh. The result opposes the findings of Kurul and Yalta (2017), Zidi and Ali (2016) and Zeshan and Talat (2015) but supports the findings of Buchanan et al. (2012). Among the control variables, CTR and INV are significantly but negatively related with FDI. In contrast, INF, WR, RIR and TRADO are positively and significantly correlated to FDI inflow in Bangladesh.

Table-7: Impact of Voice and Accountability on FDI

Dependent Variable: FDI				
Method: Least Squares				
Included observations: 21 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.48	1.92	0.25	0.81
VAA	-1.83	0.77	-2.40	0.04**
CTR	-0.10	0.03	-3.55	0.00***
EXG	-0.04	0.03	-1.45	0.18
GDPGR	0.11	0.07	1.66	0.12
INV	-0.47	0.18	-2.59	0.03**
INF	0.09	0.75	2.79	0.02**
WR	0.12	0.05	2.63	0.02**
RIR	0.25	0.08	3.18	0.01**
TRADO	0.03	0.02	1.85	0.09*
R-squared	0.86	Adjusted R-squared		0.74
F-statistic	7.41	Durbin-Watson stat		1.67
Prob(F-statistic)	0.00			

Note: *Significance at 10%, **Significance at 5%, ***Significance at 1%.

Source: Authors estimation.

5.3 Major Findings of the Study

The results of the above models found GEFF, REGQ and PSTAB are negative but not significant factors for FDI inflows in Bangladesh. However, the other three governance variable--COC, ROL and VAA were found negative and significant on FDI inflow in Bangladesh. These findings were supported by Zidi and Ali (2016) and Shah and Afridi (2015) Buchanan et al. (2012). The results reveal that corruption practices, the undue pressure on bureaucracy, vulnerable political system, lack of transparency and accountability of the politicians cause a decrease in FDI inflows. It also discourages the MNCs to bring fund into Bangladesh. The results further indicates that constitutional rights and human rights of the people like autonomy of protest and channel, capacity to execute policies and rules by the administration encourage the FDI inflow. On the other hand, taking advantage of civil authority to make personal benefit prevent the foreign investor to provide funds into Bangladesh. The negative results of the governance indicators mean that bad governance cause to deter FDI inflow to Bangladesh. This is a symptom of an

immature political environment in Bangladesh which does not attract foreign investors to come here.

Among the macroeconomic variables, CTR, WR and RIR found significant in all six models. Of them, WR and RIR were positively correlated with the FDI inflow. The outcomes of the models are similar to the studies of Mishra and Jena (2019), Economou (2019), Mahmood (2018), Blanc-Brude et al. (2014), Hunady and Orviska (2014), Bilgili et al. (2012) and Mengistu (2011). In contrast, correlation between CTR and FDI inflow was negative. The result supports the works of Nazir et al. (2020), Andersen et al. (2017), Du et al. (2014), and Tang et al. (2014). But, GDPGR was found insignificant in all the models. The results, however, are not backed by the findings of Hossain (2021), Kurtović et al. (2020), Saleem et al. (2020) and Jaiblai and Shenai (2019).

5.3 Evaluating Regression Equation

All the tables above specify that this is a good-fit of regression equation as the R^2 and the adjusted R^2 values were greater than 80%. The values denote that the variations in the independent variables can describe about 80% of the dependent variable. The F-statistics of the model give us an idea it is significant at 1% level as well. The findings of the diagnostic tests also point out that the model exhibits desirable econometric properties. Thus, the explanatory variables are the basic determinants of FDI inflow of Bangladesh.

6. Policy Implications

The above findings guide us to make a conclusion that if a country is incapable to control of corruption, has inefficient administration, non-transparent government policies, has irresponsible civil service, non-reliable and non-participatory political system should initiate to change their governance policies and preparations to get more FDI inflows. The findings of the study thus make a get up call for policy makers of Bangladesh. They should focus to develop attractive good governance environments particularly get better law and order situation. For receiving the FDI, Bangladesh needs to develop an efficient, neutral and transparent legal system. Qualified civil and public services and control of institutional corruptions are also presently vital for our country. Improving governance indicators for a good investment atmosphere should be a significant instruction for developing policy in Bangladesh. Hence, developing the governance quality should be regarded as a vital issue for a favorable investment environment that improves the trust of the foreign investors, and could be a noteworthy instruction for policymakers in Bangladesh. Alongside, for expediting FDI inflows in Bangladesh, a sound physical infrastructure, steady and projected macroeconomic strategies, high GDP

growth rates over the previous years, sound trade policies, national capital formation and inexpensive labor are of maximum significance. Bangladesh should pay out more on human capital, increase household investment, uphold macroeconomic solidity and support trade openness for getting more FDI inflow. This can further generate a vibrant spillover outcome in the economy what we observed earlier in East and Southeastern Asia. In conclusion, policymakers should take into account that the ongoing matter is not whether the policy situation is by and large dominant or liberal but whether policies are accurately planned to deal with the necessary demands of FDI attraction and as a consequence economic growth in general.

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Role of Bangladesh Small and Cottage Industries Corporation in Entrepreneurial Development: A Case of Selected Districts in Northern Zone of Bangladesh

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Abstract

The aim of this research is to evaluate the roles of Bangladesh Small and Cottage Industries Corporation (BSCIC) in developing entrepreneurial class in the northern zone of Bangladesh in terms of its various supporting services based on institutional and stakeholder theories. This study adopts a sequential explorative mixed-methods approach to attain its objectives using pragmatism research paradigm. In the qualitative phase of this mixed method, a conceptual model is developed based on the 19 in-depth interviews and then in the quantitative phase surveyed on 243 entrepreneurs regarding the role of BSCIC in entrepreneurial development using structured questionnaire. The study finds that the perceptions of the entrepreneurs regarding the support services relating to the infrastructural facilities, credit arrangement, pre-investment counseling, and primary training support services provided by BSCIC for entrepreneurship development at the initialization stage are negative. The support services by the BSCIC at the growth stage such as Skill Development Training, Market information, Customer related information, supportive Behavior and Upholding creativity perceived significantly positive by the entrepreneurs. This study also finds the perception of entrepreneurs are significant towards support services such as motivation, promoting innovation, promoting change and providing training on technological application provided by the BSCIC at the sustenance stage. This study also developed a moderating impact of entrepreneurs' background characteristics such as experience and years of involvement with BSCIC between support services at initialization stage, growth stage, and sustenance stage and entrepreneurship development where the moderating impact of entrepreneurs' background characteristics between support services at initialization stage on entrepreneurship development is significant. The outcome of the study regarding the role of the BSCIC would help policymakers to make proper policies for the upliftment of entrepreneurship. Additionally, this research will advance our theoretical understanding of the growth of entrepreneurship.

Key words: BSCIC, Entrepreneurship Development, Northern Zone, Bangladesh, Mixed-Methods

JEL Classification: L26

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1. Introduction

Bangladesh Small and Cottage Industries Corporation (BSCIC) have been carrying out the responsibilities for advancement and growth of Small and Cottage Industries (SCIs) in Bangladesh since its establishment in 1957 by an Act of Parliament (Hossain *et al.*, 2018). BSCIC through its institutional network and implementation of its different projects has been providing its package of support services to the private sector entrepreneurs (Bari, Obayed, & Tahmida, 2019). The underlying forces behind the SCIs are the entrepreneurs who are playing pivotal role in helping Gross Domestic Product (GDP) to grow. Entrepreneurs are among the essential components of an economy that propels the economic development of a country (Stoica, Roman, & Rusu, 2020). Entrepreneurs are nurtured to grow and emerge, not born (López-Núñez *et al.*, 2020). A good number of institutions are taking various initiatives to develop an entrepreneurial class in Bangladesh. Of them BSCIC is playing a leading role in the development of an entrepreneurial class. BSCIC stands as the prime mover organization for the development of SCIs of the country.

In order to facilitate the expansion of SCIs in an equitable manner, BSCIC has been providing a range of assistance to small businesses through its four regional offices (Dhaka, Chittagong, Rajshahi, and Khulna) and 74 manufacturing parks nationwide. Additionally, it is currently building in a number of estates, including some specifically designed for Tannery, API (Active Pharmaceutical Ingredients), Garments Park, and other uses. Moreover, there are 183 upazilla centers under a variety of projects like entrepreneurship development program, poverty alleviation through income generating activities, and growth of rural enterprises to stimulate the rural economy (Islam, 2020).

BSCIC, one of the leading corporations vested with this responsibility in Bangladesh, has initiated so far various programs for the upliftment of entrepreneurs in SCIs. Both agricultural and industrial sectors have been contributing to the nation's economic progress. The contribution of industrial sector is more than that of the agricultural sector. Within industrial sector, along with large industry, cottage, micro, small and medium industries are also playing significant roles. Various organizations dealing with cottage, micro, SCIs are positively contributing to the economy as well as to enhancing the society. Among them, BSCIC has been playing an important role with view to developing entrepreneurs resulting in alleviating poverty of the society. The Northern Zone of Bangladesh is industrially least developed. Despite the role of BSCIC providing support services in initializing, growing, and sustaining entrepreneur activity in the zone under study is not supposedly equivalent to that it plays in the other regions or parts.

Despite the glorious past of it, BSCIC in contributing to the economy of the country it has failed to demonstrate its expected vigor in satisfying the emerging demand and needs of the entrepreneurs to cater to the changing scenario of the global trend. The reasons for the failure should be identified and evaluated. A meager number of studies were conducted to investigate the position of BSCIC in entrepreneurial development in Bangladesh, particularly, in northern zone, which should have received substantial scholarly attention.

However, the literature relating to entrepreneurship development in the region in question are devoid of the studies manifesting the role of BSCIC in entrepreneurship development has obviously left a gap that must be filled up through proper investigation. As BSCIC is meant for providing support services for the generation, growth and sustenance of entrepreneurial class in Bangladesh it is imperative to know how entrepreneurs perceive these services provided by it. This study's primary goal is to evaluate the role of BSCIC in developing entrepreneurial class in the Northern Zone of Bangladesh in terms of its various supporting services based on institutional and stakeholder theories. The particular goals are to investigate the support services provided by BSCIC at the initialization, growth, and sustenance stage of entrepreneurship development in the Northern region of Bangladesh and to have an idea about the dispositions and attitudes of the entrepreneurs towards the support services provided to them by the said institution in the region under study.

2. Literature Review

Entrepreneurship involves the individual who undertakes several endeavors (Dollinger, 2008). An entrepreneur is a combination of personality traits (Gartner, 1988). The persons who engage with taking economic venture and business decisions are recognized as entrepreneurs. Entrepreneurship development implies the nurture of entrepreneurial potentialities essential for conducting business. It drives individuals with aspiration and needed information regarding set up of business organizations (Senathiraja & Uluwaduge, 2020). A nation's financial growth mostly depends on the generation, growth, and sustainability of entrepreneurship development (Fiseha & Oyelana, 2015; Meyer & Meyer, 2020; Rusu *et al.*, 2022). It is only active and enthusiastic entrepreneurs who bring about changes and innovation exploring the potentialities of the country's available resources-labor, technology, capital, materials, and other assets that create value (Hisrich, 1990). From a psychological point of view an entrepreneur is a person driven by certain needs which makes him to be independent. From the capitalist point of view an entrepreneur is one who creates wealth, utilizes resources, and generate employments for the betterment of the society (Vesper, 1980). For social and economic development process entrepreneurship is an inevitable factor because it exhibits leadership, generate original thought, set up financial and social structures to make resources and circumstances more useful, and be willing to take risks and fail. (Leibenstein, 1968).

For the economic development of Bangladesh it is necessary to take initiatives in creating wealth, generating employment, and alleviating poverty through entrepreneurship development. A good number of institutions are taking various initiatives to develop an entrepreneurial class in Bangladesh. Bangladesh Small and Cottage Industries Corporation (BSCIC) are one of them under the Government of Bangladesh (GoB) sponsored engage in the growth and extension of the country's small and cottage industries. The main objective of BSCIC is to create entrepreneurship and develop industrial entrepreneurship. BSCIC provides financial loans and infrastructure facilities to entrepreneurs to set up their factories. BSCIC, one of the leading corporations vested with this responsibility in

Bangladesh, has initiated so far various programs for the upliftment of entrepreneurs in small and cottage industries. At the initial stage, BSCIC had been engaged mainly with commercial activities like import of plants and machinery, raw materials and distribution of the same to private sector entrepreneurs. Thereafter the focus has shifted from commercial to promotional and development activities. Apart from promotional and development activities, BSCIC also in cooperation with the financing institutions/commercial banks formed consortium for financing credit requirements of SCIs in local as well as foreign currencies.

BSCIC has carried out substantial tasks to SCIs in order to broaden the industrial base from its early journey in 1957. The government amends several rules and regulations for proper activity monitoring in order to fulfill its responsibility for the development of entrepreneurs. The major commercial activities of SCIs included the import of raw materials, plant and machinery, and small loans to small business owners. BSCIC also offers technical and consulting assistance for improving the quality of SCIs products, marketing SCIs products, and helping entrepreneurs create business profiles and bids. It also helps them adopt the right technologies. The government has recognized the importance of having successful and numerous SMEs in the creation of an economically viable system and provides legislative responsibility to the BSCIC to formulate policy and to provide infrastructure, administrative assistance, fiscal and environmental support, and policy support. BSCIC gives loans to SCIs.

BSCIC prepare and implement investment schedules for SCIs; assists in setting up of SCIs; provides assistance to sick SCIs. It collects, collates and analyses industrial data and establish data bank for SCIs to support the governing body in developing policies in the field of SCIs. Moreover, it assists entrepreneurs with information relating to SCIs and develops manufacturing process and technology for development of SCIs. In order to provide SCIs with goods, BSCIC helps them with contract negotiations and building relationships with medium-sized and large businesses. Bangladesh Government formulated different SME policy in different time for competing internationally and moving toward in greater efficiency in production and structural adjustment (Rahman, 2010). These policies include trade policy, tariff rationalization, fiscal policy such as tax policy, wealth policy, and VAT policy. The coordination and implementation of this of the policy is introduced by BSCIC in SME sector for central monitoring.

Considering the massive socio-economic problems of Bangladesh like poverty, unemployment, and continuous pressure of population and the changing Government's policies, BSCIC's activities was reorganized to help the private sector entrepreneurs in establishing new enterprise. Now BSCIC is also conducting two kinds of activities - a) extension, promotion and regulatory functions under revenue budget that include entrepreneurship development, allotment of developed plot, preparation of project proposal etc.,(b) long-term development oriented activities under annual development program. BSCIC being the patronizing organizations monitors the amount of investment and number of employment generated in the SCIs sector. From its inception, BSCIC has taken a number of policies and various programs for the development of entrepreneurship,

but it has to face a number of hurdles in implementing them. Several studies were conducted on the role of BSCIC from time to time.

Rahman (2010) mentioned in his study about the major financial, industrial, and political constraints of entrepreneurship development in Bangladesh. The author stated that A united effort involving many lenders is required, such as Bangladesh Bank, BSCIC, National Commercial Banks, Private Commercial Banks, Specialized Banks or even insurance companies to make financing for the entrepreneurship development.

Jahed, Kulsum, and Akthar (2011) concentrated on a few important problems and obstacles related to the growth of female-run businesses in Bangladesh before offering some ideas for strategies. In their study, they discussed about the supporting services for the women entrepreneurship development in the country. According to Ahmed (1999), even though BSCIC has served as the primary public sector organization in charge of fostering the growth of SMEs and entrepreneurship, its operational efficiency is still low due to a variety of structural, executive, and managerial constraints. The research also indicated that certain promotional policies and assistance programs, like extension services, financial and material help from public sector organizations, as well as growth partners, haven't always been sufficiently successful. Training, credit promotional activities, and physical infrastructure provided by BSCIC's industrial estates program are just a few examples of the business advisory services that have been significantly less effective than intended due to poor and inefficient management and inadequate execution of various policy-related measures. Mamun and Bhuiyan (2002) conducted a research entitled entrepreneurial techniques in Bangladesh's government-backed businesses and found most of the underdeveloped countries where modern financial institutions are hesitant to offer financial aid, because there are no financial structures in place to the small entrepreneurs, individual and family sources are considered to be as important source to start a venture. Khan (1996) found that more than 54% entrepreneurs invested their initial capital from individual and family sources while bank and financial institutions contributed to 31% cases. Only 13% managed capital by arranging partnership. In the present study 73% entrepreneurs raised their initial capital from individual or family savings, only 18% received this from Directorate of Youth Development (DYD), 6% arranged from BSCIC and other non-government organizations, while only 3% received loan from relatives.

Momen and Rahman (1990) highlighted the Bangladesh's growth in business considerations in their study and presented the factors determining the entrepreneurship development in Bangladesh and suggested to the government to take initiative in guiding the selection of types of industries, their size, location and the funding pattern for developing the entrepreneurship conducive to the economic needs of Bangladesh. Another research work conducted by Tasneem and Razia (1993) focused on the nature of small units stated by relatively young entrepreneurs i.e. previous experience in engineering units, self motivation, and confidence influenced them to venture into business. She also found that there is an extensive use of borrowed capital. Among the working capital problems, credit sales were identified as major one.

A study by Uddin (1998) found the factors that are commonly associated with the success of entrepreneurship. He conducted this study on the evaluation of the performance of entrepreneurship in the Northern Region of Bangladesh and revealed that their entrepreneurial skill does not relate to their education, occupational background, nor does it depend on their age or product related education and experience to attain success in industrial activities. Khan et al., (2012) have conducted a study from institutional perspective on perception of the constraints for small and cottage industrial growth in Bangladesh. The authors found that as an institution The current enterprise/entrepreneurship development methods in Bangladesh require both conceptual and ability to perceive from BSCIC in order to support the growth of new and incumbent small businesses as well as other relevant organizations.

BSCIC, a corporation for SCIs, extends various support such as training, financial help and various advices to entrepreneurs. Various studies have been done on entrepreneurship development addressing various related issues or fields but no research have been conducted so far focusing on multiple roles of BSCIC in entrepreneurship development. The northern region of Bangladesh is industrially least developed (Hasan *et al.*, 2022). Despite the role of BSCIC providing support services in initializing, growing, and sustaining entrepreneur activity in the region under study is not supposedly equivalent to that it plays in the other regions or parts. Moreover, the earlier related studies also lack the proper findings embodying the reasons hindering the achievement of targets set for developing entrepreneurs in the region under study in Bangladesh. In addition, the idea about the disposition and attitudes of the entrepreneurs toward the quality of support services provided to them by BSCIC in northern region is scholarly limited leaving a room for further study, which the current study is attempting to address. Consequently, the study would focus on the assessment of the role of BSCIC in entrepreneurial development in Bangladesh, particularly in northern zone, which will have both theoretical and policy implications.

Numerous earlier studies have been examined to determine the function of BSCIC in entrepreneurial development in Bangladesh but in the previous studies the role played by the institution under study was not thoroughly identified in developing entrepreneurial class, even the idea is far away in the context of a region of the country like northern zone. BSCIC has been trying to implement its programs as per its policies, yet it has been confronting multifaceted obstacles in materializing that, especially the programs associated with entrepreneurship development which is not well documented. Moreover, the perceptions of the entrepreneurs regarding the support services provided by BSCIC in generating, growing, and sustaining entrepreneurs in Bangladesh particularly in the Zone under study has obviously left a gap that must be filled up through scholarly investigation. The earlier related studies also lack the proper findings embodying the reasons hindering the achievement of targets set for developing entrepreneurs in Bangladesh. Consequently,

this study focused on the assessment of the role of BSCIC in entrepreneurial development in Bangladesh particularly in northern zone, which have both theoretical and policy implications. The current study, therefore, is an attempt to fulfill the lacuna by getting answers for the following research questions:

3. Methodology

3.1 Research Design

A sequential explorative mixed-methods approach it includes both qualitative and quantitative is adopted by this study employing pragmatist research paradigm view. To attain the objectives of this study, firstly, qualitative approach applied to explore the support services provided by BSCIC at the initialization, growth, and sustenance stage of entrepreneurship development in the Northern region of Bangladesh. Then, based on the existing literature, opinions, and arguments of the participants during qualitative study, a model has been developed to test the dispositions and attitudes of the entrepreneurs towards the support services provided to them by the said institution in the region under study. Therefore, in the 2nd phase, quantitative method applied to test the theories generated from the first phase's conceptual model.

3.1.1 Interview Questionnaire Development for Qualitative Phase

The face-to-face in-depth interviews using semi-structured questionnaire used to explore the support services provided by BSCIC at the initialization, growth, and sustenance stage of entrepreneurship development in the Northern Zone of Bangladesh. After conducting literature reviews the authors prepared a semi-structured questionnaire (Appendix-A) consisting of 5 key questions and 16 probing questions to know the support services provided by BSCIC at different stages of entrepreneurship development in the field under study.

3.1.2 Sample Selection and Data Collection for Qualitative Phase

Purposive sampling was followed in this research in the qualitative phase. In this study, Based on personal relationships, 19 participants were chosen for interviews; Van Kaam (1959) states that a sample size of 10 to 50 is sufficient. Both email and mobile phone were used to get in touch with the responders. Prior to the interview, participants were provided with a semi-structured questionnaire that unambiguously stated the study's objective. Each interview lasted between 30 minutes and an hour. During the interview, participants were requested to authorize the mobile recorder to capture their voice. Only one of the participants refused to agree. When respondents declined to allow the recorder to be used, essential points were written down.

Table 1: Demographic Profile of the Respondents

Sl. No	Respondents Code	Gender	Age	Profession	Experience	Education
1	EPR1	F	35	Boutique Business	14 Years	SSC
2	EPR2	F	36	Fashion Items Business	13 Years	SSC
3	EPR 3	M	29	Show Piece Items Business	5 Years	Under HSC
4	EPR 4	F	35	Ornaments Business	12 Years	Under HSC
5	EPR 5	F	45	Boutique Business	17 Years	Under SSC
6	EPR 6	M	50	Agricultural Equipments	31 Years	Bachelor
7	EPR 7	M	37	Metallic Utensils Business	10 Years	Under SSC
8	EPR 8	F	35	Pulse Factory Business	16 Years	Bachelor
9	EPR 9	F	58	Jute Items Business	35 Years	Masters
10	EPR 10	M	33	Toy Items Business	11 Years	Under SSC
11	ATR 1	M	39	Estate Manager	10 Years	Masters
12	ATR 2	F	43	DM, BSCIC	15 Years	Masters
13	ATR 3	M	37	Estate Manager	11 Years	Masters
14	ATR 4	M	39	Estate Manager	12 Years	Masters
15	ATR 5	M	68	Estate Officer (Ex)	32 Years	Masters
16	ATR 6	M	38	Evaluation Officer	11 Years	Masters
17	ATR 7	M	42	Specialist	14 Years	Masters
18	ATR 8	M	45	Specialist	15 Years	Masters
19	ATR 9	F	35	Administrative Officer	7 Years	Masters

Note: EPR: Entrepreneurs under BSCIC estate; ATR- Authority of BSCIC

3.1.3 Data Analysis for Qualitative Phase

The interviews were first transcribed implementing cell phone records and notes recorded during the interviews in order to evaluation the data gathered during the field analysis. The data was subsequently analyzed and interpreted using the thematic analysis approach, which evaluated the relationship between concepts, interview data, and theoretical meaning.

3.1.4 Constructs and Observed Variables Derived from Qualitative Phase

The findings on related observable variables shown in Table 2 were attained after careful consideration and combining. The frequency of the opinions expressed by those who took part in that qualitative field study is displayed in the table.

Table 2: Participants Opinion Regarding the Support Services Provided by BSCIC for Entrepreneurship Development

Items	Participants																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
BSCIC has got required infrastructural facilities to generate entrepreneurs.	√		√	√	√		√	√	√	√	√	√	√	√	√	√	√	√	√
BSCIC provides infrastructure facilities to start a new business.	√		√				√	√		√	√	√	√	√	√	√	√	√	√
BSCIC arranges credit facilities to the prospective entrepreneurs.	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
BSCIC has the pre-investment counseling program.	√		√	√	√		√	√	√	√	√	√	√	√	√	√	√	√	√
BSCIC arranges basic training program for the prospective entrepreneurs.	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
BSCIC encourages entrepreneurs to attend training program.	√		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
BSCIC encourages entrepreneurs to attend skill development training.	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
BSCIC helps entrepreneurs in providing market related information.	√		√		√		√	√	√	√	√	√	√	√	√	√	√	√	√
BSCIC always has supportive behavior towards entrepreneurs.	√	√	√		√	√	√	√		√	√	√	√	√	√	√	√	√	√
BSCIC posses creative management attitude towards entrepreneurs.	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
BSCIC always motivates entrepreneurs to carry on their existing business.	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
BSCIC inspires entrepreneurs providing more facilities who are committed to be a successful entrepreneur.	√		√	√	√		√		√	√	√	√	√	√	√	√	√	√	√
BSCIC always shares innovative ideas with the entrepreneurs to add value to their businesses.	√		√		√	√	√		√	√	√	√	√	√	√	√	√	√	√
BSCIC arranges orientation for technological knowledge.	√					√			√	√		√		√		√			
Entrepreneurs are being generated through support services provided by BSCIC.	√		√			√		√	√		√	√	√	√	√	√	√	√	√
BSCIC is providing support services at growing stage for the development of entrepreneurs.	√		√	√	√		√	√	√	√	√	√	√	√	√	√	√	√	√
BSCIC provides necessary support services for the sustainability of the entrepreneurs.		√	√	√	√	√	√		√	√	√	√	√	√	√	√	√	√	√

Source: Adapted by the Authors through Qualitative Field Study

Above table 2 shows, out of 19 participants 17 gave their opinions that BSCIC has got required infrastructural facilities to generate entrepreneurs and 14 participants agreed that it provides infrastructure facilities to start a new business. All interviewed respondents acknowledged that at the initial stage BSCIC arranges credit facilities to the prospective entrepreneurs to start their business. Almost interviewees told that BSCIC has the pre-investment counseling program and also arranges basic training program for the prospective entrepreneurs. This institution encourages entrepreneurs to attend training program, skill development training for growing up their businesses and also provides

market related information so that entrepreneurs can grow their business smoothly. All the respondents of this study agreed that BSCIC always has supportive behavior towards entrepreneurs which helps to create the environment of entrepreneurship development in the area under study. The analyzed data shows, all participants mentioned that BSCIC possesses creative management attitude towards entrepreneurs and always motivates entrepreneurs to carry on their existing business which are the dominating support to uplift entrepreneurial class. Moreover, for making sustainable entrepreneurship development BSCIC inspires entrepreneurs providing more facilities that are committed to be a successful entrepreneur and also shares innovative ideas with them to add value to their businesses. At this stage it also arranges orientation for technological knowledge. The participants opined that entrepreneurs are being generated through support services provided by BSCIC, it is also providing support services at the growth and the sustenance stages for the development of entrepreneurs in the field under study. Such arguments relating to the support services by the BSCIC for entrepreneurship development at all the three stages guided the researcher to construct the following model (Figure 1).

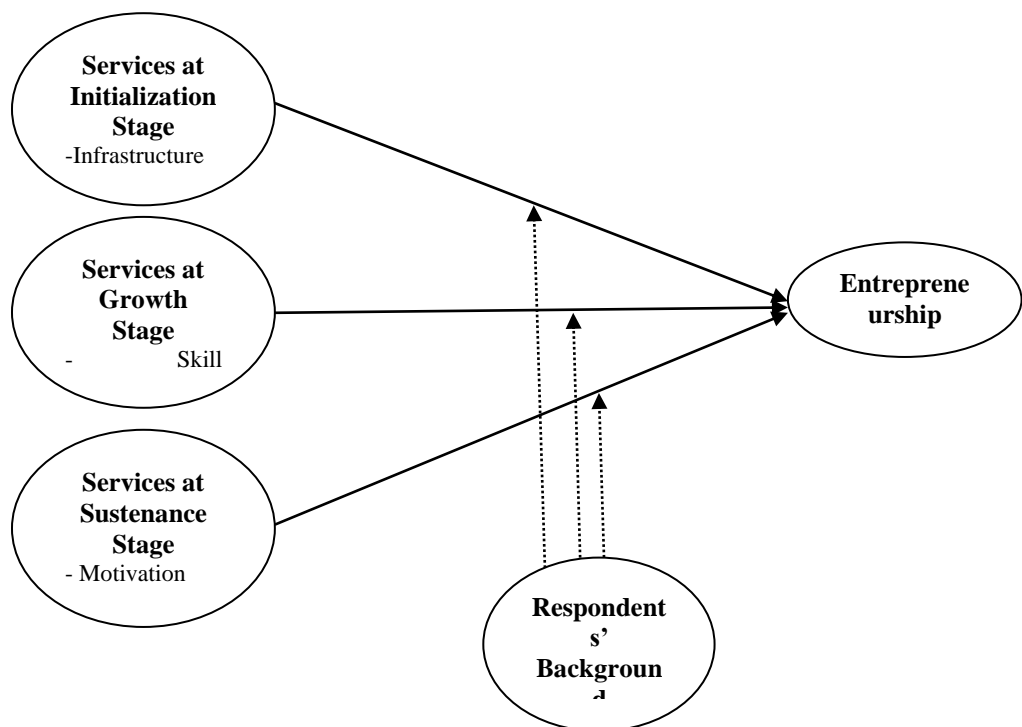


FIGURE 1: Conceptual Research Model

Source: Developed by the Authors

3.2 Quantitative Phase

This phase aimed to test the hypotheses relating to dispositions and attitudes of the entrepreneurs towards the support services provided to them by the BSCIC in the region under study.

3.2.1 Underpinning Theories and Hypothesis Development

There have been a number of excellent reviews of institutional theory in the last few years (Marquis et al., 2007; Scott, 1987, 2005; Tolbert & Zucker, 1996; Zucker, 1987). The institutional theory has been widely used (DiMaggio, 1997; Sabini & Muzio, 2012) in most of the organisations (Osman et al., 2015). This theory is contrasted with a number of other theories like agency theory, legitimacy theory, etc. (Zucker, 1987). Work on enterprise is increasingly using the idea of institutions as a lens. Over the years, institutional theory has appeared as a leading perspective in organizational researches (Dacin, Goodstein, & Scott, 2002) that takes into account the methods by which systems—such as plans, regulations, customs, and practices—become accepted as the final word on acceptable social conduct. This process is termed as an institutional work. Moreover, this institutional process is based on the idea of institutionalization based on which organisations tend to follow the norms, values and beliefs of the current institutions in order to acquire credibility and enhance future prospects (DiMaggio & Powell, 1983; Tolbert & Zucker, 1996). There are three mechanisms that give rise to the institutional theory (Isomorphism pressure) namely regulative, normative and cultural-cognitive pressure (Palthe, 2014; Scott, 2012). Consequently, it is evident that institutional logics have been the primary basis for entrepreneurship research's examination of institutional impacts and interacts in the entrepreneurial process (Su et al., 2017). Stakeholder theory also forms the foundation for understanding the relationship that exists between an institution and its stakeholders (Donaldson & Preston, 1995; Freeman et al., 2010; Weinestedt, 2009; Yekini, 2012). Furthermore, this theory acknowledges the fact that incorporations identify the stakeholders whose interests are most crucial and relevant to the institution. Here, instead of focusing on the powerful stakeholders (primary stakeholder), the consideration is given to the institutional stakeholders who can indirectly influence the decision-making process of the institution.

3.2.1.1 Support by BSCIC for Initializing Entrepreneurship Development

Support service usually provides entrepreneurs that they need to start and operate effectively their businesses. They helped in the collection of information, extended the encouragement to entrepreneurs, and conducted industry-specific mentoring. In Bangladesh, the primary agency tasked with promoting and developing small, cottage, and rural businesses is BSCIC (Islam, 2020). The BSCIC Industrial Estates provide various infrastructural facilities like developed plot, connection of road and various utilities (like gas, water, electricity), and other services (like post office, banks, etc. (Jasmin & Mamun, 2009). In this case, infrastructure facilities, credit arrangement, raw materials, and pre-investment counseling have a significant impact on entrepreneurship development in initialization stage.

H1: Support services provided by the BSCIC as perceived by the respondents have association with entrepreneurship development at its initial stage.

3.2.1.2 Growth Support Services by BSCIC to Entrepreneurship Development

Various support systems have been launched to encourage the entrepreneurs and, in turn, to enhance growth of the sector. The growth of an entrepreneurship very much depends on the successful market studies of the products produced. Accordingly, it is very much needed to identify, develop and accumulate potential products for the promotion in turn marketing of products; upgrading of the quality; developing and applying new designs to maintain the quality; promoting sales through publication and circulation of price list, catalogue, leaflets, etc.; developing positive attitude of local buyers towards products; and exploring the possibilities in the international markets (Jasmin & Mamun, 2009). SMEs frequently struggle to enter international markets due to different types of limitations and difficulties Uddin (2014). In order to give regional businesses more advantages, the BSCIC introduced a subcontracting program in 1986. The program was envisioned to discover complementary industries, make connections, facilitate the signing of memorandums of understanding, and to support the implementation of various subcontracts. The program was also meant for promoting concept of working together as subcontractors and encouraging small engineering businesses to participate in open competitions for contracts with major corporations. Through subcontracting, BSCIC offers promotional services to support the growth of small businesses and industries.

Regarding this issues, sub-contracting arrangement, management and skill development training, market study, supportive and creative behavior of management significantly affect the growth of entrepreneurs. In the purview of the above discussion following hypotheses has been formed for the current study purpose.

H2: Support services provided by the BSCIC as perceived by the respondents have association with entrepreneurship development at its growth stage.

3.2.1.3 Sustenance Support of BSCIC on Entrepreneurship Development

Sustainable development of entrepreneurship generates greater economic benefit of both the entrepreneur and the country. It may depend on the factors like motivation of entrepreneur, innovation, and application of new technology. In previous research, innovativeness could lead to the development of creative and new idea that helps to gain considerable success in entrepreneurial development (Hurley *et al.*, 1998). It reflects entrepreneur to take new technology and to move toward developing creative ideas for sustainability. It means that motivation, innovation and application of new technology directly effect on the entrepreneurship development in sustenance stage. As a result, the following hypothesis has been formulated.

H3: Support services provided by the BSCIC as perceived by the respondents have association with entrepreneurship development at its sustenance stage.

3.2.1.4 Moderating role of Respondents Background to Entrepreneurship Development

Some factors such as years of work experience and involvement with entrepreneurial development institution have an impact on entrepreneurial development and endeavor of entrepreneurs. In their paper, Olowa & Olowa (2015) noted that having greater knowledge and a suitable degree related to the adoption of innovations and skills needed for entrepreneurship development greatly improve owners' and managers' capacity for making decisions, which in turn promotes the growth of entrepreneurship. They also mentioned that an owner/manager who has expertise in both both areas is probably equipped with the abilities that are required to meet the demands of the current business endeavor. In this case, respondent background like institutional attachment and experiences can be having significant moderating impact on the relationship of services provided by the BSCIC at different stages from initialization stage to growth stage to sustenance stage for sake of developing entrepreneurship. Above all, the hypothesis as follows-

H4a: Respondent background has moderated the relationship of services provided by the BSCIC at the initialization stage and entrepreneurship development.

H4b: Respondent background has moderated the relationship of services provided by the BSCIC at the growth stage and entrepreneurship development.

H4c: Respondent background has moderated the relationship of services provided by the BSCIC at the sustenance stage and entrepreneurship development.

3.2.2 Research Design for Quantitative Phase

The researchers collected cross-sectional data form Rajshahi, Natore and Bogura districts of Bangladesh. This study has been carried out through field survey using structured questionnaire with 6 points Likert Scale (Appendix-B). The researchers collected entrepreneurs' opinions regarding the support services provided by BSCIC using a 6-point likert scale range from 1 for strongly disagree to 6 for strongly agree. A total number of 243 responses were collected from the entrepreneurs of the studied area using the mixtures of purposive, convenience and snowball sampling technique through face-to-face interviews. This sample size satisfies the prerequisite for the desired sample size i.e., the researchers used 23 observed variables times ten respondents to get a sample size of 230. The perceptions of the entrepreneurs were measured through 3 exogenous variables i.e. support services provided by BSCIC at initial stage, growth stage and sustenance stage and 1 endogenous variable i.e. entrepreneurship development. Entrepreneurs' demographic characteristics such as education, experience, and involvement with BSCIC were used as moderating variables to measure relationship between exogenous and endogenous variables. Structural Equation Modeling (SEM) with partial least squares (SmartPLS 4.0) software was used for data processing and analysis (Hair et al., 2019).

3.2.3 Measurement Tools for Quantitative Phase

The structured questionnaire used for conducting this study consists of two parts. The first part consists of the demographic profile of the respondents. The demographic part included gender, age, marital status, level of education, years of experience and involvement with BSCIC. The second part of the structured questionnaire contained the questions relevant to different stages of entrepreneurship development cycle. This questionnaire was prepared using multi-item questions adopting a 6-point Likert scale derived from the previous literature and qualitative field survey. To collect the perceptions of entrepreneurs regarding support services provided by the BSCIC 4 items were used at the initial stage, 7 items were used at the growth stage and 6 items, at the sustenance stage. The 4 items at the initial stage were derived from the previous literature of Duong (2022); Latif and Khanom (2013) and, Bux and Van Vuuren (2019); 7 items at the growth stage were taken from Uddin (2014); Hurley and Hult (1998) Dana et al. (2021) and Jiatong et al. (2021) and 6 items at sustenance stage were taken from Alauddin and Chowdhury (2015); Dana et al. (2021) and Jiatong et al. (2021). The measurement items of the endogenous variables were derived from Abdullah and Latif (2014) and Zengyu et al. (2013). The researchers followed Favreau and Lévesque, (2011); Duong 2022); Schwarz et al. (2009), Bux and Van Vuuren (2019) and Dana, et al. (2021) to develop the items of demographic characteristics of the measurement questionnaire.

3.2.4 Data Collection Procedure for Quantitative Phase

The researcher communicated with the entrepreneurs those who were recipients to the support services provided by the BSCIC. The questionnaires were distributed personally directly to the entrepreneurs through postal mail and emails. Out of 300 questionnaires 260 were collected and 243 were used. Since the respondents are homogeneous, the 243 responses have been considered satisfactory. In order to proceed with successful data analysis, researchers must first evaluate the questionnaires pertaining to each respondent's responses before transferring the data to a mathematical setup (Neuman 2000; Nuruzzaman, 2013). In this study, the collected data were reviewed to seek out errors, invalid data, and missing values even blank questionnaires. During the data screening procedure it was found that 17 questionnaires were incomplete. This data screening procedure was conducted to prepare clean data for conducting a valid and reliable research analysis (Nuruzzaman, 2013).

3.2.5 Respondents' Profile

The demographic profile of the respondents (N = 243) was as follows:

Table 3: Respondent Profile

		% & N
GENDER	FEMALE	33.74% (N=82)
	MALE	66.26% (N=161)
AGE	18-23 YRS	3.70% (N=9)
	24-29 YRS	9.46% (N=23)
	30-35 YRS	23.06% (N=56)
	<36 YRS	63.78% (N=155)
MARITAL STATUS	MARRIED	95.47% (N=232)
	UNMARRIED	4.53% (N=11)
EDUCATION	GRADUATES	32.70% (N=79)
	UNDERGRADUATES	67.30% (N=164)
EXPERIENCE AS AN ENTREPRENEUR	< 5 TO 10 YRS	30.60% (N=74)
	< 10 YRS	69.4% (N=169)
INVOLVEMENT WITH BSCIC	>2 TO 2 YRS	29.60% (N=72)
	<2 TO 5 YRS	32.70% (N=79)
	< 5 TO 10 YRS	4.10% (N=10)
	< 10 YRS	33.70% (N=82)

3.2.6 Data Analysis Technique for Quantitative Phase

Statistical tools like SPSS and PLS-SEM are employed for analysis of data in order to assess the research's assumptions (Hair et al., 2014; Henseler, Ringle, & Sarstedt, 2009).

3.3 Results and Findings of Quantitative Phase

3.3.1 Goodness of Measurement Model

Given that the Variance Inflation Factor (VIF) levels in this study are less than 5, convergence amongst exogenous variables does not appear to be an issue (Hair et al. 2014). The current investigation establishes the convergent validity in the test model (Table 4) by performing factor loading, Cronbach's Alpha ($CA\alpha$), composite reliability (CR), and average variance extracted (AVE) (Sarstedt et al., 2020). As suggested by Hair et al. (2019), this study used a loading limit point of 0.60; Scholtz et al. (2016) claimed that to obtain improved AVE and CR. Table 4 below demonstrated that five items (SSIS3, SSGS6, SSGS7, SSSS4, & ED4) were removed after the main loading was evaluated since their loading was less than 0.60. The remaining conclusions exceeded a set of threshold values: the AVE over the parts loading on an object must be beyond the recommended value of 0.5 (Rigdon et al., 2017); the CR is appropriate in the range of 0.70 to 0.95 (Hair et al., 2019); and the $CA\alpha > .70$ (Shmueli et al., 2019).

Table 4: Convergent Validity of Measurement Model

CONSTRUCT	MEASUREMENT ITEM	OUTER LOADING	CR (RHO_A)	CR (RHO_C)	AVE	CA A
ED	ED1	0.922	0.948	0.964	0.899	0.944
	ED2	0.929				
	ED3	0.992				
	ED4	0.087				
RB	RB1	0.902	0.880	0.921	0.854	0.832
	RB2	0.946				
SSGS	SSGS1	0.640	0.988	0.885	0.613	0.857
	SSGS2	0.632				
	SSGS3	0.928				
	SSGS4	0.733				
	SSGS5	0.926				
	SSGS6	-0.640				
	SSGS7	-0.067				
SSIS	SSIS1	0.906	0.853	0.911	0.773	0.852
	SSIS2	0.912				
	SSIS3	0.343				
	SSIS4	0.817				
SSSS	SSSS1	0.889	0.866	0.894	0.632	0.857
	SSSS2	0.867				
	SSSS3	0.704				
	SSSS4	0.276				
	SSSS5	0.643				
	SSSS6	0.844				

All of the scores on the diagonals were bigger than the associated row and column values, showing that the indicators were prejudice, according to Table 5's Fornell-Larcker criteria for assessing validity for discrimination.

Table 5: Discriminant Validity of Constructs-Fornell-Larcker Correlation Check

Construct	ED	SSGS	SSIS	SSSS
ED	0.948			
SSGS	-0.755	0.783		
SSIS	0.698	-0.254	0.936	
SSSS	0.815	-0.422	0.879	0.795

Note: ED= Entrepreneurship Development, SSGS= Support Services at Growth Stage, SSIS= Support Services at Initialization Stage, SSSS= Support Services at Sustenance Stage

Heterotrit-Monotrait Ratio (HTMT)

Gold et al. (2001) also disagreed with him and suggested a value of 0.90.

Table 6: Heterotrit-Monotrait Ratio (HTMT) Criteria

Construct	ED	SSGS	SSIS	SSSS
ED				
SSGS	0.701			
SSIS	0.773	0.535		
SSSS	0.820	0.650	0.890	

3.3.2 Inner Model Evaluation

Hair et al. (2018) state that effect size (f^2), coefficient of dependency (R^2), and checked redundancy (Q^2) estimations are used to analyze the inner model. The inner estimation of the study's exogenous, moderating, and endogenous variables—both direct and indirect—is displayed in figures 3 and 4. According to Hair et al. (2014), the f^2 equation shows how much of the unexplained variance is explained by R^2 change. The f^2 outcomes in this investigation are:

Table 7: Effect Size (f^2)

Relations	f^2	Remarks
SSIS→ED	0.142	Medium
SSGS→ED	0.001	Small effect
SSSS→ED	0.248	Medium
RBxSSIS	0.205	Medium
RBxSSGS	0.049	Small effect
RBxSSSS	0.139	Medium

The figure 3 showed the R^2 of 87%, therefore the direct effect of external factors on internal factors shows the large; on the other hand, the figure 4 showed the R^2 of 91.2%, therefore the respondent background has a large impact on the relationship of entrepreneurship development and services provided by the BSCIC at the initialization, growth and sustenance stage. The model is considered to have predictive relevance as all values of the Q^2 are higher than zero, so, the model has sufficient predictive relevance.

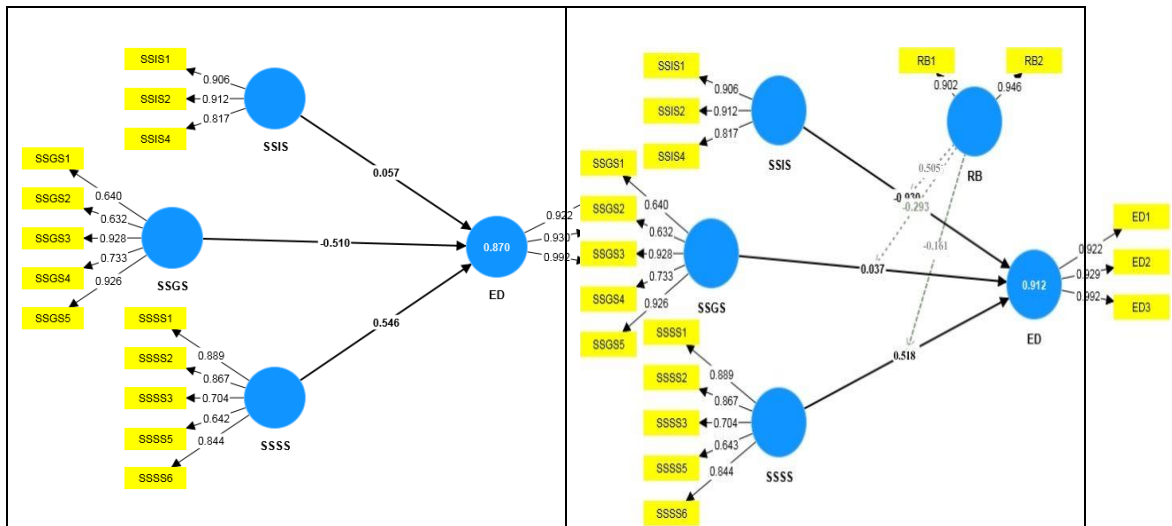


Figure 3 & 4: Inner Model Evaluation

Table 8: Summary of Hypotheses

Hypothesis	Direct Path	β	SE	t-value	P-value	Decision
H1	SSIS → ED	-0.930	1.412	0.659	0.510	Not Supported
H2	SSGS → ED	0.037	0.257	1.710	0.020	Supported
H3	SSSS → ED	0.518	0.932	8.086	0.000	Supported
H4a	RB x SSIS → ED	0.505	2.156	7.698	0.000	Supported
H4b	RB x SSGS → ED	-0.293	0.577	0.507	0.612	Not Supported
H4c	RB x SSSS → ED	-0.161	0.242	0.518	0.605	Not Supported

Note: $p < 0.05$, (based on Two-tailed test with 5000 bootstrapping)

3.3.4 Findings of the Quantitative Phase

Six hypotheses were established and evaluated, H1, H2, H3, H4a, H4b, and H4c, based on the pertinent literature and field investigation. Particularly, the result regarding H1 ($\beta=-0.930$, $t=-0.659$, $p < 0.5100$) showed that the perception of entrepreneurs regarding the support services provided by the BSCIC for entrepreneurship development at the initialization stage is insignificantly negative. Therefore, based on the perceptions of the entrepreneurs regarding the infrastructural facilities, credit arrangement, pre-investment counseling, and primary training support services provided by BSCIC are negative. The support services by the BSCIC at the growth stage such as Skill Development Training, Market information, Customer related information, supportive Behavior and Upholding creativity perceived significantly positive by the entrepreneurs H2 ($\beta=0.037$, $t=1.710$, $p < 0.020$). Another hypothesis developed and tested H3 ($\beta=0.518$, $t=8.086$, $p < 0.000$) and found that the perception of the entrepreneurs are significant towards support services such as motivation, promoting innovation, promoting change and providing training on technological application provided by the BSCIC at the sustenance stage. This study also developed a moderating impact of entrepreneurs' background characteristics such as experience and years of involvement with BSCIC between support services at initialization stage, growth stage, and sustenance stage and entrepreneurship development. From the table 8, it was found that the moderating impact of entrepreneurs' background characteristics between support services at initialization stage on entrepreneurship development is significant H4a ($\beta=0.505$, $t=7.698$, $p < 0.000$). The moderating impact at growth stage is not significant H4b ($\beta=-0.293$, $t=0.507$, $p < 0.612$) and the same effect of entrepreneurs' background characteristics at sustenance stage regarding the service provided by the BSCIC and entrepreneurship development is no significant H4c ($\beta=-0.161$, $t=0.518$, $p < 0.605$). Therefore, H1 showed that the perception of entrepreneurs regarding the support services provided by the BSCIC for entrepreneurship development at the initialization stage is negative, that is not supported but the respondents background moderated the relationship regarding the perceptions of the entrepreneurs towards the support services provided by the BSCIC and the hypothesis becomes accepted.

3.3.5 Discussion of the Comparison of the Findings of Quantitative Phase with the Qualitative Phase

In qualitative phase of this study identified some support services provided by BSCIC authorities at the generating, growing, and sustaining stages of entrepreneurship development in the Northern Zone of Bangladesh. All interviewed respondents acknowledged that at the initial stage BSCIC arranges credit facilities to the prospective entrepreneurs to start their business. Almost interviewees told that BSCIC has the pre-investment counseling program and also arranges basic training program for the prospective entrepreneurs. This institution encourages entrepreneurs to attend training program, skill development training for growing up their businesses and also provides market related information so that entrepreneurs can grow their business smoothly. All the respondents of this study are agreed that BSCIC always has supportive behavior towards

entrepreneurs which helps to create the environment of entrepreneurship development in the area under study. The analyzed data shows, all participants mentioned BSCIC possesses creative management attitude towards entrepreneurs and always motivates entrepreneurs to carry on their existing business which are the dominating factors to uplift entrepreneurial class. Moreover, for making sustainable entrepreneurship development BSCIC inspires entrepreneurs providing more facilities that are committed to be a successful entrepreneur and also shares innovative ideas with them to add value to their businesses. At this stage it also arranges orientation for technological knowledge. The participants opined that entrepreneurs are being generated through support services provided by BSCIC, it is also providing support services at growing and sustaining stages for the development of entrepreneurs in the field under study.

Based on the outcome of the qualitative field study a model has been developed by the author to test the perceptions of the entrepreneurs towards the support services and 6 hypotheses (H1, H2, H3, H4a, H4b, and H4c) were developed. Among the 6 hypotheses, the proposed hypothesized relationships that were supported were: i. H1, that is, the perception of entrepreneurs regarding the support services provided by the BSCIC for entrepreneurship development at the initialization stage, ii. H4b, that is, the moderating impact of entrepreneurs' background characteristics at growth stage, and iii. H4c, that is, the moderating impact of entrepreneurs' background characteristics at growth stage were not supported based on the perceptions of the entrepreneurs towards support services provided by BSCIC for entrepreneurship development. On the other hand, the hypotheses H2, H3, H4a were supported that is, entrepreneurs' perceptions were significantly positive towards the support services provided by the BSCIC for the entrepreneurship development in the Northern Zone of Bangladesh at growth and sustenance stages that leads to have the positive sense regarding the services of BSCIC at the growth and sustenance stages.

4. Discussion, Implications, and Future Research Agenda

BSCIC has an important role to play in the economic activities of the country. It is providing support to grow SCIs where underlying forces are entrepreneurs. The effective and dynamic activities of BSCIC help in developing entrepreneurs, which in turn has a positive impact on economy and economic growth, besides it being the patronizing organization monitors the amount of investment and number of employment generated in the SCIs sector. From its inception BSCIC has been launching various programs for the development of entrepreneurship being guided by the related policies enacted from time to time by the government. This study explored the support services such as infrastructure facilities, credit arrangement, pre-investment counseling, primary training, skill development training, information about market, information about customer, supportive behavior; uphold creativity, motivation, innovation & change, training on technological application etc. provided by BSCIC at the initialization, growth, and sustenance stage of entrepreneurship development in the Northern Zone of Bangladesh which will help the policy makers, executives, and academics to make proper policies for entrepreneurship development. Most specifically, the outcome of the study will help the entrepreneurs to

raise their demand in supporting various services at initial and growing stages of their development as an entrepreneurial class in the country. This study will shed light for BSCIC to concentrate on the areas which are left ignored related to entrepreneurship development. Necessary policies and programs can be taken by the said organizations to improve the services towards entrepreneurship development. Moreover, the outcome of this study will make the government authorities and agencies aware of the scanty services availed by the entrepreneurs so that the government can take proper measures to make BSCIC more attentive. Last but not the least, the outcome of this study will contribute to the existing literature by adding the knowledge regarding the perceptions of the entrepreneurs towards the support services provided to them by BSCIC.

This study was conducted in the Northern Zone of Bangladesh only which is one of the noteworthy limitations. Therefore, in future a large area should be considered for having an exhaustive generalization of the role of BSCIC for entrepreneurial class development in Bangladesh. There should be a hypothesis to be incorporated in line with the existing rules, regulations, and policies of BSCIC association with the development of entrepreneurial scenario to be tested which is one of the limitations of this study. In future, researchers may consider larger sample size for both qualitative and quantitative phase to make the findings more reliable and valid.

Authors Contributions

MMK and ANMJK conceptualized and designed the study. MSU made data analysis and reporting. MMK drafted the manuscript with ANMJK. All authors read and approve the final manuscript.

Disclosure Statement

This study is a part of the PhD thesis conducted by Prof. Md. Mahbubul Kabir under the supervision of Prof. Dr. ANM Jahangir Kabir.

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Exploring Challenges and Opportunities in the Pottery Industry of the Northern Zone of Bangladesh

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Abstract

The aim of this study is to identify and analyze the barriers that impede the advancement of the pottery sector in the northern zone of Bangladesh. This study employed a qualitative methodological approach, utilizing purposive sampling to select 24 respondents directly involved in the pottery industry. Open-ended face-to-face interviews were conducted to collect data using a semi-structured questionnaire. The findings of the research shed light on the multifaceted challenges faced by the pottery industry, along with potential avenues for future development. Despite its cultural significance, the pottery industry is often overlooked and marginalized. This lack of recognition, coupled with labor shortages and raw material scarcity, has contributed to the stagnation of the industry, particularly in the northern region of Bangladesh. The research underscores the need for policymakers to recognize and address the systemic challenges faced by the pottery industry. Policy interventions focused on providing financial support, access to markets, gender equity, and training programs can facilitate the modernization and expansion of pottery businesses.

Keywords: Pottery Industry, Challenges, Future Direction, Northern Zone.

1. Introduction

One important prehistoric development that led to the Neolithic revolution in human civilization was the ability to make pottery. Pottery is significant in a nation that is primarily rural, has a relatively low income, and has basic requirements. Its impact led to the emergence of new cultural practices and

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drastically altered the way human cultures colonized the world. This tradition is still followed by a very small number of traditional groups worldwide (Kasemi, 2014). The skills and knowledge needed to make pots are passed down through the generations within the Potters group. This craft is exclusive to economies based on agriculture. High-quality pottery is now produced by a vast number of small and large-scale businesses throughout Bangladesh, making it a rather sizable business. These days, government intervention through the implementation of legislation to support traditional arts and crafts has led to research and development in the pottery industry (Qureshi, 1990). The heritage of pottery is losing oneself to the uses of excessive aluminum, iron, and silver products (Ali, 2014; Hossain et al. 2022). In the modern era, local production of pottery is not adequate to fill people's customized and sophisticated needs (Riehle et al. 2023). Because of inadequate financial support, marketing promotional activities, vocational training and lack of constrictive interaction between young educated person and old artist, pottery industry losing its quality production. Moreover, the local manufacturers cannot compete with the other alternate industries without using upgraded equipment due to the majority of the pottery industry's family-run businesses, the workforce's high proportion of unskilled laborers, the use of antiquated tools, and the workers' widespread illiteracy. The previous studies focused on the barrier to the development of the pottery industry in the southwest zone of Bangladesh but no research has been conducted on the barriers that hindering the development of the pottery industry in the northern zone of Bangladesh. Despite extensive research on pottery production across diverse regions and historical contexts, there remains a gap in understanding the barriers hindering the development of the pottery industry in the northern zone of Bangladesh. While existing literature sheds light on the socio-economic influences on pottery consistency, ornamentation, and production techniques worldwide, limited attention has been given to the specific challenges faced by pottery makers in this region. Understanding these barriers is crucial for developing effective strategies to support the growth and sustainability of the pottery industry in Bangladesh's northern zone. Therefore, the purpose of this study is to determine and examine the obstacles impeding the growth of the pottery industry in Bangladesh's northern region. Ultimately contributing to the formulation of targeted interventions and policies to address these challenges.

The article's remaining sections are laid out as follows. First, the research methodology have been described then data Analysis and Findings. The article concludes with discussion of finding, implication, limitation, and directions for future research.

2. Literature Review

Arthur (2014) conducted a comprehensive exploration into the interplay between the social and economic structures of the Gamo community in southwestern Ethiopia and their impact on pottery shape and ornamentation consistency. Through a comparative analysis within the community, the study investigated the hypothesis regarding the specialization of potters, particularly those dedicated as full-time artisans in a caste-based society marked by complexity. The research posited that distribution channels, including market dynamics and patron-client relationships, significantly influence the observed consistency in pottery morphology and decoration. Research in prominent women's pottery communities within Igboland by (Arthur 2014) revealed a decline and, in some cases, disappearance of traditional Igbo pottery due to the adoption of Western technology and education. Despite modernization's adverse effects, certain scholars underscored the persistence of pottery tradition in specific regions of Igboland due to its cultural significance.

Thebe (2017) argued that learning networks are instrumental in shaping the distinct boundaries observed in pottery crafting methods in southeastern Botswana, with language and ethnic ties playing a negligible role. Meanwhile, Wayessa (2011) highlighted the value of ethno archaeological research in comprehending the methods used by the Oromo people in western Wallaga, a region in southwest Ethiopia's highlands, to create pottery. Pottery making in this region is a generational practice within Oromo families, characterized by unique technical methods distinct from neighboring non-Oromo communities in terms of material properties and production processes. Sterba et al. (2009) carried out a controlled experiment in which they prepared several pastes from identical commercially available raw clay and then used Instrumental Neutron Activation Analysis for chemical analysis. This experiment aimed to provide insights into the impact of different tempers on pottery composition. Results indicated that while two distinct sampling methods (drilling and grinding) minimally affected the chemical composition, exceptions were observed in the concentrations of elements of As, Zr, and Hf. This variance may be attributed to the unpredictability of certain compounds like arsenic or the presence of zircon crystals (containing Zr and Hf), which may be partially lost when drilling. Furthermore, the experiment revealed that three different firing temperatures did not significantly alter the outcomes.

Ghazinoory (2020) highlights a challenging landscape within the industry, marked by declining demand for consumer goods and intensified competition from competitors. In response to these pressures, the imperative for innovation becomes paramount. However, the current capacity for innovation is constrained.

Ghazinoory (2020) adopts an "innovation ecosystem" perspective to address these challenges. Utilizing interviews, the study aims to elucidate the historical trajectory of the industry, assess its present status, pinpoint barriers and enablers of innovation, and devise a strategy for rejuvenation. Fouriki (2023) undertook an exhaustive examination of three collections from Chania spanning the entire Post-palatial period, from LM IIIA1 to LM IIIB2. Using petrographic examination of a range of fine and coarse ceramic objects, the research extensively investigated pottery manufacturing practices throughout the LM III era and identified primary pottery formulations. The study probed into questions concerning origin, production techniques, and the utilization of diverse raw materials for crafting various types of wares, from domestic coarse wares to fine and semi-fine ceramics kept in storage and transportation of essential goods and liquids.

Budi (2016) identifies the principal challenge faced by home-based industries as the limited lifespan of certain products, restricting their shipping beyond the Java and Bali islands. Moreover, insufficient use of technology for marketing, including social media and websites, coupled with a shortage of skilled human resources, presents additional obstacles for these businesses. Lack of inter-industry or community organizations further hampers the growth of these enterprises. Mangone (2008) distinguishes between two different production processes used in Monte Sannace in the fourth century BC to create red-figured Apulian vases. Some vases were crafted employing the conventional Attic technique, while others employed an alternative method, previously unidentified, entails covering the clay paste with a layer of crimson engobe before adding black gloss paint.

According to Botticelli (2020), two primary sources of raw materials are identifiable at Khalet al-Jam'a. During the Early and Middle Bronze Age, ceramics were produced using Moza-clay, characterized by its richness in calcium carbonate and the prevalence of limestone, calcite grains, dolomite, and occasional sedimentary siliceous rock fragments. In contrast, pottery production in the Iron Age is associated with clay derived from calcareous-foraminiferous-Rendzina soil, featuring a higher proportion of silty quartz and fewer microfossils. Firing temperatures were determined based on mineral composition, with samples indicating different firing temperatures ranging from below 800°C to 850–950°C, depending on the presence of specific minerals such as calcite, gehlenite, and wollastonite.

Busari (2023) underscores the multifaceted roles of pottery items in contemporary society, serving both traditional and religious functions while remaining economically accessible. Particularly in Ìjàyè, pottery not only preserves a rich cultural heritage but also satisfies economic, religious, and aesthetic needs across

diverse societal strata. Leclerc (2019) highlights the remarkable diversity in fabric types within the Lapita pottery collection, mirroring similar collections in the region. The assortment of fabrics found at Teouma suggests a lack of strict cultural directives regarding raw materials, indicating that material choice may not significantly influence the perception of finished pottery products. Experimental trials, as detailed by Moroni (2006), reveal the complex interplay of physical and chemical factors influencing firing processes, with heating rate and clay calcite content emerging as critical determinants. Biscuit firing temperatures ranged from 850 to 1050 °C for tiles and from 950 to 1050 °C for wares.

Overholtzer (2020) demonstrates that intricately adorned pottery from Xaltocan flourished during periods of political dominance and economic marginalization, indicating a decentralized approach to Aztec ceramic production that persisted despite changing governance structures. Jackson (2009) discusses the potential benefits of studio potters cultivating stronger cooperative relationships, though challenges in nurturing such connections persist, largely dependent on the nature of dyadic relations mirroring network governance frameworks. Mommsen (2016) notes that in a collection of red-figure vases from Olympia, local production predominated over imports from southern Italy, with locally crafted vases showing uniform clay composition. Saha (2019) outlines various challenges encountered in pottery production processes, including storage and preparation of raw materials, clay drying and coloring, product polishing, marketing, traditional design methods, packaging, and sales.

Furthermore, researchers have conducted numerous studies exploring the socio-economic influences on pottery production across different regions and historical periods. These studies have highlighted the impact of social and economic structures on pottery consistency and ornamentation, such as in the Gamo community of southwestern Ethiopia and the decline of traditional Igbo pottery in certain regions of Igboland due to modernization. Additionally, they address the significance of learning networks in southeastern Botswana and the generational practice of pottery constructing among the Oromo of western Wallaga, Ethiopia. Moreover, experimental analyses have explored chemical composition and firing temperatures, while studies have examined the obstacles encountered by home-based pottery industries and the differentiation of pottery production methods in historical contexts such as Monte Sannace in the 4th century BC and Khalet al-Jam'a during different ages.

Despite the extensive literature on pottery production and its socio-economic influences across various regions and historical periods, there exists a notable gap concerning the barriers that hindering the development specific to the pottery

industry in the northern zone of Bangladesh. While previous studies have explored factors such as social and economic structures affecting pottery consistency, ornamentation, and production techniques globally, there is limited research focusing on the challenges unique to pottery makers in this particular region. This literature gap highlights the need for a more nuanced understanding of the barriers constraining the development of the pottery sector in the northern zone of Bangladesh. Addressing this gap is essential for devising targeted interventions and policies to support the growth and sustainability of the pottery industry in this region.

3. Methodology

This study utilizes a qualitative methodology to achieve its objectives. The aim of qualitative research is to comprehend human ideas, behaviors, attitudes, and perceptions regarding specific social or non-social issues within their contextual circumstances. By employing open-ended questions, qualitative research methods encourage participants to freely articulate their opinions and beliefs. The objective of qualitative research extends beyond understanding "what" individuals believe to also uncovering the reasons "why" they hold those beliefs. Participants provide explanations for their choices and beliefs in their responses, and qualitative research techniques analyze the resulting data to generate findings that can be applied to a broader group of comparable cases. Disciplines such as sociology, anthropology, and psychology heavily influence qualitative research, enabling researchers to delve deeply into the data collection process and gather as much qualitative data as possible without constraints on the types of questions asked or responses received from participants.

The primary data for this study were collected through in-depth interviews 24 respondent's within pottery industry of the north zone of Bangladesh. Here, 24 respondents have been selected because the data saturated in this point of sample which means the results must be capable of some degree of generalization (Boddy, 2016). As a guide to sample size the idea of saturation is very helpful at the conceptual level, it provides little guidance for estimating actual sample sizes, prior to data collection (Guest et al., 2006). The selected respondents are directly or indirectly involved in management, making them relevant to the study's objectives. Due to their deep knowledge in their respective fields, the information provided by the respondents is of high quality, and the interviews took place in person. The purposive selection of these twenty four respondents ensured that the researchers obtained the necessary information relevant to the study topic. The respondents were asked open-ended semi-structured questions about various aspects of challenges faced by pottery industry and future prospects of pottery industry. Each

interview lasted approximately one hour, with permission granted for audio recording, and note-taking was employed where necessary. Careful adherence to interview protocols was maintained throughout the process. Table 1 displays the respondents' demographic characteristics.

Thematic analysis was applied to the collected interview data in a systematic manner because it is the 'go to' technique in much 'qualitative' research and popularity in 'qualitative' research which is designed to aid grounded theory's methods of coding and analysis (Blaikie, 2018; Byrne, 2015). Interviews were recorded using audio recorders, including those conducted online, and transcriptions were produced from the recordings. Additionally, note-taking techniques were utilized when recording interviews was not feasible. The transcriptions were thoroughly reviewed, and important issues or keywords were coded individually. Subsequently, the researchers created subcategories based on these codes to organize the interview data effectively.

Table 1: Demographic Profile of the Respondents

Sl. No.	Respondents Code	Gender	Age	Occupation	Involvement in pottery	Education	Monthly Income	Monthly Expenses
1.	PE1	M	50	Potter	40 Years	Illiterate	10000	10000
2.	PE2	M	70	Potter	55 Years	Illiterate	8000	8000
3.	PE3	M	57	Potter	50 Years	Illiterate	12000	10000
4.	PE4	M	65	Potter	50 Years	Illiterate	10000	10000
5.	PE5	M	31	Potter	20 Years	Primary	13000	13000
6.	PE6	M	27	Potter	10 Years	HSC	15000	17000
7.	PE7	M	40	Potter	27 Years	Illiterate	12000	12000
8.	PE8	M	18	Potter	2 Years	HSC	10000	10000
9.	PE9	M	50	Potter	37 Years	Illiterate	15000	15000
10.	PE10	M	65	Potter	50 Years	SSC	10000	10000
11.	PE11	M	31	Potter	18 Years	Primary	13000	13000
12.	PE12	F	50	Potter	36 Years	Illiterate	10000	10000
13.	PE13	F	70	Potter	53 Years	SSC	9000	8000
14.	PE14	F	57	Potter	30 Years	Primary	12000	10000
15.	PE15	M	65	Potter	50 Years	Illiterate	10000	10000
16.	PE16	M	31	Potter	20 Years	Primary	13000	13000
17.	PE17	M	27	Potter	10 Years	HSC	15000	17000
18.	PE18	M	40	Potter	27 Years	Illiterate	12000	12000
19.	PE19	F	34	Potter	12 Years	Primary	14000	11000
20.	PE20	M	50	Potter	40 Years	Illiterate	16000	11000
21.	PE21	F	70	Potter	45 Years	Illiterate	8000	8000
22.	PE22	M	57	Potter	50 Years	Illiterate	12000	10000
23.	PE23	M	65	Potter	50 Years	Primary	10000	10000
24.	PE24	F	31	Potter	20 Years	Primary	16000	14000

The respondents are predominantly male. Ages range from 18 to 70 years, indicating a diverse age group involved in pottery. The occupation of all respondents is pottery, suggesting a homogeneous sample in terms of occupation. Years of involvement in pottery vary, with some respondents having decades of experience while others have relatively fewer years. Education levels vary from illiterate to HSC, indicating a range of educational backgrounds among respondents. Monthly income and expenses vary among respondents, reflecting differences in earning capacity and financial management practices within the pottery industry. Overall, the table provides insight into the demographic and socioeconomic characteristics of individuals involved in the pottery industry, which can be useful for understanding the industry's workforce composition and economic dynamics.

4. Data Analysis and Findings

4.1 Challenges faced by pottery industry

One historic craft that needs to be given more prominence is pottery, but it doesn't get the credit it deserves. In the southern region, the pottery industry was in a slump due to a lack of raw materials and a labor shortage (Veluchamy, 2011). Pottery artists still perform their old tasks and are either uninformed about contemporary technology or lack the resources and self-assurance to adopt new technologies (Sanyal, Banerjee, and Majumder, 2010). Few artists gradually relocate to the surrounding cities in quest of employment. Despite being the initial traders, they now lack production and marketing expertise.

“According to the PE1, PE17, PE20, PE23 and PE24, Now-a-days most of the potter’s have raw material problems such as soil scarcity but in earlier they don’t have the problems. They also added that raw materials problems raise their production cost but the product price are not increase as per the growth of raw material cost.”

However, *“PE4, PE8 and PE10 stated that there is gender base problems in this industry. Men are usually search secured job on the other women thought that they didn’t get equal payment as men. But traditionally few numbers of women are working in this industry for their economic development as well as family support.”*

This statement supported by Yadav, 2022 and argued that women have participated in pottery industry due to the need of improving their socioeconomic expansion (Growth in the digital sphere, finance, economy, society, politics, and sustainability) of the entire community by comprehending their viewpoints.

In the words of Shabab (2014), pottery is highly sought after as an artistic item in larger metropolitan marketplaces, but it is more difficult to penetrate larger markets due to its lesser manufacturing and marketing capability. Another major issue is that there is a lack of information and promotion about Lalejin's pottery industry in travel brochures, despite the fact that this sector has the greatest rate of inflow exchange for Hamedan. However, the majority of potters lack understanding about contemporary marketing strategies and export goods due to the wide range of product dimensions and inadequate packing, which hinders their ability to promote and market their products.

“PE1, PE3, PE13, PE22, PE23 and PE24 stated that most of the potter’s are old ages and gradually losses their capacity to long distances marketing. They also added that there is no promotional activities of this product in modern area.”

“By supporting the statement PE4 and PE8 revealed, young generation are ignored the profession so that new marketing policy didn’t apply in this sectors.”

Experts and potters have also brought up topics related to technology and technical matters. The necessary equipment, moulds, and patterns are still made by native people and welders in pottery workshops, which can lower productivity and lower the calibre of the finished goods (Afrakhtehet, et. al. 2016). Another issue is structural and infrastructural weaknesses, such as the regional workshops' improper distribution and mismatch in style and industrial activity.

PE11, PE12, PE16, PE18 and PE20 reveal that

“Due to the innovation of steel, aluminum and plastic product, the demand of pottery product have diminished. The steel, aluminum and plastic product are designed by up-to- dated technology but pottery product are designed traditionally. For the reasons obsolete technology can’t meet the sophisticated demand of the consumers.”

The manufacturer must contend with obstacles like inadequate procedures for education and advancement, inexperienced painters, problems with the supply and marketing chains, and a dearth of understanding in modern pottery.

PE7, PE8, PE9, PE10, PE14 and PE16 Worried and told that.

“Young educated people’s perception have change and thought that pottery industry is traditional and old culture because new education systems are business, science and technology based. So they are not concern about their culture and history. They argued that there some economic perspectives such as Young educated people search sustainable future but the future of pottery industry is unstable and it sifted in new craft and innovation.”

Other concerns that have been brought up include money, which limits the potters' ability to upgrade their conventional kilns and ovens and utilize gas pipe systems (Afrakhtehet, et. al., 2016). This being said, failure to compete with Chinese items can also be attributed to imitation products, a lack of creativity, and recurring and monotonous patterns and forms. According to Miah (2007), the two biggest obstacles facing SMEs in Bangladesh, such as the pottery industry, are a lack of sufficient funding and high bank loan interest rates. Quy (2016) suggests that government measures should include financial support, marketing research expansion, information sharing about trademarks for SMEs like pottery, and strengthening connections with BSCIC and other organizations.

The statements by PE2, PE4, PE6 and PE10

“Told that primarily the financial organization agreed to provides loan but after knowing that it is pottery industry. They are not interest to approve the loan. He also added that sometime they get small amount of loan in high interest and sometimes it is too difficult to repay the loan in due time for excessive production cost and low revenue.”

On the other hand,

“Some agencies circulate the government have intention to support small industry and take lot of initiative. But we didn’t get proper facilities from government. We need training to cope with new technology and government financial support. Sometime BSCIC arranged some program but it have lot of formalities so that it is quite difficult to take it.” Stated by PE11, PE13, PE21 and PE24

4.2 Future Prospects of Pottery Industry

These days, there is a huge demand for ceramic products such as insulators, tiles, sanitary ware, dinnerware, and pottery on both the domestic and foreign markets. Product variations, use of technology in production, better transportation system, proper marketing channel, skilled potters, and co-operative society among potter community can bring back those golden days of pottery industry (Hossain, et. al., 2022). Both govt. and non govt. support such as provide much financial support the exhibition cum sale of different traditional and unique products of various art forms of Bengal with a vision to develop the endangered crafts like Sitalpati, Madurkathi, Terracotta and Pottery, Patachitra, Dokra, Wooden Mask and Clay Doll making, Kanthaetc as craft hub connected to national and international markets. But this type of hub is required in every district to ventilate our products for bigger population and for gaining more popularity.

PE1, PE3, PE6, PE8, PE11, PE13 and PE16 suggested that

“Not only that the young generation should be given lessons and awareness about our traditional art forms and its importance in our culture. If all the traditional art form became the part of our school syllabus as extra-curricular activities then more and more people will be interested to sustain these endangered art forms.”

There is an urgent requirement of female entrepreneur and participation of women as lead positions (Saha, 2019). Women are more convincing and obedient related to loan recovery and sustainability of business strategies. Potters need to pay much attention on new technology to adopt as well as the consumer sophisticated need based production.

PE2, PE8, PE13, PE20, PE22, PE23 and PE24 expected that

We need up to date training related to marketing and promotion as well as technological support to compete with new market rivalry. They also added, govt. support need for both financial and socio-economic development.

Table 2: Distribution of Construct on the Basis of Respondent

Constructs	PE1	PE2	PE3	PE4	PE5	PE6	PE7	PE8	PE9	PE10	PE11	PE12	PE13	PE14	PE15	PE16	PE17	PE18	PE19	PE20	PE21	PE22	PE23	PE24
Challenges faced by pottery industry	√		√	√	√	√	√	√	√	√	√	√	√	√		√	√	√		√	√	√	√	√
Future prospects of pottery industry	√	√	√			√		√			√		√		√	√			√	√		√	√	√

5. Discussion of the Findings

The findings from the research shed light on the multifaceted challenges faced by the pottery industry, along with potential avenues for future development. Despite its cultural significance, the pottery industry is often overlooked and marginalized. This lack of recognition, coupled with the dearth of labor and raw material scarcity, has contributed to the stagnation of the industry, particularly in the northern region, supported by Veluchamy, 2011. Urgent attention is needed to address these systemic issues and elevate the status of pottery as a valuable craft. Gender-based challenges persist within the pottery industry, with women facing

unequal opportunities and compensation compared to their male counterparts. However, the participation of women in pottery is crucial for their socioeconomic growth and empowerment this statement supported by Yadav, 2022. Efforts should be made to promote gender equality and create an inclusive environment within the industry. Poor marketing strategies and limited exposure to modern marketing techniques have hindered the reach of pottery products to broader markets Shabab, 2014 also argued that. Addressing these challenges requires investments in marketing education and promotional activities to enhance the visibility and competitiveness of pottery products, particularly in urban areas. The traditional methods of pottery production have become outdated in the face of technological advancements (Riehle et al. 2023). To meet the evolving demands of consumers, the pottery industry must embrace modern technology and innovation. This entails investing in research and development, as well as providing training opportunities for artisans to adopt new techniques and tools. Financial challenges, including high-interest rates and limited access to loans, pose significant barriers to the modernization and expansion of pottery businesses. Government policies should prioritize supporting SMEs in the pottery industry by providing financial assistance, access to markets, and training programs. Streamlining bureaucratic processes and reducing formalities can facilitate easier access to resources for pottery artisans. A shift in the perception of pottery as a traditional and outdated craft among young educated individuals poses a significant challenge to the industry's sustainability. Efforts should be made to raise awareness about the cultural significance of pottery and its relevance in contemporary society. Integrating pottery and traditional art forms into school curricula can foster appreciation and preserve cultural heritage among future generations. Despite the challenges, there are opportunities for revitalizing the pottery industry through innovation, collaboration, and policy support. Investments in technology, marketing, and skills development can enhance the competitiveness of pottery products in both local and international markets. Furthermore, fostering a supportive ecosystem for artisans, including female entrepreneurs, and promoting cultural awareness can pave the way for the resurgence of the pottery industry. Addressing the challenges facing the pottery industry requires a comprehensive approach that involves stakeholders at various levels, including policymakers, financial institutions, educational institutions, and the artisan community. By implementing targeted interventions and fostering a conducive environment for growth and innovation, the pottery industry can reclaim its position as a vibrant and sustainable sector contributing to cultural preservation and economic development.

6. Implications of the Study

The research underscores the need for policymakers to recognize and address the systemic challenges faced by the pottery industry. Policy interventions focused on providing financial support, access to markets, and training programs can facilitate the modernization and expansion of pottery businesses. Efforts to promote gender equality within the pottery industry are crucial for fostering an inclusive environment and empowering women artisans. Policies aimed at providing equal opportunities and compensation for women can contribute to their socioeconomic growth and empowerment. Investing in marketing education and promotional activities is essential for enhancing the visibility and competitiveness of pottery products. By leveraging modern marketing techniques, pottery businesses can reach broader markets, particularly in urban areas. Embracing modern technology and innovation is imperative for the pottery industry to meet the evolving demands of consumers. Investments in research and development, along with training opportunities for artisans, can facilitate the adoption of new techniques and tools. Addressing financial challenges, such as high-interest rates and limited access to loans, requires concerted efforts from both government and financial institutions. Streamlining bureaucratic processes and providing easier access to financial resources can facilitate the modernization and expansion of pottery businesses. Raising awareness about the cultural significance of pottery is essential for changing perceptions among young educated individuals. Integrating pottery and traditional art forms into school curricula can foster appreciation and preserve cultural heritage among future generations. Revitalizing the pottery industry requires collaborative efforts from stakeholders at various levels, including policymakers, financial institutions, educational institutions, and the artisan community. By working together and implementing targeted interventions, the pottery industry can reclaim its position as a vibrant and sustainable sector contributing to cultural preservation and economic development. Moreover, this study underscores the importance of addressing the multifaceted challenges facing the pottery industry through comprehensive and collaborative efforts. By implementing targeted interventions and fostering a conducive environment for growth and innovation, the pottery industry can realize its full potential and make valuable contributions to cultural preservation and economic development.

7. Limitations and Future Research Directions

The major weakness of this study is that focused on sample size which does not give a comprehensive view on pottery industry. Therefore, there is need to conduct a comprehensive study with focused groups discussion (FGD) to make concrete conclusions effectively. To acquire a deeper understanding of the objectives of this

study, it is crucial to be aware of the methodological limitations and to supplement qualitative research with quantitative research or mixed-methods techniques. Researchers can provide a more thorough and nuanced assessment of the pottery industry by fusing qualitative insights with more extensive quantitative data. Moreover, future research could also be conducted in different contexts, highlighting the preparedness strategies and action plans for the development of pottery industry.

Competing interest:

The authors declare that they have no competing interest.

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Exploring Conflict Dynamics and Management in the Telecommunication Industry in Bangladesh: A Qualitative Approach

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Abstract

The objectives of this paper are to identify the key sources and manifestations of conflict among stakeholders within the telecommunication industry of Bangladesh, and to explore the strategies and approaches employed for conflict management and resolution within the industry. This research employs a qualitative approach to achieve these objectives. Employing the interpretive paradigm, this method contributes to both the exploration and confirmation of key variables. Data were collected from 20 respondents using focus group discussions and in-depth interviews, employing purposive sampling techniques. Thematic analysis was used for data analysis. The study uncovered sources of conflict arising from interactions between employees and management, as well as the methods employed to manage conflict within the industry and their implications. The outcomes of this study may help practitioners identify appropriate conflict management styles. Additionally, this research could make a substantial contribution to existing literature by aiding future scholars in further research on organizational conflict and its management.

Key words: Conflict, Conflict Management, Conflict Management Strategies, Telecommunication Industry

1. Introduction

Conflicting situations are common in the social system while at least two social entities, like individuals, groups, organizations, and many more, interact with each other and perceive incompatible or inconsistent for reaching their targets. The theme of conflict has immense influence on social phenomena. Consequently, a handful of social scientists have been engaged with this research arena for a long time. Different scholars, such as political scientists,

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economists, sociologists, and biologists have examined conflicts in their own field of study. Despite the debate on the existence of conflict in the organizations, there is obvious a consensus that conflict must be perceived. Moreover, some major commonalities of conflict terms are opposition, scarcity, blockage, and the assumption that goals appear to be incompatible. Additional criteria of conflict existence may be intent, overt act, and manifest fighting or open struggle (Robbins, 1990).

The development of a body of knowledge focused on conflict has been made in the last couple of decades ago. It is almost in the years of the last decade of the twentieth century; conflict related research has been focused on organizational contexts. Literature of the last century shows that conflict creates two probable opposing outcomes, either functional or dysfunctional, in the organizations. A blend and authentic observation of conflict express that it has both productive and destructive influences on organizational system (Jehn, 1997; de Dreu & van de Vliert, 1997; Kelly & Kelly, 1998; Pelled et.al. 1999). Their research suggests that when conflict is beneficial to the organization, the adverse impact must be declined and progressive effects are being increased (Rahim, 2001). The study of organizational conflict and its management are equally important for managers, practitioners, policy makers, and the concerned scholars in knowing the nature of organizational behavior and conflict processes. Traditional organization theorists recognized that conflict as adverse and detrimental to the organization and elimination is essential (Litterer, 1966, p. 178). Traditionalists support the same philosophy, while behaviorists accept the existence of conflict which is inevitable in organization and recognize that it has positive effect on organizational effectiveness. The latest view on organizational conflict is as like the interactionist' philosophy as pluralist theory (Rahim, 2001). The interactionist argues that a certain volume conflict is necessary for the potentiality of the organization and a moderate level of conflict brings functional outcomes rather than breakdown in social relationships. At present, organizational conflict is established as mandatory and positive indicator for effective organizational management.

Presently, managing modern and complex organizations effectively, potential managers must be concerned about conflicting issues and its careful handling. Recently, bountiful researches noted that conflict management has intense impact on organizationaleffectiveness. The middle and top managers are robustlyenvisionedon learning the strategies for preventing and managing conflict in their organizations (Thomas & Schmidt, 1976; Rahim, 2001). Managers employ almost twenty percent dealing time for managing organizational conflicts (Chan et al., 2008; Schermerhorn et al., 1998). Scholars claim that poor conflict

management undermines human relations and productivity of the organizations (Tjosvold & Chia, 1988). Truly, conflict management strategies have been the center of substantial research for periods.

In Bangladesh, the telecommunication industry plays a vital role in driving economic growth, connecting communities, and facilitating communication across various sectors. However, like any dynamic industry, the telecommunications sector is not immune to conflicts and challenges that can arise from diverse stakeholders, including employees, management, customers, and regulatory bodies. Conflict within the telecommunications industry can stem from various sources, such as resource allocation, interdepartmental competition, differences in work culture, or divergent goals and priorities. These conflicts, if left unaddressed or mismanaged, can have detrimental effects on organizational effectiveness, employee morale, and overall performance.

Despite the significance of conflict management in maintaining a healthy and productive work environment, there is a notable gap in understanding the specific dynamics of conflicts within the Bangladeshi telecommunication industry and the effectiveness of current conflict resolution strategies. While some studies have examined conflict management in other industries or global contexts, there is a lack of research that focuses specifically on the telecommunications sector in Bangladesh. Therefore, this study aims to fill this gap by undertaking a qualitative exploration of conflict dynamics and management strategies within the Bangladeshi telecommunications industry. By employing a qualitative approach, the study seeks to uncover the underlying sources of conflict, understand the various manifestations of conflict, and assess the effectiveness of existing conflict management practices. The insights gained from this research will not only contribute to the academic understanding of conflict management but also provide practical recommendations for improving conflict resolution processes within the telecommunication industry in Bangladesh, thereby fostering a more harmonious and productive work environment.

2. Literature Review

The primary motivation for a significant portion of the literature on conflicts is the attainment of organizational goals (Robbins, 1974). Conflict is regarded as an unavoidable consequence of the structural differentiation in the societal organization of industry (Beres & Schmidt, 1982). Managers and subordinates have conflicting and incompatible interests due to this differentiation (Miller & Form, 1980). Corwin (1969) has investigated the correlation between organizational conflict and other elements in his research. The factors encompassed in this context are structural differentiation, participation in the authority system, regulating

procedures, heterogeneity and stability of personnel, and interpersonal structure. He has discovered that organizational conflict was linked to factors such as size, specialization, hierarchy, complexity, staff additions, and heterogeneity. Conversely, involvement in the process of making decisions and the unity of peer group interactions were discovered to promote conflict. Furthermore, he has noted that both experience and careful supervision are crucial factors. Ma et al. (2008) and Caputo (2019) conducted separate bibliographic analyses to examine the research patterns in conflict management. Ma et al. (2008) have focused on the period from 1997 to 2006, whereas Caputo examined the period from 2007 to 2017. The latest study has identified five essential areas that contribute to the monitoring of conflict management research trajectory, namely negotiation, mediation, trust, conflict management styles, and performance. Pruitt (1983) introduced a two-dimensional framework that differentiates between self-concern and concern for others. Nevertheless, this paradigm fails to recognize compromising as an independent style. Pruitt and Carnevale (1993) have identified problem-solving as a highly successful strategy for managing conflicts. Nevertheless, the majority of research on this subject has been carried out in controlled laboratory environments and has generally concentrated on its influence on work performance, productivity, and organizational efficiency.

Blake and Mouton (1964) first described five modes (as strategies or styles, such as forcing, withdrawing, smoothing, compromising, and problem solving) into two dimensions- concern for production and for people- for handling interpersonal conflicts based on the managers' attitudes. Thomas (1976) re-explained the idea of Blake and Mouton (1964) by reflecting the intentions of a party (cooperativeness- the state for satisfying the other party's interests; and assertiveness-endeavoring to gratify one's own interest) for managing perceived conflict.

Prior studies have consistently shown that cooperative conflict management styles tend to have positive outcomes in organizational settings (Meyer, 2004; Weider-Hatfield & Hatfield, 1996), while distributive styles typically lead to negative outcomes (Pruitt & Carnevale, 1993; Weider-Hatfield & Hatfield, 1996). There is much evidence indicating that the conflict management styles of managers are closely connected to the level of job satisfaction among their subordinates (Blake and Mouton, 1964; Thomas & Kilmann, 1978). Alexander (1995) found strong positive correlations between the collaborative approach and job satisfaction. Erkutlu and Chafra (2015) found a favorable correlation between the compromising style and employee satisfaction with their superiors. In addition, the research conducted by Rahim and Buntzman (1989) has found a significant correlation between the integrating style of supervisors and the level of attitudinal

and behavioral conformity, as well as satisfaction with the supervisor. According to Yang (2012), cooperative approaches of management have been found to enhance trust in managers. When organizational partners are interdependent, employing a cooperating method can promote extended cooperation (Weider-Hatfield & Hatfield, 1996). Furthermore, the utilization of cooperative conflict management techniques has a beneficial impact on both organizational creativity and team effectiveness (Chen et al., 2005; Chen & Tjosvold, 2002).

Previous research has revealed that cooperative conflict management tactics, or styles, are associated with favorable employment outcomes, including managerial satisfaction (Alexander, 1995), trust in leaders (Yang, 2012), and organizational fairness (Chen et al., 2005). Furthermore, it is anticipated that cooperative methods, such as integrating, obliging, and compromising, which prioritize the satisfaction of others' concerns, will result in elevated levels of organizational performance.

Sharma and Singh (2019) assert that the body of research on organizational success is extensive and characterized by a wide range of perspectives. They have also contended that more than fifty years of research demonstrate diverse understandings regarding organizational efficiency. Surprisingly, the concept of organizational performance remains uncertain and prone to change over time (Fischbacher-Smith, 2014). Researchers have not reached a unanimous agreement on the precise meaning of organizational success throughout history, spanning from earlier periods to the present. The disparities also surpass in the quantification of organizational efficiency (Henri, 2004). The authors mentioned, Connolly et al. (1980), Campbell (1977), and Mishra and Misra (2017), argue that organizational effectiveness is an intangible and theoretical term that cannot be defined or quantified.

The lack of clarity in assessing the organizational success of non-profit organizations has been noted (Croucher et al., 2018; Mitchell, 2013). Nevertheless, by a thorough examination of the contrasting viewpoints about the definitions and measurement of organizational success, this study has acknowledged that the criteria are substantiated by the underlying theory and models. Research on organizational behavior indicates that factors such as leadership, conflict, communication, structure, and technology have an impact on organizational success. These factors are important for understanding and measuring organizational effectiveness (Rahim, 2001). This research aims to investigate the importance of designing a conflict management program that promotes double-loop organizational learning. Double-loop learning involves making changes to the underlying policies, assumptions, and goals for problem diagnosis and

intervention, as well as cognitive and behavioral changes that go beyond the current paradigm. This type of learning has a significant impact on organizational effectiveness.

There are four well-known models in literature that describe organizational effectiveness: goal accomplishment, system resource, internal process, and strategic constituencies. Rahim (2001) has conceptualized these approaches in his seminal and revolutionary book “Managing Conflict in Organizations”. Goal attainment model refers to evaluate organizational effectiveness in terms of results. This is most popular with management practitioners and researchers. Productivity or efficiency is the most frequent measure of goal attainment. Other popular measures are return on equity, return on assets, and earnings per share. Systems Resource model implies the ways for the achievement. This model focuses on the inputs rather than outputs, which is concerned with the organizational ability of advantageous bargaining positions to obtain necessary resources from the environment. Based on the system resource philosophy, the highly effective organization implies its high capability of acquiring the necessary resources. Internal Process model advocates the internal organizational process, like commitment, trust, interpersonal relationships, communication, motivation, information diction, and so on (Likert, 1967). This approach provokes that the largerscopeof organizational process increases organizational effectiveness. Constituenciesare concerned with the extent to which an organization can satisfy its stakeholders, such as owners, employees, customers, suppliers, government officials and so on. Sharma and Singh (2019) have added a more comprehensive and unified model towards bridging the gapfor measuring organizational effectiveness.

The literature review delves into previous research on conflict dynamics and management strategies, emphasizing studies relevant to the telecommunication industry globally and within Bangladesh specifically. It explores various theories and frameworks used to understand conflicts, such as social identity theory, intergroup conflict theory, and conflict resolution models. Key topics discussed include the sources and causes of conflict within organizations, including issues related to communication breakdowns, resource allocation, leadership styles, and organizational culture. The review also examines the different approaches to conflict management and resolution, ranging from traditional methods like negotiation and mediation to more contemporary strategies such as collaborative problem-solving and alternative dispute resolution techniques. Furthermore, the literature review may highlight the unique challenges and opportunities for conflict management within the telecommunication industry, considering factors such as

rapid technological advancements, market competition, regulatory constraints, and cultural dynamics prevalent in Bangladesh. Overall, the literature review sets the stage for the current study by synthesizing existing knowledge on conflict dynamics and management in the telecommunication industry, identifying gaps or areas needing further exploration, and providing a theoretical framework for understanding the phenomena investigation.

3. Methodology

This study employs a qualitative approach to obtain the set objectives. Understanding human ideas, behavior, attitudes, and perceptions of particular social or non-social issues within their own contextual circumstances is the goal of qualitative research. The open-ended questions used in qualitative research methods encourage participants to freely express their opinions and beliefs. The goal of qualitative research is to comprehend not just "what" but also "why" individuals believe the way they do. In their responses, participants describe the reasoning behind their choices and beliefs, and qualitative research technique analyzes the resulting data to produce generalizable findings for a broader group of comparable types. Social sciences like sociology, anthropology, and psychology have a significant influence on qualitative research. As a result, it enables the researcher to delve deeply into the data collection process and look for as much qualitative data as they can without restrictions on the questions they ask and the responses they receive from the participants.

Researchers have selected four leading wireless telecom operating companies, popularly known as Grameenphone (GP), Robi, Banglalink, and Teletalk. These organizations have occupied the market share in telecommunication industry of Bangladesh. The study collected primary data using in-depth interviews (IDIs) technique from 5 respondents who are paid employees of the companies. Moreover, this study also employed focus group discussion (FGD). This study has conducted 3 different FGDs including employees of different departments in the telecommunication industries. The respondents of the study are pertinent to the study's objectives. All the respondents are directly or indirectly related to the companies' management into telecommunication industry of Bangladesh. The information gathered from the respondents is rich in quality due to their deep knowledge in the respective fields, and interviews have been administered face-to-face. The sample 5 (respondents) of this study was selected purposefully so that the researcher can gather required information which are relevant to the study topic. The respondents of the study were asked open-ended semi-structured questions to gather relevant information about the employees working conditions, workload, working hour, conflict and its management or resolution system, and employees'

job performance as well as companies' performance. All the interviews lasted for almost one hour. The interviews were recorded with the permission of the respondents. Note taking technique was also applied where there was obligation to record the interview session. All the interviews and FGDs protocols have been maintained carefully before starting the interviews and FGDs with the respondents. The demographical profile of the respondents is shown in table 1. The collected interviews and FGDs' data has been analyzed thematically. The themes of this study have been obtained systematically. For example, the interviews were recorded by using audio recorder, the interviews, those were conducted online were also recorded. However, note taking techniques were also applied where there was obligation or limitations to record the interviews and FGD session. Subsequently, the recorded IDIs and FGDs data were transcribed from the beginning to the ends. The transcriptions were carefully read. Then the important issues or key words were coded separately. After receiving the unique codes, the researchers prepared some subcategories using the codes of the interview data. Later, the sub-categories were converted into categories and finally into themes. The data analysis process of this study and demographic profile of the respondents are mentioned in the figure 1 and table 1 respectively.

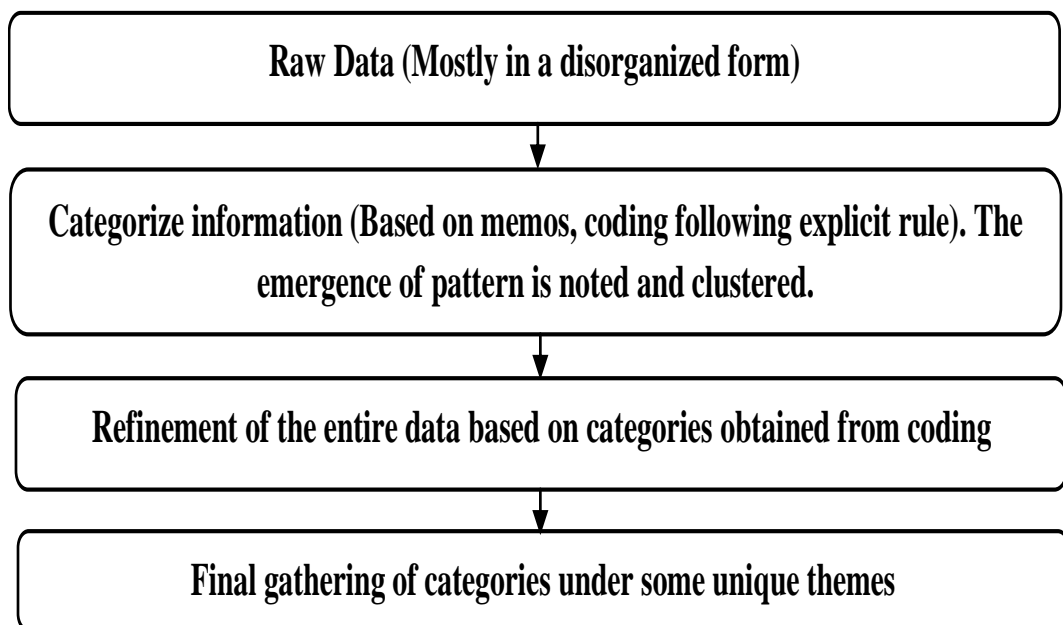


Figure 1: Chronology of Data Analysis Developed by the Researcher

Table 1: Demographic Profile of the Respondents

Sl. No.	Respondents Code	Gender	Age	Job Role	Company	Experience	Education	Date & Time
1	EMP 1	M	42	GM	GP	15 Years	PG	1 Oct. 2022
2	EMP 2	M	48	HRM	TT	20 Years	PG	15 Oct. 2022
3	EMP 3	M	44	HM	BL	10 Years	PG	7 Dec. 2022
4	EMP 4	F	32	CM	Robi	5 Years	PG	8 Dec. 2022
5	EMP 5	M	38	TTM	BL	7 Years	PG	13Nov. 2022
6	FGD 1	M	29	TTM	GP	2 Years	PG	27 Nov. 2022
		M	32	TTM	Robi	4Years	PG	
		M	27	TTM	BL	1 Year	PG	
		F	34	RM	Robi	5 Years	PG	
		M	32	TTM	Robi	4 Years	PG	
		M	35	RM	TT	7 Years	PG	
7	FGD 2	M	42	HRM	GP	10 Years	PG	7 December,2022
		M	45	MLM	GP	15 Years	PG	
		M	49	TTM	GP	18 Years	PG	
		M	47	RM	GP	16 Years	PG	
		M	40	TTM	GP	10 Years	PG	
8	FGD 3	M	55	MLM	BL	12 Years	PG	8 December,2022
		F	45	MLM	BL	9 Years	PG	
		M	37	MLM	BL	5 Years	PG	
		M	41	MLM	BL	8 Years	PG	

Source: Authors

4. Finding and Discussion

The study has considered 5 respondents from diversified levels of positions, age, tenure, region and organizations etc. The respondents are classified according to their professional background. For example, one respondent was from GP, 2 from Banglalink, one from Robi, and one from Teletalk. Apart from these, the respondents are also diversified in accordance with their ages, and tenure. Apparently, the development of Bangladesh economy enormously relies on the telecommunication industry. This is a fastest growing industry in Bangladesh with huge FDI. Nowadays, people cannot put their footstep without telecom services. Surprisingly the nexus of telecom services is making easiest and fastest our daily life. This journey has basically accelerated digital Bangladesh from the last decade of the past century. According to the report of GSMA (2018), worldwide people each other are now more connected through devices and networks. Recently,

telecom corporations have been providing increasingly the cheap and accessible connectivity across the world. In Bangladesh, the story is not different, such as the industry has made its revolutionary earning with four and half billion dollar revenue in 2017 and is contributing 12.7 billion US dollar to the GDP, and showing direct influence on national productivity. GSMA report has also noticed for strategic importance of telecom industry. Bangladesh Government has formulated and executed several policies for influencing the industry's competitiveness and operations of its firms. Bangladesh has own 9th position in the world market in terms of unique mobile subscribers which is above fifty percent of the country's population. International telecom operators have invested their capital in this industry and only one local operator is operating as public limited company with poor performance considering all the aspects of business arena. However, researchers have seen the remarkable growth and contribution of the telecom industry which has generated undoubtedly a big opportunity for the employment in Bangladesh. The industry has been fighting with the internal and external challenges of effective management and to maintain industrial growth and performance collectively as well as individual organizations. Conflict issue and its management are the big challenges for the managers and supervisors at any level of the organizations in telecom organizations.

Study has revealed that the nature of conflict is in the level of interpersonal basically, then intergroup and inter-organizational level conflicts are nominal. However, the main source of conflict is the substantive or task related conflict. The financial target (mainly sales target) of the companies is the big issue for the employees who create mental stress and frustration among the employees of the companies except Teletalk. Beside these, a number of sources of conflict has emerged from the study, such as working process, sales policy, product innovation and development policy, recognition of employees opinion, incentive payment system, response to the problems, communication system, superior behavior and so on. Moreover, researches (Auerbach& Dolan, 1997; Rahim, 2001a) have argued that the common personal factors, for example skills and abilities, personality conflicts, perceptions, diversity, personal problems, are associated with organizational conflicts. Many articles have also claimed that some organizational factors are also common for generating conflicts at work place, such as specialization (Auerbach& Dolan, 1997; Rahim, 2001a), common resources (Rahim, 2001a; Champoux, 2003), goal differences (Champoux, 2003), interdependence (Auerbach& Dolan, 1997; Champoux, 2003), authority relationships (Auerbach& Dolan, 1997), status differences(Auerbach& Dolan, 1997), jurisdictional ambiguities, and roles and expectations(Auerbach& Dolan, 1997). This study has emerged following themes:

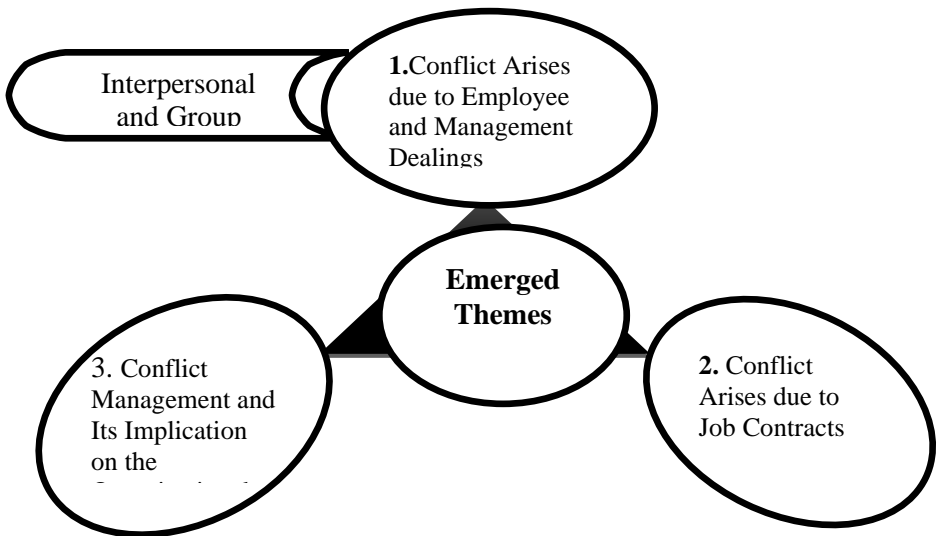


Figure 2: Themes of Conflict Management in the Telco Industry of Bangladesh

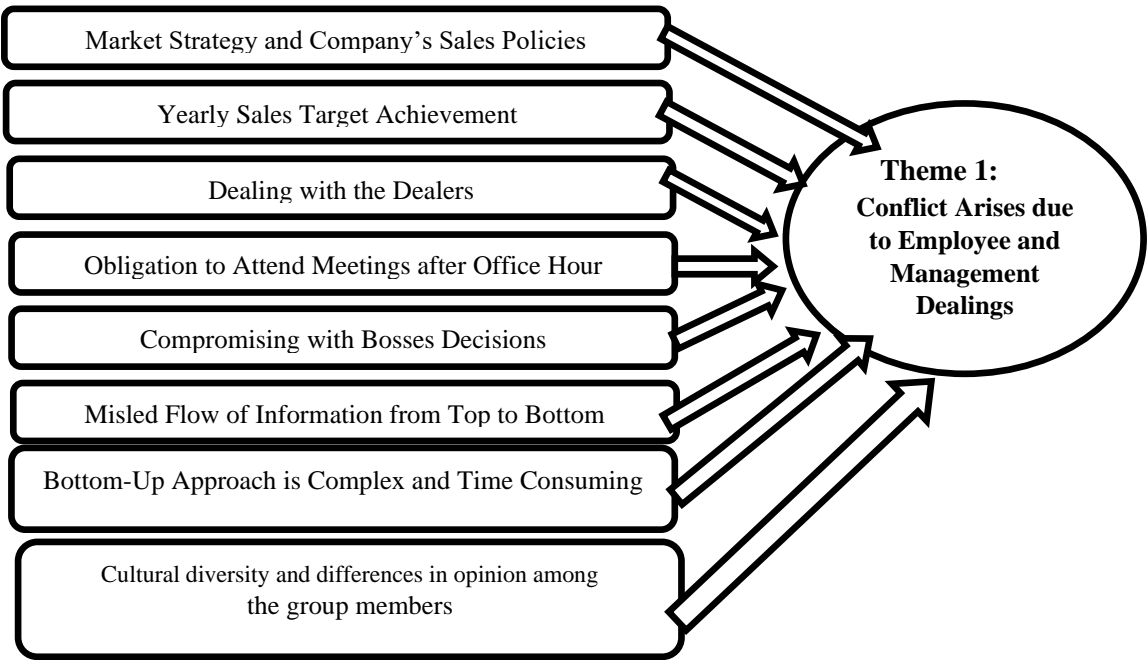


Figure 3: Theme One - Conflict Arises due to Employee and Management Dealings

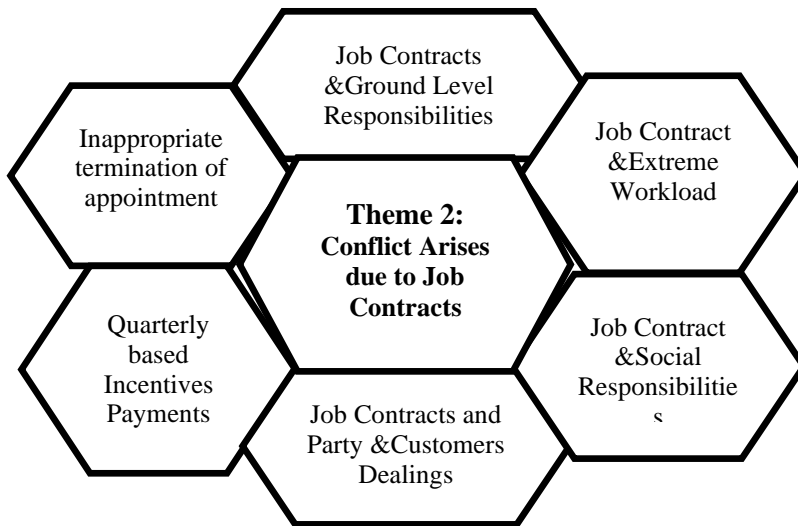


Figure 4: Theme Two- Conflict Arises due to Job Contracts

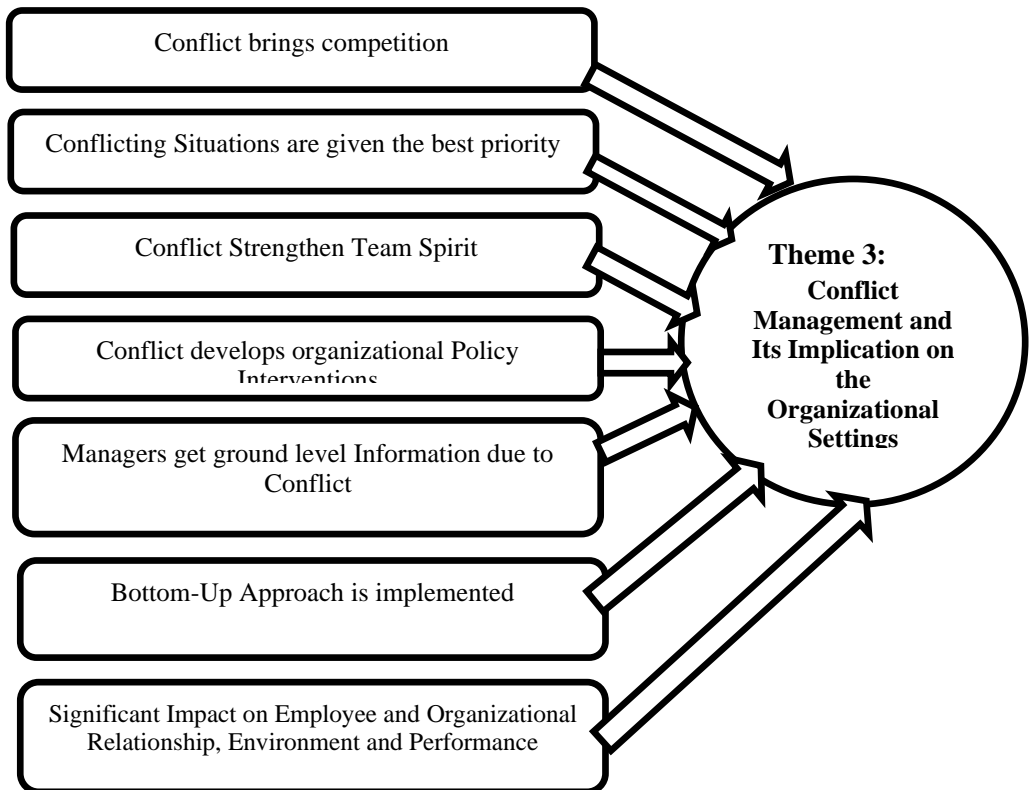


Figure 5: Theme Three-Conflict Management and Its Implication

Some comments of the respondents refer that most of the conflicts are managed in the participatory way through the discussion which denotes the integrating style for conflict management which is called problem solving strategy. Sometimes authority shows the ignoring tendency by avoiding strategy of conflict management. A little application of dominating strategy also is seen in practice for conflict handling. Few respondents have suggested incorporating third party resolution like arbitration or mediation. Respondents also proposed to use the alternative channels for collecting the information of conflicting issues, for example Google form or online software. However, some comments of the respondents are incorporated below:

One of The Teletalk respondents:

“As a Government owned company, it has the social responsibility and obligation to provide services to the customers that’s why Customer care Units (CCUs) necessarily maintain close contact with the people for getting the good impact. When non-govt. companies are closing their CCUs, we cannot do that due to commitment with the citizens. We are more accountable. We are along with the people; we remain in the market directly. For this reason our CCUs remains in the markets. When we raise this issue from the field level, authority can understand that CCUs are important to exist. If needed, financial loss should be recovered from other sources but CCUs should remain. Such this way the conflict is managed/settled”.

He added more, such as-

“Those we are permanent employees, we anticipate our benefits job environment, job responsibilities, descriptions, duties everything written in the appointment letter. So, there is little chance for conflict in these regards. But, conflict basically happens for market strategies. As govt. employee work load, salary structure, other financial benefits what we get those are settled as per govt. pay scale, Company can do nothing. We can say only for additional benefits like incentives, allowances, and mobile bills & convinces etc. There are some conflicts or disagreements on these issues. Say for example, a sales employee work at field level and need talking more. He needs more mobile bill but paid less, which causes conflict sometimes. Similarly, they are paid sales incentive quarterly but feel better if it would be monthly. They inform these issues to the top MGT but not seriously taken.

One of the Banglalink respondent comments:

“In case of workload, at Banglalink it is too high. Though we work in a MNC. Here no problem on incentive payment which is paid quarterly, but our demand monthly”.

Comment from a former Robi employee:

“Almost 6/7 years ago I left Robi that Time Company would paid salary to a fresher, based on my knowledge till date same package is given at entry level. But meanwhile money inflation, price inflation and living costs have increased. As an employee of Telecom Company what package should be paid to me, in reality that amount is not given. This is big obstacle at beginning of the job tenure. Many times monthly payment of incentive issue is unfolded to the authority, but they don't want to pay. Why? I don't understand. If the incentive is paid monthly, it creates good motivation to the work, get attraction to perform the job with more passion”.

A respondent from Robioperator has expressed such as follows:

“Basically, we report to the authority even at night 12.00am or 1.00am. We have no fixed office time. We work even on Friday and Saturday or off days for achieving the target. We accept it. This is our life. Though we want to perform our work in arelax and comfortable way, but not possible. Company sets different target in different times and picks their profit, but at the end of the day we are frustrated. Nothing to do! We have to our work”.

One of the GP respondents has commented as follows:

“Let's see conflict, we don't say conflict rather challenge. For example, I have disagreement that our Dealers or Distributors do not support/cooperate properly. In this case internal expert is appointed to handle the issue. No compromise in regards of service quality. Conflict or challenge whatever it is, when found, tried to manage instantly, even before bringing/occurring the losses. The issues are solved by the immediate boss or internal other expert who has sufficient experience, even from outside the company if needed. Each and everywhere of the company has conflict/challenges which is overcome/managed through discussion, generally in the way of participation. No challenge, no dynamism in the company”.

After analyzing vigorously all the verbatim comments, researchers of this study have emerged above three themes regarding the origin of the organizational conflicts and the management of originated conflicts in the telecom industry of Bangladesh. The distinct observation is that the non-government organizations

manage their conflicts softly in comparison with the government company, like Teletalk. Openness in the organizational culture is one of the remarkable indicators act as a proactive measure for reducing the amount of conflict production. Subsequently, conflict management strategies have been effective for enhancing the organizational effectiveness.

5. Implications

Conflict management practices in the organizational settings limit the negative aspects and enhance the functional outcomes which lead the increase of productivity. So the application of effective conflict management strategies and conflict resolution process improve the employees' job performance as well as organizational performance which is the ultimate means of achieving the predetermined goals of any organization. The implication of this research is that the managers from any organizations may respond to conflict situations differently for the employees' job performance as well as organizational performance. It seems that managers of business organizations may refute the reality of conflict and can deal with it through escaping, dominance, or compromise. This will perhaps clue to groupthink. If this is factual, managers of profit organizations, like telecom companies are in particular need of training in conflict management.

The outcome of this study makes significant contributions to existing literature of organizational conflict. The findings from this study will encourage policy makers and managers in different organizations to build up preeminent styles on how to resolution of conflicts in their organizations; specifically, the policy makers and managers should be in a position to recognize the reasons and consequences of the conflicts of organization in their specialty of organization and then expand suitable styles to the resolution of conflicts at the infancy phase.

The consequences and result of this effort have some recommendations for decision-making practices. *Firstly*, Managers and the policy makers should make suitable styles in resolution conflicts as they take place in their organizations. *Secondly*, management and the policy makers should place the actions and measures to be adopted to solve any conflict which might take place in the organization. *Thirdly*, the actions and measures regarding conflict management should be informed and communicated to all the employees of the organizations. For example, when any differences of opinion will take place in the organization among the employees, it should be mentioned to the management of the organization and then and the policy makers and the management should get policies and statements from the parties concerned, think the matter and provides suggestions on how to make solution of the conflict. *Fourthly*, the result of the solution of the conflict should be obligatory to all members concerned and they

should consign themselves that in future, they will continue to resolve conflicts as they arise amicably. The following verbatim addresses some suggestions handling conflict particularly in the telecom industry in Bangladesh.

“Since the conflict management is an overall matter, so top to bottom all employees should be informed and communicated the problem issues. The right flow of information might help to reduce the conflict. HR department should take the initiatives for addressing the issues with soft mind to ensure the sound relationships in the company for its betterment and prosperity. Consequently, we may get good working place, reasonable workload, etc. Management/authority should arrange effective training on conflict handling skills for the people of the company. So that every person can manage any conflicting situation in the organization. Moreover, Authority might introduce a reasonable stress management system (SMS)”. Statements from the respondent of Teletalk Company.

“Company might involve third party for collecting employees’ disagreement, dissatisfaction and conflict related information. So that authority get real picture on the issues and could take correct measure for resolving/managing conflict”.said the respondent from Banglalink Company.

6. Limitations and Future Research Directions

The major weakness of this study is that it focused on sample size which does not give a comprehensive view on conflicts. Therefore, there is need to conduct a comprehensive study with focused groups discussion (FGD) to make concrete conclusions on organizational conflicts and develop appropriate interventions to manage it effectively. To acquire a deeper understanding of the objectives of this study, it is crucial to be aware of the methodological limitations and to supplement qualitative research with quantitative research or mixed-methods techniques. Researchers can provide a more thorough and nuanced assessment of the conflicts impacting organizational conflict by fusing qualitative insights with more extensive quantitative data. Moreover, future research could also be conducted in different contexts, highlighting the preparedness strategies and action plans of the conflict management in the organizations under study.

7. Conclusion

Results from the study indicate that organizational conflicts exist in telecom organizations of Bangladesh. The major causes of organizational conflicts are workload and target. In fine, Study has revealed that the nature of conflict is in the level of interpersonal basically, then intergroup and inter-organizational level conflicts are nominal. However, the main source of conflict is the substantive or

task related conflict. The financial target (mainly sales target) of the companies is the big issue for the employees who create mental stress and frustration among the employees of the companies except Teletalk. Beside these, a number of sources of conflict has emerged from the study, such as working process, sales policy, product innovation and development policy, recognition of employees opinion, incentive payment system, response to the problems, communication system, superior behavior and so on. Moreover, the common personal factors, for example skills and abilities, personality conflicts, perceptions, diversity, personal problems, are associated with organizational conflicts. Some organizational factors are also common for generating conflicts at work place, such as specialization, common resources, goal differences, interdependence, authority relationships, status differences, jurisdictional ambiguities, and roles and expectations.

Some comments of the respondents refer that most of the conflicts are managed in the participatory way through the discussion which denotes the integrating style for conflict management which is called problem solving strategy. Sometimes authority shows the ignoring tendency by avoiding strategy of conflict management. A little application of dominating strategy also is seen in practice for conflict handling. Few respondents have suggested incorporating third party resolution like arbitration or mediation. Respondents also proposed to use the alternative channels for collecting the information of conflicting issues, for example Google form or online software. The findings underscored the importance of effective conflict management strategies in promoting organizational harmony and fostering sustainable growth in the industry. Recommendations stemming from this research emphasize the need for proactive communication, conflict resolution training, and the establishment of robust mechanisms for addressing conflicts promptly and constructively. Ultimately, this study contributes to a deeper understanding of conflict dynamics in the telecommunications sector and provides valuable insights for industry stakeholders to navigate challenges and cultivate a conducive work environment conducive to innovation and progress.

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Disclosure Statement

The authors announced no possible conflict of interests.

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Assessing BNQF Standards: A Study on Some Selected Universities in Bangladesh

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Abstract

Purpose: The primary aim of this study is to assess adherence to and comprehension of BNQF standards, with the overarching goal of enhancing educational quality within Bangladeshi universities.

Methods: This research adopts an interpretive paradigm and employs inductive reasoning, utilizing in-depth interviews with 30 respondents, including teachers, students, and staff from eight public universities in Bangladesh, selected through purposive sampling. Qualitative methods were chosen to allow interviewees to candidly express their perspectives, emphasizing the identification of key themes.

Findings: This research highlights the importance of fostering an interactive learning atmosphere, promoting active student engagement, ensuring adequate facilities, updating curricula, employing student-centered teaching methodologies, implementing effective assessment strategies, enhancing governance practices, cultivating a research-oriented culture aligned with industry needs, and addressing comprehensive enhancements necessary to elevate the quality of higher education in Bangladesh.

Implications: Based on these findings, institutions can work towards establishing an interactive learning environment that enhances student engagement and prepares them for future endeavors. This research makes a significant contribution to improving quality standards within Bangladeshi universities.

Limitations: This study focuses on a limited sample size to explore rich descriptions and elaborate narratives rather than seeking statistical generalizations. However, this limitation restricts the broader applicability, validity, and comprehensiveness of the conclusions and recommendations presented in the discussion.

Keywords: Quality Education (QE), BNQF, Good Governance, Universities

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1. Introduction

In developing nations worldwide, quality education is a key factor driving continuous economic and social advancement (Huq et al., 2021). A robust higher education system relies on a framework that defines national degree classifications and educational levels based on learning outcomes, along with a minimal academic workload divided into modules. National Qualifications Frameworks (NQFs) have emerged as a global trend, adopted by numerous countries as tools for reform and communication to foster a unified vision of mobility, transitions, and recognition of various forms of learning. Over the past five years, NQF adoption has surged, with approximately 100 nations currently embracing, developing, or considering NQFs, while also engaging in regional qualifications frameworks. Common policy objectives among many nations include elevating skill levels, restructuring education and training systems, and enhancing qualification frameworks (Allais, 2010). The core objective of NQFs is to streamline formal credential requirements, making them more transparent and manageable for individuals navigating transitions (Singh, 2017).

To sustain a nation's higher education system and promote sustainable growth and quality assurance, a national standards framework for higher education institutions in Bangladesh, including universities, is essential. The Bangladesh National Qualifications Framework (BNQF) serves as a tool for delineating, categorizing, and accrediting skills, knowledge, and competencies across agreed-upon levels (BNQF, 2021). Applicable to all higher education institutions—encompassing general, technical, and madrasah institutions—the framework establishes national credential classifications and learning levels based on educational objectives, while stipulating minimum academic requirements and terminology. While quality enhancement remains paramount for higher education institutions, it is equally crucial to understand the importance of benchmarking as a strategy for continuous improvement and competitiveness. Universities worldwide endorse benchmarking principles and innovate transformative methodologies and practices for educational advancement (Tasopoulou & Tsiotras, 2017).

According to UNESCO (2013), "quality assurance" involves a systematic process of evaluating and verifying inputs, outputs, and outcomes against standardized quality benchmarks, aiming to uphold and enhance quality, ensure greater accountability, and facilitate standardization across academic programs, institutions, and systems. Quality education enables students to develop their full range of qualities and talents, realizing their potential both as individuals and contributors to society. It entails identifying desired student improvements and setting high expectations, guiding students to achieve them (Dill, 2007). The

quality of higher education is pivotal for every country's prosperity and development. The World Declaration on Higher Education for the Twenty-First Century states that higher education quality encompasses all functions and activities, including teaching and academic programs, research and scholarship, faculty, students, infrastructure, community services, and the academic environment. Quality assurance and certification in higher education are essential for ensuring educational quality in Bangladeshi universities (Singh, 2013).

Achieving quality education at universities is crucial for any nation, as university students play pivotal roles in shaping the country's future. In Bangladesh, ensuring compliance with international standards among higher education providers is vital for facilitating greater mobility for university students on the global stage. The BNQF has been established to ensure quality education, particularly within the country's universities, providing a standardized framework for recognizing and validating educational and training qualifications. However, the higher education landscape in Bangladesh faces significant challenges in effectively integrating a large number of teachers into BNQF implementation, transitioning towards outcome-based education, and enhancing teachers' professional competencies in teaching, learning, and assessment. Despite the potential benefits of implementing a national qualifications framework, numerous challenges may hinder BNQF evaluation in Bangladesh, as highlighted by Young (2009). These challenges include limited awareness, resource constraints, inadequate alignment with quality assurance, recognition and accreditation standards, trade-offs between accuracy and efficiency, training difficulties, complexity of implementation, and limited applicability. Addressing these challenges is essential to ensure the successful implementation and evaluation of the BNQF in Bangladesh's higher education landscape.

This problem prompts the central question of this study: how can we assess the compliance of BNQF standards at universities in Bangladesh? To address this research question, this study aims to assess the compliance of BNQF standards at universities in Bangladesh, with the goal of enhancing quality. It focuses on identifying the challenges and opportunities associated with implementing these standards. By examining the understanding of BNQF standards at universities where they have been implemented, this study seeks to gauge their impact and assess the understanding at Bangladeshi universities to effectively implement these standards for quality assurance. Ultimately, this study aims to contribute to ongoing efforts to implement standards, fostering improvements in the quality of higher education in Bangladesh.

The rest of this paper is organized as follows: Section two elaborates on the literature review, leading to the identification of the problem statement, research gap, and formulation of research questions. Section three explains the methodological approach of the research. Section four presents data analysis, findings, and discussion. Finally, implications, research limitations, directions for future research, and conclusions are discussed.

2. Literature Review

Conventional approaches to national quality assurance frameworks vary across different countries, typically falling into three main models: the European Model characterized by centralized quality control overseen by state educational ministries, the US model which combines decentralized quality assurance with market competition, and the British model where responsibility for quality assurance is largely delegated to self-accrediting universities (Dill, 2007). A qualifications framework serves as a tool for developing and categorizing qualifications based on specific criteria for levels of learning achieved. These criteria may be implicit in qualifications descriptors or explicitly outlined in the form of level descriptors (OECD, 2007). Frameworks may encompass all learning achievements and pathways or focus on specific sectors such as primary education, adult education and training, or vocational fields. Regardless, all qualifications frameworks provide a basis for enhancing the quality, accessibility, connectivity, and recognition of qualifications within a country or globally. The Bangladesh Accreditation Council oversees the implementation of the BNQF for Higher Education, established as a statutory independent organization under the Bangladesh Accreditation Council Act, 2017, responsible for governing and managing the Framework (BNQF, 2021).

The process of governance, which is defined in written provisions through the board's relationship with interested parties or other procedures, is what guides and regulates the organization. Transparency, accountability, justice, policy, independence, and participation are the metrics used to evaluate governance. The governance framework should be the organization's strategic guidelines, the efficacy of the board of management's oversight of management, and the board of management's accountability to the organization and its owners. The governance work should guarantee that timely and accurate disclosure is expressed in all matters concerning the organization, including the financial circumstances, performance, ownership, and governance (Lin et al., 2021). The administrators of universities find themselves more and more concerned with their managerial responsibilities. Distributed leadership has become popular as a means for administrators to meet corporate management expectations while preserving the

academic community's friendship and cooperation (Lizier, 2024). The emerging standard of educational leadership is defined as "networking, improving educational practices, calmness & compassion, analytical & strategically thinking, and transparency (Yokuş, 2022).

Academic institutions strive for the highest standards of instruction and learning. Academic standards must be protected at all levels of educational institutions by paying attention to quality assurance; ideally, this can be achieved by combining internal quality monitoring with external audits (Glendinning, 2022). Higher education institutions worldwide endeavour to achieve superior quality and standards in all aspects of their operations, with a particular focus on teaching, research, community development, and innovation. The public strongly supports higher education institutions with high standards and quality, and these institutions enjoy a positive reputation around the world (Asiyai, 2020). Learning outcomes and objectives are more frequently evaluated in relation to instruction that is conducted outside of libraries. Since developing learning objectives is typically connected with semester-long courses, it is not unexpected that there is little information available in library literature regarding the procedures and approaches used to develop efficient, quantifiable learning objectives for information literacy instruction sessions (Goss, 2022; James, 2020). A crucial aspect of sustainable development is higher education. By preparing their students to be the future's architects and to be democratic, egalitarian, capable, and environmentally conscious people, universities may play a significant role in fostering a sustainable future (Weiss & Barth, 2019). The most important aspect of the higher education industry is excellent instruction. Due to growing institutional competitiveness and opportunities for worldwide study through a variety of forms, its pursuit has intensified (Harrison, et.al, 2020). The need for education and training on student support service concerns has been highlighted in the context of HEI due to staff members' lack of understanding, and it would be preferable to do so prior to their taking part in the performance assessment (Coutinho et al. 2018).

The Framework underscores standards set by accredited higher education institutions, delineating the knowledge, skills, competencies, and values expected of graduates. Drawing from best practices worldwide, the framework aims to enhance the quality of higher education degrees in Bangladesh and bridge instructional disparities among higher education institutions. The transition towards outcomes-based approaches to credentials and curricula traces back to the 1960s in the United States, initially aimed at assessing teacher competency in response to increasing public scrutiny of school education (Allais, 2010). Since then, numerous countries in the Asia-Pacific region have introduced qualifications

frameworks, primarily focusing on vocational education. The adoption of the European Qualifications Framework (EQF) by the European Union in 2008 spurred European countries to develop comprehensive qualifications frameworks, aiming for enhanced international recognition and transparency of qualifications. Quality assurance in higher education emerged as a distinct regulatory focus in the late 19th century, with the establishment of accreditation agencies in the United States (Brown, 2004). The globalization and massification of higher education have reshaped the traditional state-institution relationship, compelling policymakers to explore new approaches to ensure academic quality. Governance structures in higher education encompass legislative frameworks, institutional characteristics, resource allocation mechanisms, and accountability mechanisms, among others (Henard & Mitterle, 2010). Quality assurance in higher education emerged as a distinct regulatory focus in the late 19th century, with the establishment of accreditation agencies in the United States (Brown, 2004). The globalization and massification of higher education have reshaped the traditional state-institution relationship, compelling policymakers to explore new approaches to ensure academic quality. Governance structures in higher education encompass legislative frameworks, institutional characteristics, resource allocation mechanisms, and accountability mechanisms, among others (Henard & Mitterle, 2010). Ethical considerations in higher education encompass behavioral standards that distinguish between right and wrong conduct (Henderson, 1982). Ethical challenges in student behavior include breaches of regulations, violations of implicit norms or expectations, inappropriate behavior in classrooms or examination halls, and disruptions to teaching and learning. Challenges in collecting questionnaire data from students during research studies may include students' reluctance to disclose unethical behavior, despite efforts to ensure honesty and authenticity in their responses (Jahan, 2021). Qualifications frameworks in the Asia-Pacific Economic Cooperation (APEC) region offer various benefits, including supporting skills development, facilitating educational and labor market mobility, improving access to education and training, enhancing consistency in qualification design, boosting employer confidence in qualifications, and promoting international recognition of qualifications (Allais, 2010).

Despite the significant strides made in implementing qualifications frameworks, including the BNQF for Higher Education, challenges persist in effectively integrating these frameworks into the higher education landscape. While the literature highlights the benefits of qualifications frameworks in enhancing quality, accessibility, and recognition of qualifications, there remains a gap in understanding the specific obstacles encountered during their implementation in

Bangladesh. Additionally, while governance structures and ethical considerations in higher education have been extensively discussed, there is limited research exploring the intersection between governance, ethics, and the implementation of qualifications frameworks. Understanding how governance mechanisms influence the adoption and effectiveness of qualifications frameworks, and the ethical challenges encountered during their implementation, represents an important area for further investigation. Furthermore, the literature underscores the importance of quality assurance mechanisms in ensuring the credibility and consistency of qualifications. However, there is a gap in understanding how quality assurance practices can be effectively aligned with qualifications frameworks, particularly in the context of Bangladesh. Exploring the challenges and opportunities in aligning quality assurance practices with qualifications frameworks could provide valuable insights into enhancing the quality and recognition of higher education qualifications in the country. Therefore, the research gap lies in the need for empirical studies that delve deeper into the challenges faced in implementing qualifications frameworks, the role of governance and ethics in this process, and the alignment of quality assurance practices with qualifications frameworks in the context of Bangladesh's higher education system. Addressing this gap would contribute to a more comprehensive understanding of the factors influencing the successful implementation of qualifications frameworks and inform policy and practice in higher education quality assurance.

3. Methodology

To achieve the research objectives, this study adopted an interpretive paradigm, employed inductive reasoning, and utilized a qualitative approach through in-depth interviews to assess the compliance of BNQF standards at universities in Bangladesh, aiming to enhance quality. The study interviewed relevant respondents directly or indirectly involved in quality assurance and national qualification procedures, using semi-structured questionnaires as part of the qualitative data collection process.

Consistent with the interpretive paradigm, face-to-face, in-depth interviews were conducted to explore issues related to compliance with these standards, their evaluation, and their impacts at universities in Bangladesh. A purposive sampling technique was employed to select 30 participants for in-depth interviews from various public universities. Specifically, the study conducted one interview with a former Vice-Chancellor, six with IQAC Directors, four with academic leaders (Deans), and three with Department Chairs, six with teachers, four with university administrative staff, and six with university students from several public universities.

Before commencing the interviews, the researchers provided respondents with a description of the interview protocols. Upon obtaining their consent, the entire interview session was recorded using a mobile phone's voice recorder. In cases where recording was not permitted, note-taking was used instead. Each face-to-face interview lasted between 35 to 45 minutes. After completing the interviews, the researchers promptly began listening to the voice recordings and transcribing the raw data, a time-consuming and demanding task.

The raw interview data was meticulously coded into individual words or phrases, which were then organized and subcategorized based on their characteristics. These subcategories were sorted into distinct categories, from which the study's topics were derived. Following a thorough data analysis, the study identified four distinct themes that align with its objectives.

The respondents were interviewed as part of a study conducted between March and May 2023. The data includes gender, age, designation, institutional affiliation, professional experience, educational background, and the date and time of the interview. The respondents were grouped into four distinct categories: Faculty Members, Administrative Staff, and Students. The faculty group comprises 20 professors, predominantly male (18), aged 45 to 58, with extensive professional experience ranging from 19 to 37 years. All but one hold a PhD, representing universities like Rajshahi University (RU), Khulna University (KU), and others. Four administrative staff members, aged 42 to 58, include a Registrar, Deputy Registrar, and Section Officers, with experience spanning 17 to 45 years, all affiliated with RU and holding advanced degrees such as MA and MSS. The six student respondents, equally distributed by gender and aged 24 to 26, are enrolled at RU across various undergraduate and postgraduate programs, with academic tenures of 4 to 6 years. This diverse respondent pool offers a balanced perspective from seasoned academicians, experienced administrators, and the student demographic, enriching the study's insights into the university ecosystem in Bangladesh. The following table 1 presents the profiles of the respondents and the themes generated from the thematic data analysis.

Table 1: The Themes

Number	Themes
Theme: 1	Academic Context
Theme: 2	Intellectual Community Culture
Theme: 3	Training and Learning Center
Theme: 4	Good Governance
Theme: 5	Modern Technological and Infrastructure Facilities
Theme: 6	Ethical Context

Source: Developed by Authors

4. Findings and Discussion

Quality assurance in universities is still in its early stages. However, with the passage of the Bangladesh Accreditation Council Act in 2017, significant progress has been made in advancing the quality assurance agenda in universities (Rahman et al., 2019). Several institutions have also implemented internal quality assurance mechanisms and conducted self-evaluations based on feedback from students, teachers, and employers. Outcomes-based qualifications are viewed as a means to drive curriculum reform, transform the management and delivery of education and training systems, and revise the processes and criteria for awarding qualifications, thereby enhancing quality in universities.

Theme 1: Academic Context

Academic activities, interests, and disciplines are those associated with formal education and academic research (Rahman et al., 2019). They encompass various areas of learning, teaching, research, and knowledge dissemination at institutions such as schools, colleges, and universities. Academic institutions also serve as forums for intellectual exchange and collaboration. Scholars frequently engage in discussions, conferences, and joint initiatives with peers and specialists in their fields. These encounters facilitate the exchange of ideas, perspectives, and research findings, thereby fostering a vibrant academic community.

Additionally, academic institutions provide resources and support for study and research. Scholars can access relevant materials, conduct experiments, and gather information through libraries, laboratories, online databases, and other resources. Furthermore, academic organizations often offer grants, scholarships, and fellowships to encourage research and enable academics to pursue their scholarly objectives.

An interactive class is one in which students actively participate and engage with the subject matter, the lecturer, and their peers. Engagement includes discussions, group activities, hands-on exercises, and real-time feedback. In an interactive class, students are encouraged to ask questions, share their perspectives, collaborate with others, and solve problems (Silverthorn, 2006).

“The teacher enhances student involvement and knowledge by integrating interactive teaching methods, technology, and multimedia resources. Interactive courses can be held in-person or online, and they can make use of platforms and tools that enable real-time communication and collaboration.”

Respondent Code: IQAC4; Gender: M; Age: 53; Designation: professor; Institution: KU; Experience: 21; Education: PhD; Interview Date: 25.03.23; 10AM

Respondent Code: IQAC5; Gender: M; Age: 45; Designation: professor; Institution: RU; Experience: 20; Education: PhD; Interview Date: 25.03.23; 2PM

Respondent Code: CH3; Gender: M; Age: 52; Designation: professor; Institution: RU; Experience: 33; Education: PhD; Interview Date: 14.05.23; 3PM

Respondent Code: T3; Gender: F; Age: 48; Designation: professor; Institution: RU; Experience: 28; Education: PhD; Interview Date: 10.03.23; 4PM

In order to become the class interactive, Class size should be reduced. In this regard, an IQAC director commented:

“Student-teacher ratios are often high in universities. The optimum ratio should be 1:30. The delivery of lectures is hampered without suitable classroom facilities, such as speakers and multimedia, making teaching and learning less effective.”

Respondent Code: IQAC5; Gender: M; Age: 45; Designation: professor; Institution: RU; Experience: 20; Education: PhD; Interview Date: 25.03.23; 2PM

Implementing modern practices with updated curriculum in teaching, learning, and assessment by implementing active learning in the classroom and a system for student feedback, student’s assessment and evaluation as well as including higher-order cognitive skills and soft skills development in the curricula and using a learning management system for measuring student learning outcomes (Ali et al. 2017). In this regards, some expert, academic leaders and faculty members Stated:

“Curriculum should be developed and updated with expert viewpoint. Students require an updated curriculum in order to acquire a relevant and complete education that prepares them for the changing demands of the modern world. An updated curriculum considers advances in knowledge, technology, and societal changes, providing students with the skills and information they need to excel in their personal and professional life. It bridges the gap between academic learning and practical application by encouraging critical thinking, problem-solving, creativity, and flexibility.”

Respondent Code: IQAC3; Gender: M; Age: 47; Designation: professor; Institution: SUST; Experience: 19; Education: PhD; Interview Date: 22.03.23; 10PM

Respondent Code: D2; Gender: M; Age: 48; Designation: professor; Institution: RU; Experience: 24; Education: PhD; Interview Date: 15.05.23; 3PM

Respondent Code: T1; Gender: M; Age: 51; Designation: professor; Institution: JU; Experience: 23; Education: PhD; Interview Date: 17.03.23; 9PM

Respondent Code: T4; Gender: M; Age: 55; Designation: professor; Institution: CU; Experience: 37; Education: PhD; Interview Date: 15.03.23; 10PM

The traditional and inflexible approach to teaching, learning, and evaluation methods, Teaching and Learning Pedagogy, inhibit successful student learning.

Classroom education mostly emphasizes rote learning, non-creativity, and student passivity, which impedes the development of higher-order critical thinking and soft skills (Alam, 2020). Regarding this, an IQAC director commented:

“Universities work hard to establish an interactive and inclusive learning atmosphere that encourages analytical thinking, creativity, and in-depth knowledge. To stimulate active involvement and knowledge development, lectures, debates, group work, and experiential activities are frequently used following the BNQF framework.”

Respondent Code: IQAC2; Gender: M; Age: 50; Designation: professor; Institution: RU; Experience: 24; Education: PhD; Interview Date: 19.03.23; 2PM

Also regarding this issue, a former Vice-Chancellor commented:

“A student-centered approach is at the heart of university teaching and learning practice. Faculties try to create accessible and engaging educational environments by taking into account students' various cultures, passions and learning styles. They promote active involvement, collaborative learning, and knowledge application in real-world scenarios.”

Respondent Code: FVC1; Gender: M; Age: 58; Designation: professor; Institution: KU; Experience: 30; Education: PhD; Interview Date: 09.04.23; 4PM

Learning is mostly assessed through written tests, with minimal opportunity for learners to get feedback other than traditional grades. Some institutions have taken proactive initiatives to develop active learning approaches, which have been linked to greater levels of student satisfaction with teaching-learning. Inadequate and conventional teaching and learning facilities offer a substantial barrier to providing effective education. Observations made by experts and academic leaders stated:

“Universities try to develop students' analytical and critical thought, research skills, and habits of lifelong learning following the BNQF framework. Assignments, projects, and continuous assessment exams are intended to stretch students, foster autonomous investigation, and enhance knowledge application in real-world scenarios. When students have little or no access to raw materials and lab facilities, the quality of practical learning suffers, particularly in science, technology, engineering, and mathematics education.”

Respondent Code: IQAC5; Gender: M; Age: 45; Designation: professor; Institution: RU; Experience: 20; Education: PhD; Interview Date: 25.03.23; 2PM

Respondent Code: IQAC6; Gender: M; Age: 56; Designation: professor; Institution: RU; Experience: 35; Education: PhD; Interview Date: 16.03.23; 10AM

Respondent Code: D1; Gender: M; Age: 57; Designation: professor; Institution: RU; Experience: 28; Education: PhD; Interview Date: 14.05.23; 2PM

Respondent Code: D3; Gender: M; Age: 57; Designation: professor; Institution: HSTU; Experience: 24; Education: MBA; PGD; Interview Date: 11.03.23; 3PM

Furthermore, access to high-quality Internet connectivity and digital resources is limited. Even if these resources are well-provided, digital literacy among instructors and students remains low, resulting in limited use of digital facilities in teaching and learning.

Theme 2: Intellectual Community Culture

A research-based culture fosters inquiry, creativity, and critical thinking. It prioritizes knowledge acquisition, evidence-based decision-making, and lifelong learning. This culture encourages collaboration, open communication, and the exchange of ideas, facilitating the generation of new insights and discoveries (Cheetham, 2007). By addressing complex issues with evidence-based solutions, it promotes intellectual growth, drives advancements across various sectors, and contributes to social progress.

However, the proportion of research grants in public funding for universities has remained stable, at significantly below 1%. Research facilities, including modern laboratories, equipment, and digital resources, are still inadequate, hindering academics from conducting and producing high-quality research (Rahman et al., 2019). In this regard, IQAC experts and faculty members commented:

“University research has been badly underfunded, impacting their ability to do knowledge work despite the fact that universities have a large number of professors with advanced degrees and research expertise.”

Respondent Code: IQAC2; Gender: M; Age: 50; Designation: professor; Institution: RU; Experience: 24; Education: PhD; Interview Date: 19.03.23; 2PM

Respondent Code: IQAC4; Gender: M; Age: 53; Designation: professor; Institution: KU; Experience: 21; Education: PhD; Interview Date: 25.03.23; 10AM

Respondent Code: IQAC5; Gender: M; Age: 45; Designation: professor; Institution: RU; Experience: 20; Education: PhD; Interview Date: 25.03.23; 2PM

Respondent Code: CH1; Gender: M; Age: 53; Designation: professor; Institution: RU; Experience: 26; Education: PhD; Interview Date: 28.03.23; 5PM

Respondent Code: T1; Gender: M; Age: 51; Designation: professor; Institution: JU; Experience: 23; Education: PhD; Interview Date: 17.03.23; 9PM

Respondent Code: T2; Gender: M; Age: 55; Designation: professor; Institution: RU; Experience: 32; Education: PhD; Interview Date: 18.03.23; 10PM

Respondent Code: T4; Gender: M; Age: 55; Designation: professor; Institution: CU; Experience: 37; Education: PhD; Interview Date: 15.03.23; 10PM

Respondent Code: SF1; Gender: M; Age: 58; Designation: Register; Institution: RU; Experience: 45; Education: MA; Interview Date: 07.05.23; 12PM

There is a significant pool of Bangladeshi academics with PhDs, many of whom were trained overseas and are primarily concentrated in major public universities, indicating that Bangladesh has untapped research potential. In academia, research is extremely important. Scholars do research in order to develop new information, enhance current knowledge, and advance their particular subjects. This includes developing research questions, devising experiments, collecting and analyzing data, and publishing or presenting findings in academic publications or at conferences (Elton & Laurillard, 1979). Regarding this issue, some IQAC expert and faculties commented:

“Universities place a high priority on the construction of research centers, institutes, and labs that provide cutting-edge facilities and technology. They also urge faculty members to participate in research initiatives, seek external financing, and publish their findings in peer-reviewed publications. They actively encourage student engagement in research by providing undergraduate and graduate students with opportunity to engage in research initiatives, internships, and support from mentors.”

Respondent Code: IQAC4; Gender: M; Age: 53; Designation: professor; Institution: KU; Experience: 21; Education: PhD; Interview Date: 25.03.23; 10AM

Respondent Code: T2; Gender: M; Age: 55; Designation: professor; Institution: RU; Experience: 32; Education: PhD; Interview Date: 18.03.23; 10PM

Respondent Code: SF2; Gender: M; Age: 55; Designation: Deputy Register; Institution: RU; Experience: 26; Education: MA; Interview Date: 07.05.23; 2PM

Critical Thinking and systematic innovative work conducted to grow the store of information, including understanding of mankind, culture, and society, and the use of this knowledge to design new applications (Cheetham, 2007). In this regards, an IQAC director and a faculty member who have pursue degree in foreign and have huge experience, commented:

“University students' critical thinking skills are developed through a variety of academic activities such as research assignments, essay writing, group debates, and problem-solving exercises. By stimulating intellectual curiosity and questioning existing assumptions, university education frequently develops an environment that encourages critical thinking. Students are encouraged to participate in discussions, challenge authority, and investigate novel solutions to society issues.”

Respondent Code: IQAC5; Gender: M; Age: 45; Designation: professor; Institution: RU; Experience: 20; Education: PhD; Interview Date: 25.03.23; 2PM

Respondent Code: T4; Gender: M; Age: 55; Designation: professor; Institution: CU; Experience: 37; Education: PhD; Interview Date: 15.03.23; 10PM

Theme 3: Training and Learning Center

The university's Training and Learning Center provides essential tools and support for students, teachers, and staff seeking to enhance their skills and knowledge. It offers a variety of training programs, workshops, and seminars to assist individuals in their professional and academic development. Faculty members are nominated by the dean's office at their respective schools or colleges to teach the core courses of the certificate program. They receive a small stipend and participate in a training session to prepare for this role (Gunersel & Etienne, 2014).

The Training and Learning Center promotes a collaborative and interactive learning environment where individuals can engage in hands-on activities, gain practical experience, and acquire new skills. It fosters a resourceful atmosphere for students to enhance their abilities, learn new concepts, and develop their talents (Raqib, 2019). The center aims to empower students to succeed in their academic pursuits and prepare them for the challenges of the professional world through a diverse range of workshops, seminars, and training programs. With its skilled instructors and resources, the center creates a supportive and interactive learning environment that encourages collaboration, critical thinking, and creativity. In this context, many experts, academic leaders, and faculty members commented:

“Undoubtedly, there is no training and learning center for university teacher. For that reason, they are unable to enhance pedagogical skills, promote effective teaching methods, or keep educators up to date on the newest trends and advancements in their particular professions.”

Respondent Code: FVC1; Gender: M; Age: 58; Designation: professor; Institution: KU; Experience: 30; Education: PhD; Interview Date: 09.04.23; 4PM

Respondent Code: IQAC2; Gender: M; Age: 50; Designation: professor; Institution: RU; Experience: 24; Education: PhD; Interview Date: 19.03.23; 2PM

Respondent Code: IQAC4; Gender: M; Age: 53; Designation: professor; Institution: KU; Experience: 21; Education: PhD; Interview Date: 25.03.23; 10AM

Respondent Code: IQAC5; Gender: M; Age: 45; Designation: professor; Institution: RU; Experience: 20; Education: PhD; Interview Date: 25.03.23; 2PM

Respondent Code: D3; Gender: M; Age: 57; Designation: professor; Institution: HSTU; Experience: 24; Education: MBA; PGD; Interview Date: 11.03.23; 3PM

Respondent Code: CH2; Gender: M; Age: 54; Designation: professor; Institution: RU; Experience: 24; Education: PhD; Interview Date: 11.03.23; 12PM

Respondent Code: CH3; Gender: M; Age: 52; Designation: professor; Institution: RU; Experience: 33; Education: PhD; Interview Date: 14.05.23; 3PM

Respondent Code: T1; Gender: M; Age: 51; Designation: professor; Institution: JU; Experience: 23; Education: PhD; Interview Date: 17.03.23; 9PM

Respondent Code: T3; Gender: F; Age: 48; Designation: professor; Institution: RU; Experience: 28; Education: PhD; Interview Date: 10.03.23; 4PM

Respondent Code: T4; Gender: M; Age: 55; Designation: professor; Institution: CU; Experience: 37; Education: PhD; Interview Date: 15.03.23; 10PM

Expert teachers in universities possess a high level of knowledge and mastery in their respective fields. These teachers have extensive academic and professional experience, enabling them to provide valuable insights and practical applications. Their expertise also extends to designing curriculum, conducting research, and mentoring students, fostering a supportive learning environment. Through their passion for teaching and commitment to student success, expert teachers in universities play a pivotal role in shaping the minds of future generations. Observation made by an IQAC director stated:

“Qualified teachers are few, and there are little possibilities for professional growth. Teacher vacancies are common in universities particularly in district towns and rural regions.”

Respondent Code: IQAC5; Gender: M; Age: 45; Designation: professor; Institution: RU; Experience: 20; Education: PhD; Interview Date: 25.03.23; 2PM

For public universities, the government should use a central teacher recruiting and training procedure that can take up to two years, and turnovers during this period worsen the vacancy problem.

Theme 4: Good Governance

The legislative backbone and coordinating mechanism of university education are fragmented. The three subsectors are governed by different legal frameworks, each establishing distinct governance structures, duties, and obligations for various institutions. The large number of organizations, complex governance structures, and weak managerial capacity make effective administration and coordination at both the central and institutional levels challenging.

Good governance is a vital foundation for a well-functioning society and is critical to a nation's progress, stability, and prosperity. It encompasses the principles and practices in the governance process that promote transparency, accountability, participation, efficiency, and the rule of law (Alam, 2020). Transparency is an essential component of effective governance, as it allows the public access to information and decision-making processes. Transparent governance enables citizens to hold their leaders accountable and fosters trust in public institutions. It also helps prevent corruption, as politicians and institutions are more likely to act ethically when their actions are subject to public scrutiny (Rahman et al., 2019).

“Poor transparency and insufficient accountability systems are to blame for numerous abnormalities bad practices in the universities, such as teacher recruitment, student enrolment, and student assessments. In the absence of effective accountability systems, governmental constraints constrain institutions' ability to respond to human resource demands and academic program modifications.”

Respondent Code: FVC1; Gender: M; Age: 58; Designation: professor; Institution: KU; Experience: 30; Education: PhD; Interview Date: 09.04.23; 4PM

Respondent Code: IQAC3; Gender: M; Age: 47; Designation: professor; Institution: SUST; Experience: 19; Education: PhD; Interview Date: 22.03.23; 10PM

Respondent Code: IQAC4; Gender: M; Age: 53; Designation: professor; Institution: KU; Experience: 21; Education: PhD; Interview Date: 25.03.23; 10AM

Respondent Code: IQAC5; Gender: M; Age: 45; Designation: professor; Institution: RU; Experience: 20; Education: PhD; Interview Date: 25.03.23; 2PM

Accountability is yet another critical component of successful government. It means that people in positions of authority must account for their acts and decisions. Effective measures should be in place to hold public officials accountable for their actions and to guarantee that they operate in the best interests of the people they represent. This may be accomplished by establishing independent judicial systems, strong anti-corruption laws, and monitoring agencies (Rahman et. al, 2019). Observation made by a former Vice-Chancellor commented:

“Public university teachers get so much freedom and autonomy to conduct their daily work. Furthermore, the highly politicized climate in universities frequently leads to student and staff protests and disruptions that disrupt the academic schedule.”

Respondent Code: FVC1; Gender: M; Age: 58; Designation: professor; Institution: KU; Experience: 30; Education: PhD; Interview Date: 09.04.23; 4PM

Governance efficiency ensures that resources are used effectively and services are delivered efficiently. This includes reducing bureaucratic processes, encouraging digital transformation, and putting in place strong systems for managing public finances. Efficient governance optimizes service delivery and maximizes the effect of public resources, resulting in better outcomes for residents (Kooli, 2019).

Theme 5: Modern Technological and Infrastructure Facilities

Universities face a significant lack of modern technology and infrastructure facilities, including computer laboratories, high-speed internet access, digital libraries, smart classrooms, and campus-wide Wi-Fi coverage. These facilities are

essential for providing students with access to cutting-edge research, collaboration, and learning tools and resources (Bariu, 2020).

To create a suitable and engaging learning environment, colleges also invest in contemporary infrastructure, such as well-designed lecture halls, research centers, sports facilities, and student housing. These amenities enhance the overall educational experience, foster innovation and creativity, and prepare students for the demands of the digital age. In this regard, some IQAC experts commented:

“The government should increase fund and may propose particular incentives for modern technological and infrastructure facilities in order to improve quality in education and collaboration with foreign universities through blended online learning. Increasing investments in teaching and learning, as well as ICT facilities, potentially through government support, private-sector collaborations and fundraising and outreach campaigns. It is also a most important task to focus on this issue. University authority should prioritize on computer laboratories, high-speed internet access, digital libraries, smart classrooms, and campus-wide Wi-Fi coverage are among them”

Respondent Code: IQAC1; Gender: M; Age: 52; Designation: professor; Institution: JnU; Experience: 33; Education: PhD; Interview Date: 17.03.23; 10PM

Respondent Code: IQAC5; Gender: M; Age: 45; Designation: professor; Institution: RU; Experience: 20; Education: PhD; Interview Date: 25.03.23; 2PM

Respondent Code: IQAC6; Gender: M; Age: 56; Designation: professor; Institution: RU; Experience: 35; Education: PhD; Interview Date: 16.03.23; 10AM

Respondent Code: T2; Gender: M; Age: 55; Designation: professor; Institution: RU; Experience: 32; Education: PhD; Interview Date: 18.03.23; 10PM

Respondent Code: T3; Gender: F; Age: 48; Designation: professor; Institution: RU; Experience: 28; Education: PhD; Interview Date: 10.03.23; 4PM

There is a huge lack of modern technological facilities, such as modern and smart library facilities, better Wi-Fi facilities, and others modern equipment for practical work in lab and a greater lack of proper monitoring of previously established labs (Walmiki & Ramakrishnegowda, 2009).

Theme 6: Ethical Context

In academic endeavors, teachers and students should adhere to the highest ethical standards. They must be honest, trustworthy, and fair in every aspect of teaching and learning. Teachers should foster a supportive environment that respects each student's rights and dignity. Students should be encouraged to take ownership of their own learning and to respect their professors, peers, and the educational process as a whole. In conducting research or grading assignments, they should

promote academic integrity, avoid plagiarism, and follow ethical guidelines. Overall, university instructors serve as role models, consistently demonstrating ethical behavior and upholding educational and professional principles (Jahan, 2021). University faculty and staff support their students' well-being and academic success by creating an inclusive and welcoming learning atmosphere. They maintain confidentiality and professionalism while ensuring that all students receive equal treatment and opportunities.

“Teachers in universities have a primary responsibility to uphold and exemplify ethical behavior in all of their relationships with students, colleagues, and the academic community. They aspire to establish a secure and collaborative learning atmosphere that promotes intellectual development, analytical thinking, and academic independence while providing equitable opportunity to all students. Each course teacher should make a conscious and intentional effort to create a climate of ethics that will limit the occurrence of unethical behavior among his or her students.”

Respondent Code: IQAC1; Gender: M; Age: 52; Designation: professor; Institution: JnU; Experience: 33; Education: PhD; Interview Date: 17.03.23; 10PM

Respondent Code: IQAC6; Gender: M; Age: 56; Designation: professor; Institution: RU; Experience: 35; Education: PhD; Interview Date: 16.03.23; 10AM

Respondent Code: D3; Gender: M; Age: 57; Designation: professor; Institution: HSTU; Experience: 24; Education: MBA; PGD; Interview Date: 11.03.23; 3PM

Respondent Code: T2; Gender: M; Age: 55; Designation: professor; Institution: RU; Experience: 32; Education: PhD; Interview Date: 18.03.23; 10PM

Respondent Code: ST1; Gender: M; Age: 25; Designation: Student; Institution: RU; Experience: 6; Education: MBA; Interview Date: 08.05.23; 3PM

Ethical instructors uphold confidentiality, protect pupils' privacy and personal information, and prevent all forms of discrimination and harassment. They encourage learners to pursue knowledge with integrity and provide help to resolve ethical quandaries by promoting honesty, intellectual honesty, and integrity in academia (Baumgarten, 1982). They exhibit a dedication to ongoing professional development by remaining up to date on research and best practices in their area, as well as maintaining an open and engaging discourse with students. It is also the university's ethical responsibility to take the necessary steps, such as active proctoring in the examination hall, motivating students toward ethical activities, setting creative questions, and so on, to prevent students from cheating, plagiarism, misbehavior, and other forms of unethical behavior.

“Teachers recruitment and selection process should be fair to find the best specialized faculties to improve quality in universities. Here, every stakeholder

should follow roles, policies and code of conduct strictly. Teachers should be regular at his or her routine work, such as regular present in classroom, gathering up to date knowledge for providing lecture, concern regarding regular students' assessment."

Respondent Code: IQAC5; Gender: M; Age: 45; Designation: professor; Institution: RU; Experience: 20; Education: PhD; Interview Date: 25.03.23; 2PM

Respondent Code: D1; Gender: M; Age: 57; Designation: professor; Institution: RU; Experience: 28; Education: PhD; Interview Date: 14.05.23; 2PM

Respondent Code: CH3; Gender: M; Age: 52; Designation: professor; Institution: RU; Experience: 33; Education: PhD; Interview Date: 14.05.23; 3PM

Respondent Code: T2; Gender: M; Age: 55; Designation: professor; Institution: RU; Experience: 32; Education: PhD; Interview Date: 18.03.23; 10PM

Respondent Code: SF2; Gender: M; Age: 55; Designation: Deputy Register; Institution: RU; Experience: 26; Education: MA; Interview Date: 07.05.23; 2PM

Respondent Code: ST3; Gender: F; Age: 25; Designation: Student; Institution: RU; Experience: 6; Education: MA; Interview Date: 09.05.23; 10AM

The discussion highlights the significance of creating an interactive learning environment in universities. Such an environment promotes active student engagement, appropriate classroom facilities, a current curriculum, student-centered teaching methods, and effective evaluation systems. However, challenges such as large class sizes, outdated teaching techniques, and limited access to resources must be addressed. By encouraging active participation, providing suitable facilities, modernizing the curriculum, employing student-centered approaches, and enhancing evaluation systems, educational institutions can improve the quality of education and boost student engagement. Efforts should also focus on overcoming resource shortages and enhancing digital literacy among both teachers and students.

In universities, a research-based culture fosters inquiry, creativity, and critical thinking. It encourages knowledge acquisition, rational decision-making, and lifelong learning, leading to new ideas and discoveries. However, underfunding hampers high-quality research and limits faculty contributions. To address this issue, universities should prioritize research infrastructure, promote faculty engagement, and involve students through internship and mentorship programs. Activities such as research assignments and problem-solving exercises cultivate critical thinking skills, encouraging students to challenge assumptions and explore innovative alternatives. In summary, a research-based culture and critical thinking are essential for intellectual growth and social advancement, requiring adequate funding, resources, and support for faculty and student research.

The lack of training and learning centers for university professors hampers their ability to enhance pedagogical skills, implement effective teaching techniques, and stay updated in their fields. This gap prevents them from providing students with valuable insights and practical applications. Additionally, a shortage of trained teachers and limited professional development opportunities, especially in rural areas, exacerbates the situation. Establishing training and learning centers would empower professors to improve their teaching abilities and create a conducive learning environment.

In university education, fragmented legislative frameworks and ineffective governance structures hinder efficient administration and collaboration. To overcome these challenges, transparency, accountability, and effectiveness in governance must be prioritized. Transparency is particularly important in preventing irregularities and malpractices in areas such as faculty recruitment, student enrollment, and assessments. Universities must implement safeguards to ensure that administrators and staff act in the best interests of students and the public. This could include independent oversight, anti-corruption measures, and monitoring organizations. Transparency fosters trust and holds leaders accountable, while accountability ensures responsible actions, and efficiency maximizes resource use. By focusing on these areas, universities can establish effective governance, leading to educational advancement, stability, and prosperity.

The lack of modern technological and infrastructure facilities significantly impacts the quality of education and student experiences. Key issues include insufficient computer laboratories, slow internet connectivity, limited access to digital libraries, and inadequate supervision of existing labs. To improve this situation, universities should prioritize investments in modern infrastructure, such as well-equipped computer laboratories, high-speed internet access, digital library services, smart classrooms, and campus-wide Wi-Fi coverage. Upgrading lecture halls, research centers, sports facilities, and residence halls will also contribute to a well-rounded educational experience. By addressing these infrastructural gaps, universities can enhance the learning environment, stimulate creativity and collaboration, and prepare students for the demands of the digital age. Increased funding, government incentives, private-sector partnerships, and proactive maintenance will be crucial in achieving these goals.

Academic ethics are essential for fostering a healthy and inclusive learning environment. Teachers should serve as ethical role models, demonstrating honesty, integrity, and fairness in their interactions with students. To maintain academic integrity, educators must emphasize honesty, discourage plagiarism, and ensure

that students understand ethical principles. Respecting confidentiality, supporting inclusion, and pursuing continuous professional development are also vital aspects of ethical behavior. Universities must uphold ethical standards by preventing misconduct and ensuring fair recruitment processes. Overall, emphasizing ethics in teaching and learning is critical for developing responsible and engaged learners who contribute positively to society.

5. Implications of the Study

The findings of this paper have significant practical implications for the higher education sector in Bangladesh, aimed at enhancing the quality of education in the country. This research provides policymakers with comprehensive insights into the most effective strategies for improving the quality of higher educational institutions in Bangladesh. Implementing modern practices, such as active learning approaches and robust student feedback systems, can enhance student satisfaction with the teaching and learning processes. This highlights the need for institutions to invest in training faculty members in active learning methodologies and establishing mechanisms for comprehensive feedback. Establishing a strong research-based culture is crucial for fostering inquiry, creativity, and critical thinking. This requires adequate funding for research facilities, promoting faculty engagement, and involving students in research activities through internships and mentorship programs. The lack of training and learning centers for university professors hinders their ability to enhance pedagogical skills and stay updated in their fields. Establishing such centers can empower professors to improve their teaching abilities and create conducive learning environments.

Fragmented legislative frameworks and ineffective governance structures hinder efficient administration and collaboration in universities. Prioritizing transparency, accountability, and effectiveness in governance can address these issues, ensuring that administrators and staff act in the best interests of students and the public. Inadequate technological and infrastructure facilities negatively impact the quality of education and student experiences. Universities should prioritize investments in modern infrastructure, such as computer laboratories, high-speed internet connectivity, digital library services, smart classrooms, and campus-wide Wi-Fi coverage, to enhance the learning environment and prepare students for the digital age. Emphasizing academic ethics is essential for promoting a healthy and inclusive learning environment. Universities should ensure that teachers act as ethical role models, uphold principles of honesty, integrity, and fairness, and discourage unethical behaviors such as plagiarism. Respecting confidentiality, supporting inclusion, and fostering ongoing professional development are also critical components of ethical behavior in academia.

Overall, these implications suggest the need for comprehensive reforms across various aspects of academic institutions, including teaching methodologies, research culture, infrastructure development, governance, and ethical standards, to enhance the quality of education and contribute to the overall advancement of society.

6. Limitations and Future Study Directions

The study's drawbacks include a lack of specific contextual details, insufficient empirical evidence to support the assertions, incomplete coverage of challenges in establishing interactive learning environments, an excessive focus on infrastructure issues, a lack of alternative viewpoints, and a narrow scope limited to universities without considering the broader educational context. These limitations reduce the applicability, reliability, and comprehensiveness of the findings and recommendations discussed. Researchers could provide a more comprehensive and nuanced evaluation of the factors affecting quality by integrating qualitative insights with broader quantitative data. Future research endeavors might aim to address these deficiencies and enhance our understanding of how to foster interactive learning environments in university settings. This could involve contextual analyses, empirical investigations, thorough examinations of challenges, and the adoption of a holistic educational perspective. Additionally, comparative studies, exploration of innovative methods and technologies, and longitudinal studies to assess long-term effects could be pursued. Exploring these avenues would facilitate a deeper understanding of effective strategies for enhancing student engagement and academic outcomes in higher education.

7. Conclusion

This study emphasizes the importance of establishing interactive learning environments within universities to enhance student engagement, improve educational quality, and nurture critical thinking skills. It highlights the value of active student involvement, adequate facilities, updated curricula, student-centered teaching methods, and effective assessment strategies. Despite limitations in contextual specificity and empirical evidence, the study offers valuable insights and recommendations for future research endeavors. To advance this field, upcoming studies should focus on conducting context-specific investigations, empirical analyses, and comprehensive assessments of relevant issues. Adopting a holistic approach that considers the broader educational context and exploring innovative ideas and technologies can further contribute to a deeper understanding of how to cultivate interactive learning environments that enhance student experiences and academic outcomes. By addressing these limitations and pursuing research opportunities, universities can foster a culture of intellectual advancement

and societal progress. This endeavor equips students with the necessary skills to thrive in the digital age while ensuring that higher education institutions evolve to meet the demands of a rapidly changing world. Ultimately, the pursuit of interactive learning environments is crucial for the ongoing advancement and innovation of university education.

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