



MODULE: LCMB7035 – DISSERTATION

**STRATEGIC WORKFORCE PLANNING AND PRODUCTIVITY OPTIMIZATION IN
APPAREL FACTORIES: EVIDENCE FROM DHAKA AND GAZIPUR, BANGLADESH**

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DECLARATION

I declare that this dissertation, *Strategic Workforce Planning and Productivity Optimization in Apparel Factories: Evidence from Dhaka and Gazipur, Bangladesh*, is my own work and has not been submitted previously, in whole or in part, for any degree or qualification at this or any other institution.

All sources used in the preparation of this dissertation have been properly acknowledged and referenced. Any views expressed are those of the author.

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ABSTRACT

This study endeavours to examine how strategic workforce planning (SWP) is associated with productivity optimisation in apparel factories in Dhaka and Gazipur, Bangladesh. A mixed-methods design combined a quantitative worker survey ($N = 139$) with eight semi-structured interviews with managers and technical staff to triangulate results and explain implementation barriers. Quantitative analysis showed statistically significant positive correlations between productivity and all SWP dimensions (manpower forecasting, recruitment and selection, training and skill development, and work scheduling and allocation). Multiple regression indicated a strong model ($R^2 = .886$), with manpower forecasting, recruitment and selection, and training and skill development emerging as significant positive predictors of productivity, while work scheduling and allocation showed a significant negative effect when other SWP dimensions were controlled. Interview themes explained these patterns: forecasting is often short-horizon and reactive because of buyer plan changes and attendance volatility, fast hiring can reduce skill fit and create learning and rework losses, and training is valued but unevenly delivered. Participants also described “firefighting” scheduling through overtime and frequent redeployment, which can protect short-term shipment performance but undermine sustainable output through fatigue, instability and quality risks. Overall, the study concludes that productivity is strongest when SWP is forward-looking, skill-focused and integrated with production planning, prioritising job-linked training, SMV- and capacity-based manpower planning, and faster but higher-quality selection, while using scheduling as a controlled support tool. Key limitations include cross-sectional design, self-reported measures, and a two-cluster sample, highlighting the need for larger, longitudinal studies using objective operational metrics. The findings offer evidence-based recommendations for better strategic workforce planning for effective and sustainable productivity optimisation in apparel factories in Bangladesh also provide suggestions for future studies in this arena.

Keywords: Strategic workforce planning, Productivity optimisation, Apparel (RMG) factories, Bangladesh, Mixed-methods research

TABLE OF CONTENTS

DECLARATION.....	i
ACKNOWLEDGEMENTS.....	ii
ABSTRACT.....	iii
TABLE OF CONTENTS.....	iv
LIST OF TABLES	viii
LIST OF FIGURES	ix
LIST OF ABBREVIATIONS	x
CHAPTER ONE: INTRODUCTION.....	1
1.1 CHAPTER OVERVIEW	1
1.2 BACKGROUND OF THE STUDY	1
1.3 PROBLEM STATEMENT.....	3
1.4 RESEARCH AIM AND OBJECTIVES	4
1.5 RESEARCH QUESTIONS	4
1.6 SCOPE AND DELIMITATIONS	5
1.7 SIGNIFICANCE OF THE STUDY.....	5
1.8 OVERVIEW OF THEORETICAL FRAMEWORK.....	6
1.9 STRUCTURE OF THE DISSERTATION.....	7
1.10 CHAPTER SUMMARY	7
CHAPTER 2: LITERATURE REVIEW	8
2.1 CHAPTER OVERVIEW	8
2.2 CONCEPT OF WORKFORCE PLANNING.....	8
2.3 WORKFORCE PLANNING AND PRODUCTIVITY IN THE APPAREL SECTOR	
10	
2.4 WORKPLACE ENVIRONMENT, WORK ABILITY AND EMPLOYEE	
OUTCOMES IN THE RMG SECTOR	11
2.5 STRATEGIC WORKFORCE PLANNING DIMENSIONS IN APPAREL	
FACTORIES	13

2.6	THEORETICAL FRAMEWORK	15
2.7	RESEARCH GAP AND JUSTIFICATION.....	16
2.8	CONCEPTUAL FRAMEWORK AND HYPOTHESES	18
2.9	CHAPTER SUMMARY	19
CHAPTER THREE: METHODOLOGY		20
3.1	CHAPTER OVERVIEW	20
3.2	RESEARCH PHILOSOPHY AND PARADIGM	20
3.3	RESEARCH DESIGN AND APPROACH	21
3.4	RESEARCH SETTING AND TARGET POPULATION.....	21
3.5	SAMPLING STRATEGY AND SAMPLE SIZE	22
3.6	DATA COLLECTION METHODS	22
3.6.1	WORKER SURVEY QUESTIONNAIRE.....	23
3.6.2	SEMI-STRUCTURED INTERVIEWS WITH MANAGERS	23
3.7	DATA ANALYSIS, VALIDITY, RELIABILITY AND TRUSTWORTHINESS	24
3.8	ETHICAL CONSIDERATIONS	25
3.9	METHODOLOGICAL LIMITATIONS	25
3.10	CHAPTER SUMMARY	26
CHAPTER 4: DATA ANALYSIS AND FINDINGS.....		27
4.1	CHAPTER OVERVIEW	27
4.2	QUANTITATIVE ANALYSIS	27
4.2.1	DEMOGRAPHIC ANALYSIS	28
4.2.2	DESCRIPTIVE ANALYSIS.....	33
4.2.3	RELIABILITY ANALYSIS.....	34
4.2.4	CORRELATION ANALYSIS.....	35
4.2.5	REGRESSION ANALYSIS.....	36
4.3	QUALITATIVE ANALYSIS	38
4.3.1	INTERVIEW PARTICIPANT PROFILE.....	38

4.3.2 THEMATIC ANALYSIS	39
4.4 INTEGRATION AND TRIANGULATION	43
4.5 CHAPTER SUMMARY	43
CHAPTER 5: DISCUSSION.....	44
5.1 CHAPTER OVERVIEW	44
5.2 DISCUSSION OF FINDINGS BY RESEARCH QUESTIONS.....	44
5.2.1 CURRENT SWP PRACTICES AND HOW THEY OPERATE IN FACTORIES (DHAKA AND GAZIPUR).....	44
5.2.2 HOW SWP DIMENSIONS INFLUENCE PRODUCTIVITY (HYPOTHESES INTERPRETATION).....	45
5.2.3 BARRIERS AND CONSTRAINTS THAT SHAPE SWP EFFECTIVENESS	47
5.3 IMPLICATIONS OF THE STUDY.....	48
5.4 CHAPTER SUMMARY	49
CHAPTER 6: RECOMMENDATIONS AND CONCLUSION.....	50
6.1 CHAPTER OVERVIEW	50
6.2 RECOMMENDATION.....	50
6.3 CONCLUSION.....	51
REFERENCES	54
APPENDIX A	58
QUOTATIVE SURVEY QUESTIONER.....	58
APPENDIX B	70
INTERVIEW GUIDE	70
APPENDIX C	71
SPSS DATA ANALYSIS	71

LIST OF TABLES

TABLE 4.1: DATA SCREENING OUTCOMES AND FINAL SAMPLE SIZE	27
TABLE 4.2: DEMOGRAPHIC PROFILE OF SURVEY RESPONDENTS (N = 139)	28
TABLE 4.3: DESCRIPTIVE STATISTICS OF KEY CONSTRUCTS	32
TABLE 4.4: RELIABILITY ANALYSIS	35
TABLE 4.5: CORRELATION MATRIX	35
TABLE 4.5: MULTIPLE REGRESSION MODEL SUMMARY FOR PREDICTING PRODUCTIVITY	36
TABLE 4.6: ANOVA RESULTS FOR THE REGRESSION MODEL PREDICTING PRODUCTIVITY	36
TABLE 4.7: REGRESSION COEFFICIENTS FOR STRATEGIC WORKFORCE PLANNING DIMENSIONS PREDICTING PRODUCTIVITY	37
TABLE 4.8: INTERVIEW PARTICIPANT SUMMARY	38
TABLE 4.9 THEMATIC ANALYSIS SUMMARY	42
TABLE 5.1: HYPOTHESES ACCEPTANCE OR REJECTION	47

LIST OF FIGURES

FIGURE 2.1: CONCEPTUAL FRAMEWORK	18
FIGURE 4.1: RESPONDENT DISTRIBUTION BY FACTORY LOCATION (DHAKA VS GAZIPUR)	29
FIGURE 4.2: GENDER DISTRIBUTION OF RESPONDENTS	29
FIGURE 4.3: AGE GROUP DISTRIBUTION OF RESPONDENTS	30
FIGURE 4.5: RESPONDENTS BY DEPARTMENT/SECTION	31
FIGURE 4.6: EMPLOYMENT TYPE OF RESPONDENTS	31
FIGURE 4.7: TOTAL YEARS OF EXPERIENCE IN THE RMG SECTOR	32
FIGURE 4.8: YEARS WORKING IN THE CURRENT FACTORY	32
FIGURE 4.9: HIGHEST EDUCATION LEVEL COMPLETED BY RESPONDENTS (IF YOU ALSO WANT A FIGURE FOR EDUCATION)	33
FIGURE 4.10: MEAN OF THE KEY CONSTRUCTS	34
FIGURE 4.11: HISTOGRAM OF REGRESSION STANDARDISED RESIDUALS FOR THE PRODUCTIVITY MODEL	37
FIGURE 4.12: NORMAL P-P PLOT OF REGRESSION STANDARDISED RESIDUALS FOR THE PRODUCTIVITY MODEL	37

LIST OF ABBREVIATIONS

Abbreviation	Full form / Meaning
AMO	Ability–Motivation–Opportunity (framework)
HR	Human Resources
HPWP / HPWPs	High-Performance Work Practice(s)
HPWS	High-Performance Work System(s)
IFC	International Finance Corporation
ILO	International Labour Organization
SEIP	Skills for Employment Investment Program (Bangladesh)
SMV	Standard Minute Value
SOP	Standard Operating Procedure
SPSS	Statistical Package for the Social Sciences (IBM SPSS Statistics)
SWP	Strategic Workforce Planning

CHAPTER ONE: INTRODUCTION

1.1 CHAPTER OVERVIEW

This chapter introduces the study on strategic workforce planning (SWP) and productivity optimisation in Bangladesh's ready-made garments (RMG) sector, with a particular focus on factories in Dhaka and Gazipur. It first outlines the economic significance of the RMG industry in terms of export earnings, GDP contribution and female employment, while highlighting emerging challenges related to volatile orders, rising costs and future changes in trade preferences. The chapter then presents evidence of persistent productivity, planning and HRM weaknesses inside factories, including non-productive time, high turnover and constrained work ability. Against this backdrop, it formulates the research problem, aim, objectives and questions, and explains the scope and delimitations of the inquiry. The chapter also sets out the significance of the study for theory, empirical knowledge and managerial practice, and introduces the integrated theoretical framework drawing on Human Capital Theory, the Resource-Based View and the AMO perspective. Finally, it outlines the overall structure of the dissertation.

1.2 BACKGROUND OF THE STUDY

The ready-made garments (RMG) sector is the backbone of Bangladesh's industrial economy and the country's most important export earner. From a handful of factories in the late 1970s, the industry has expanded to more than 4,600 export-oriented units, generating about US\$47 billion in export earnings in FY2023 and contributing around 11% of national GDP (IIX, 2025). Official statistics indicate that RMG now accounts for approximately 84–85% of Bangladesh's total merchandise export receipts, underlining its central role in foreign exchange generation and macroeconomic stability (Azran, 2024).

In employment terms, the sector provides jobs for over 4 million workers, the majority of whom are women entering formal wage employment for the first time (LightCastle Analytics Wing, 2023; IIX, 2025). Estimates suggest that women represent roughly 60–65% of the direct workforce, making the RMG industry one of the most significant drivers of female labour force participation and household income growth in South Asia (IIX, 2025). Key industrial clusters such as Dhaka and Gazipur host a dense concentration of factories, subcontractors and support services, and are therefore critical locations for understanding how workforce management practices shape productivity and competitiveness in the sector.

Recent trade data show that Bangladesh has maintained its position as the world's second-largest apparel exporter after China, but faces a more challenging operating environment. RMG exports grew by around 8% year-on-year in the first nine months of 2023, reaching US\$35.6 billion for January–September alone, yet this growth has been accompanied by heightened volatility in orders and input costs (LightCastle Analytics Wing, 2023). The industry suffered an estimated US\$3.16 billion loss in orders during the early phases of the Covid-19 pandemic and remains heavily dependent on imported raw materials, with around two-thirds of inputs sourced from China (LightCastle Analytics Wing, 2023). At the same time, Bangladesh's forthcoming graduation from least-developed country (LDC) status raises the prospect of reduced trade preferences and tighter competition on both price and lead time.

Within factories, a growing body of research highlights persistent productivity and efficiency challenges. Studies of production planning and sewing line configuration in Bangladeshi garments factories show that poor planning, frequent style changes and weak follow-up practices contribute to non-productive time, bottlenecks and late shipments, which in turn lead to discounting and margin pressure (Habib, 2023; Rahman et al., 2024). Imbalanced lines waste both machine capacity and operator time, while uneven task allocation increases fatigue and quality problems, undermining overall output per worker. These technical issues are compounded by fragmented HR systems. Empirical work indicates that many factories continue to rely on basic, compliance-driven HRM with limited strategic focus on skill pipelines, career paths or systematic workforce planning (Rashid et al., 2019; Ali, 2022; Newaz et al., 2023).

Working conditions and wage dynamics introduce further complexity. The statutory minimum wage for RMG workers, first set at BDT 8,000 in 2018, was increased to BDT 12,500 in late 2023, yet still falls short of trade union demands and is widely reported to lag behind rising living costs (LightCastle Analytics Wing, 2023). Research links low wages, long hours, excessive overtime and limited promotion prospects to high turnover and absenteeism in garment factories, both of which disrupt production stability and raise recruitment and training costs (Hossain and Mahmood, 2018; Ullah et al., 2024). Studies on workplace environment and work ability show that inadequate ergonomics, poor ventilation, crowding and insufficient rest periods contribute to musculoskeletal problems and only moderate levels of work ability among many workers, especially women (Zohra et al., 2025; Ahmed and Chowdhury, 2025). These conditions erode employees' capacity to sustain high performance over time.

At the same time, there is evidence that more strategic people management can generate measurable productivity gains. International research on high-performance work practices (HPWPs) finds that bundles of HR practices such as selective staffing, extensive training, performance-based pay and employee involvement are associated with lower turnover, higher labour productivity and stronger financial performance (Huselid, 1995; Sheehan and Garavan, 2022). In the Bangladesh RMG context, evaluations of Better Work's Gender Equality and Returns (GEAR) programme report that training and promoting female operators into supervisory roles can raise line productivity by around 5% on average and substantially increase promoted women's wages (Better Work, 2023). Together, these findings suggest that deliberately designed workforce strategies, rather than ad hoc staffing and overtime, are crucial for converting labour inputs into sustainable productivity gains.

Against this backdrop, strategic workforce planning emerges as a key lever for the long-term competitiveness of apparel factories in Dhaka and Gazipur. SWP provides a structured way to align manpower forecasting, recruitment and selection, training and skill development, and work scheduling and allocation with fluctuating buyer demand and evolving skill requirements. In a sector where labour costs, line efficiency and lead times are decisive, understanding how SWP practices are currently used and how they relate to productivity optimisation is both an analytical gap and a practical priority for managers and policymakers.

1.3 PROBLEM STATEMENT

The Bangladeshi RMG sector operates at the intersection of intense global cost competition and rising expectations regarding quality, lead times and compliance. While the industry has achieved impressive export growth, productivity levels remain uneven across factories and lines. Evidence from production planning and line balancing studies shows that poor planning leads to late shipments, discounts and under-utilisation of human and material resources, while improved planning methods can reduce bottlenecks and increase efficiency (Habib, 2023; Rahman et al., 2024). At the same time, research on HRM, workplace environment and work ability reveals widespread challenges related to low wages, excessive overtime, skill gaps, limited promotion opportunities and health risks, which contribute to turnover, absenteeism and reduced performance (Hossain and Mahmood, 2018; Ahmed and Chowdhury, 2025; Zohra et al., 2025; Ullah et al., 2024).

Existing studies tend to treat these issues in isolation. Some focus on technical aspects of production planning and line configuration, while others examine HR practices, satisfaction,

commitment or work ability. Only a few attempt to bring these strands together within an integrated strategic workforce planning perspective. As a result, there is limited empirical evidence on how specific SWP dimensions such as manpower forecasting, recruitment and selection, training and skill development, and work scheduling and allocation jointly influence productivity in apparel factories. There is also little research that combines worker and management perspectives to understand how planned systems are implemented on the factory floor and experienced by employees in different roles.

In major clusters like Dhaka and Gazipur, these gaps are particularly concerning. Factories often rely on reactive measures, such as overtime, temporary workers and last-minute rescheduling, to cope with demand fluctuations. This approach may secure short-term output but can erode worker health, satisfaction and long-term productivity. Without a clear understanding of how strategic workforce planning practices are designed, implemented and linked to productivity outcomes in this context, managers have limited guidance on how to move from reactive workforce management to proactive, evidence-based planning.

This study addresses this problem by investigating the relationships between key SWP dimensions and productivity optimisation in apparel factories in Dhaka and Gazipur, drawing on the combined insights of workers and managers.

1.4 RESEARCH AIM AND OBJECTIVES

The primary aim of the study is to evaluate how strategic workforce planning (SWP) practices are associated with productivity performance in apparel factories in Dhaka and Gazipur, Bangladesh.

- To examine the current SWP practices in apparel factories (e.g., forecasting, recruitment, skill development, and scheduling).
- To assess the relationship between SWP practices and key productivity indicators
- To identify the main operational and organisational challenges that affect the implementation of effective workforce planning.
- To develop a practical framework with recommendations to improve workforce planning and productivity in the Bangladeshi apparel sector.

1.5 RESEARCH QUESTIONS

- What SWP practices are currently being used in apparel factories in Dhaka and Gazipur?

- What is the relationship between SWP practices and productivity performance indicators?
- What organisational and operational challenges do factories face when trying to implement effective workforce planning?
- How can a practical workforce planning framework be designed to help apparel factories improve productivity and operational stability?

1.6 SCOPE AND DELIMITATIONS

The study focuses on woven and knit apparel factories located in two major industrial zones, Dhaka and Gazipur. These areas host a large concentration of export-oriented factories and represent diverse ownership structures and buyer relationships. The empirical work covers a purposive sample of factories within these zones and includes both production workers and managerial staff.

The scope is limited in several ways. First, the study concentrates on four SWP dimensions that the literature identifies as particularly salient for apparel production: manpower forecasting, recruitment and selection, training and skill development, and work scheduling and allocation. Other HRM elements, such as industrial relations or detailed reward system design, are considered only to the extent that they interact with these dimensions. Second, the research adopts a cross-sectional design, which captures relationships at a single point in time and does not track changes in SWP practices or productivity over longer periods. Third, data are collected from a limited number of factories and therefore do not claim to represent the entire RMG sector.

Within these delimitations, the study aims to provide a rich and context-sensitive analysis of SWP practices and productivity outcomes in selected factories and to generate insights that may be relevant for similar settings.

1.7 SIGNIFICANCE OF THE STUDY

The study has several areas of significance. From a theoretical perspective, it contributes to the integration of Human Capital Theory and the Resource-Based View with the Ability–Motivation–Opportunity (AMO) framework in a labour-intensive manufacturing context. While prior research has shown that high-performance work practices and human capital investments are associated with productivity and financial performance in developed economies (Huselid, 1995; Sheehan and Garavan, 2022), there is less work that applies these

ideas to line-level operations in export-oriented garment factories in Bangladesh. By examining multiple SWP dimensions together and linking them to productivity indicators, the study helps to extend these theories to a new context.

Empirically, the study responds to calls for more comprehensive and context-specific research on HR systems, workplace conditions and productivity in the RMG sector (Rashid et al., 2019; Ali, 2022; Newaz et al., 2023). It brings together evidence on production planning, line balancing, workplace environment, work ability and HR practices within a single conceptual framework. By combining quantitative survey data from workers with qualitative interviews with managers, it also offers a deeper understanding of how SWP practices are interpreted and enacted at different organisational levels.

In practical terms, the findings have potential value for factory owners, managers and industry bodies. A clearer picture of how forecasting, recruitment, training and scheduling practices influence productivity can inform more strategic decisions about workforce planning, skill development and job design. Insights into barriers and enablers of SWP implementation can help managers design interventions that are realistic in the face of buyer demands, labour market constraints and regulatory requirements. Finally, the study can support policy discussions on how to promote sustainable productivity improvements that balance competitiveness with worker well-being in Bangladesh's garment industry.

1.8 OVERVIEW OF THEORETICAL FRAMEWORK

This study is guided by an integrated theoretical framework that combines Human Capital Theory, the Resource-Based View (RBV) and the Ability–Motivation–Opportunity (AMO) perspective. Human Capital Theory explains how investments in workers' skills, experience and development can raise productivity over time, while the RBV highlights the potential of a skilled and committed workforce to become a source of sustained competitive advantage when it is valuable, rare, hard to imitate and well organised. The AMO framework links these ideas to specific HR practices by suggesting that performance improves when employees have the ability, motivation and opportunity to contribute. Within this combined lens, strategic workforce planning in apparel factories is conceptualised through four core dimensions: manpower forecasting, recruitment and selection, training and skill development, and work scheduling and allocation, which together shape how human capital is built and deployed to support productivity optimisation. Other factors noted in the literature, such as compensation, workplace environment and leadership, are treated as important contextual influences on

motivation and work ability rather than as separate variables in the empirical model. Chapter Two develops this theoretical foundation in more detail and translates it into the conceptual framework and hypotheses that guide the study.

1.9 STRUCTURE OF THE DISSERTATION

The remainder of the dissertation is organised into five chapters. Chapter Two, the Literature Review, critically examines the concepts of workforce planning and strategic workforce planning, reviews empirical evidence on planning and productivity in the apparel sector, explores workplace environment, work ability and HR practices, and develops the theoretical and conceptual framework and hypotheses for the study. Chapter Three, the Research Methodology, outlines the research philosophy, design and methods, including the mixed-methods approach, sampling strategy, data collection instruments, data analysis procedures and ethical considerations. Chapter Four, Data Analysis and Findings, presents the quantitative and qualitative results, including descriptive statistics, hypothesis testing and thematic analysis of interview data. Chapter Five, Discussion, interprets the findings in relation to the research questions, theoretical framework and existing literature, and explores their theoretical and practical implications. Chapter Six, Conclusion and Recommendations, summarises the study, answers the research questions, sets out recommendations for managers and policymakers, reflects on the limitations of the research and suggests directions for future work.

1.10 CHAPTER SUMMARY

This chapter has situated the study within the broader context of Bangladesh's RMG sector, emphasising its macroeconomic importance and the concentration of factories in Dhaka and Gazipur. It has shown that, despite sustained export growth, many factories experience uneven productivity, weak planning systems, fragmented HRM and challenging working conditions that undermine worker well-being and long-term performance. On this basis, the chapter articulated a clear problem statement and set out the overarching research aim, four specific objectives and corresponding research questions. It clarified the scope of the study by defining the geographical focus, target population and selected SWP dimensions, and acknowledged key delimitations related to design and generalisability. The chapter also explained why the research is theoretically, empirically and practically significant, and introduced an integrated theoretical framework that combines Human Capital Theory, the Resource-Based View and the AMO model to conceptualise SWP and productivity optimisation. This provides the foundation for the detailed literature review in Chapter Two.

CHAPTER 2: LITERATURE REVIEW

2.1 CHAPTER OVERVIEW

This chapter reviews the existing literature on strategic workforce planning (SWP) and productivity in the Bangladeshi ready-made garments (RMG) sector, alongside wider evidence on high-performance work practices (HPWPs), workplace environment, work ability, compensation and gender-focused skill development. The discussion is organised into seven main sections. The first section clarifies the concept and theoretical foundations of workforce planning, linking it to Human Capital Theory, the Resource-Based View (RBV) and HPWPs. The second section synthesises empirical evidence on planning and productivity in the apparel sector, with a focus on Bangladesh. The third section examines how workplace environment, work ability and HR practices shape employee outcomes. The fourth section reviews key SWP dimensions that are particularly relevant for apparel factories, namely manpower forecasting, recruitment and selection, training and skill development, and work scheduling and allocation. The fifth section outlines the theoretical framework guiding the study. The sixth section identifies the research gap and justifies the present investigation. The final section presents the conceptual framework and hypotheses. Together, the chapter provides the conceptual and empirical grounding for examining how SWP practices contribute to productivity optimisation in apparel factories in Dhaka and Gazipur.

2.2 CONCEPT OF WORKFORCE PLANNING

Workforce planning is generally defined as a systematic process for aligning an organisation's human resources with its current and future business needs. It involves anticipating labour demand, assessing current workforce supply, identifying gaps in skills and headcount, and developing interventions so that the right people with the right skills are available at the right time (Sheehan and Garavan, 2022). Rather than a narrow administrative exercise, contemporary authors view workforce planning as a strategic activity that directly supports competitiveness and performance.

In a six-wave longitudinal study of UK manufacturing and service SMEs, Sheehan and Garavan (2022) conceptualise workforce planning through the lens of HPWPs. HPWPs are bundles of employee-focused HR practices such as selective staffing, extensive training, participation in decision making, performance-based pay and supportive supervision that are designed to enhance employees' abilities, motivation and opportunities to contribute. Their study finds a statistically significant positive relationship between HPWPs at earlier time points

and labour productivity at later time points, which provides rare longitudinal evidence for a causal link between people management practices and productivity outcomes (Sheehan and Garavan, 2022).

Large-sample evidence from other contexts supports this view. Huselid (1995) analyses almost one thousand US firms and shows that systems of HPWPs are associated with lower employee turnover, higher productivity and stronger corporate financial performance. This reinforces the argument that workforce planning and HR systems are central levers for organisational performance rather than peripheral support functions.

Andrew Mayo (2015) similarly argues that strategic workforce planning is a “vital business activity” that translates business strategy, demand forecasts and productivity assumptions into specific headcount and skills plans. He distinguishes such strategic workforce planning from short-term staffing, stressing that it requires explicit linkage to business priorities, workforce risk analysis and scenario planning (Mayo, 2015). This perspective is especially salient in volatile and labour-intensive industries such as apparel manufacturing.

The theoretical foundations for SWP rest largely on Human Capital Theory and the RBV. Human Capital Theory, as developed by Becker (1964), views education, training and work experience as investments that enhance workers’ skills and knowledge, which in turn increase their productivity and earnings. In the RMG context, Ullah et al. (2024) provide empirical support for this logic by showing that compensation and organisational commitment improve job satisfaction, and that both satisfaction and commitment are positively associated with work productivity. Their findings suggest that organisations which invest in employees through fair compensation and supportive relationships can expect higher levels of effort and performance.

The RBV complements this view by arguing that firms achieve sustainable competitive advantage when they possess resources that are valuable, rare, difficult to imitate and effectively organised. Human resources are one such strategic asset when the firm can develop and retain a skilled and committed workforce that competitors cannot easily copy (Sheehan and Garavan, 2022). Huselid’s (1995) work indicates that HPWPs can form such a resource by creating integrated systems that build skills, motivation and alignment with organisational goals.

Many HPWS studies use the Ability–Motivation–Opportunity (AMO) framework to explain these effects. HR practices such as training and development enhance employee abilities, reward and recognition systems strengthen motivation, and participative decision making and

job design provide opportunities to contribute (Huselid, 1995; Kloutsiniotis et al., 2021). From this standpoint, SWP is the process through which organisations design and coordinate these investments and practices over time.

In summary, the literature positions strategic workforce planning as a core part of strategic HRM. It is the mechanism through which organisations forecast and develop human capital, deploy HPWPs and translate them into sustained productivity gains. For labour-intensive sectors such as apparel manufacturing, where labour costs, efficiency and lead time are critical, this linkage is particularly important.

2.3 WORKFORCE PLANNING AND PRODUCTIVITY IN THE APPAREL SECTOR

The Bangladeshi apparel sector is the leading export industry and a major employer, yet it faces persistent productivity challenges that are closely linked to weak planning and HR systems (Habib, 2023; Rahman et al., 2024). Habib (2023) examines production planning activities in garments factories, including job scheduling, material resource planning, capacity planning, line planning, follow-up, inspection and teamwork. The study finds that efficient production planning is associated with reduced lead times, higher profit margins and more efficient use of human and material resources. In contrast, poor planning leads to late shipments, discounts, elevated operational stress and quality problems, all of which reflect under-utilisation or misallocation of labour.

Rahman et al. (2024) focus more specifically on sewing line balancing. They compare three-line balancing techniques – Largest Candidate Rule, Rank Positional Weight and Moodie Young – with an existing line configuration in a Bangladeshi RMG factory. Using indicators such as balance accuracy, resource utilisation, bottleneck reduction and a material flow index, they show that the Moodie Young method achieves superior resource efficiency with fewer machines, while the existing method has the lowest balance accuracy and the highest number of bottlenecks (Rahman et al., 2024). Line balancing is conceptualised as the even distribution of tasks across workstations in order to minimise idle time, reduce operator movement and prevent bottlenecks that delay overall flow.

These studies highlight the technical side of workforce planning by showing that production planning and line configuration are central determinants of productivity. Imbalanced lines not only waste machine capacity but also place uneven pressure on workers, which can increase fatigue, defects and absenteeism. From an SWP perspective, such planning decisions represent the scheduling and allocation dimension of workforce planning.

Evidence on HR practices in the RMG sector reveals similar issues. Ali & Barishal (2022) find that recruitment and selection, compensation and benefits, performance management, employee participation, training and HR compliance all show significant positive effects on employee productivity in Bangladeshi RMG factories. Compensation and HR compliance emerge as the strongest predictors of productivity, indicating that fair pay and adherence to labour standards are fundamental to sustained performance (Ali & Barishal, 2022). At the same time, the authors report substantial variation in the extent to which these practices are implemented, suggesting that HR systems remain fragmented and often reactive.

Rashid et al. (2019) similarly conclude that HRM practices in many Bangladeshi garment factories are basic and compliance-oriented, with limited emphasis on strategic planning, skill development or career systems. Newaz et al. (2023) point to skill gaps in key management positions and highlight the need for systematic workforce planning to ensure that critical roles such as production manager, HR manager and compliance manager are filled with individuals who possess the necessary technical and soft skills.

Turnover research reinforces this picture. Hossain and Mahmood (2018) identify low wages, excessive overtime, limited career prospects and poor working conditions as key drivers of employee turnover in garment factories, which in turn disrupts production stability and raises costs. High turnover can be viewed as a symptom of weak SWP, because it indicates that organisations are not effectively matching workforce supply and demand or designing conditions that retain skilled workers.

At a sectoral level, available evidence indicates that many factories lose substantial productive time due to non-productive activities, poor planning and last-minute adjustments to meet buyer deadlines (Habib, 2023; Bangladesh Bank, 2024). While operational tools such as production planning and line balancing exist, they have not yet been widely integrated into a coherent, strategic workforce planning approach that also addresses HR systems and employee outcomes.

2.4 WORKPLACE ENVIRONMENT, WORK ABILITY AND EMPLOYEE OUTCOMES IN THE RMG SECTOR

Alongside production planning, a growing body of research emphasises the importance of workplace environment, work ability and HR practices for employee outcomes and productivity in the RMG sector. Ahmed and Chowdhury (2025) investigate how workplace environment factors – including lighting, ventilation, safety measures, rest facilities, leadership

and communication – influence employee performance in Bangladeshi garment factories. Their survey findings show that a supportive workplace environment is positively associated with both job satisfaction and perceived performance, and they propose a framework that incorporates Herzberg’s two-factor theory, Maslow’s hierarchy of needs and social exchange theory to explain these relationships (Ahmed and Chowdhury, 2025).

Ullah et al. (2024) add further insight by analysing compensation, organisational commitment and job satisfaction among RMG workers using partial least squares structural equation modelling. They find that compensation and organisational commitment both have significant positive effects on job satisfaction, and that job satisfaction and commitment are both significantly related to self-reported work productivity. Job satisfaction partially mediates the relationship between compensation and productivity (Ullah et al., 2024). These results suggest that monetary and relational aspects of HR practices operate through psychological mechanisms such as satisfaction and perceived fairness, which are central to Human Capital Theory and the AMO framework.

Work ability has emerged as another important concept for understanding the link between working conditions and performance. Zohra et al. (2025) examine work ability among female RMG workers in Bangladesh and show that many workers report only moderate work ability. Lower work ability is significantly associated with musculoskeletal symptoms, long working hours, low wages, overtime and high physical workload. The authors conclude that poor ergonomics, repetitive tasks and fatigue reduce productivity and increase the risk of absenteeism and early exit from the labour force (Zohra et al., 2025).

These findings are consistent with the wider occupational health literature. Ilmarinen (2009) defines work ability as the balance between an individual’s resources and job demands, shaped by work environment and organisation, health and functional capacity, and professional competence.

When job demands exceed workers’ physical and mental capacities over time, work ability declines, leading to lower performance and higher health-related costs. Ilmarinen (2009) similarly shows that low work ability predicts early retirement and reduced participation. This framework helps interpret Zohra et al.’s (2025) results: long hours, high physical workload and insufficient recovery time in RMG factories systematically erode work ability and therefore undermine line-level productivity.

Research on HPWS also stresses the importance of climate and engagement. Kloutsiniotis et al., (2021) demonstrate that HPWS in hotel organisations build a justice and service climate that enhances work engagement and service-oriented organisational citizenship behaviour, which then improves performance. Although this study is in hospitality, it supports the argument that HR practices and work environment shape not only output but also employees' willingness to go beyond formal job requirements. In labour-intensive garment production, such discretionary effort may translate into fewer errors, more flexible problem solving and smoother coordination along the line.

Better Work's Gender Equality and Returns (GEAR) programme provides a gendered perspective on workplace environment and career opportunities. Evaluations of GEAR in Bangladesh show that training and promoting women workers into supervisory roles increase line efficiency, with female supervisors outperforming male supervisors by around three to four percentage points on average (Better Work, 2025). The programme improves not only production outcomes but also worker well-being and empowerment, as female supervisors serve as role models and help create more inclusive management structures (Better Work, 2025).

Taken together, these studies indicate that SWP cannot be reduced to numerical staffing models. Decisions about compensation, workplace environment, ergonomics, scheduling, leadership and promotion pathways all affect workers' satisfaction, work ability and retention. In Bangladesh's RMG sector, where long hours, intense workloads and narrow promotion opportunities are common, strategic workforce planning needs to explicitly incorporate these factors.

2.5 STRATEGIC WORKFORCE PLANNING DIMENSIONS IN APPAREL FACTORIES

Drawing on the above evidence and the proposal, this study conceptualises SWP in apparel factories along four main dimensions: manpower forecasting, recruitment and selection, training and skill development, and work scheduling and allocation. The reviewed literature supports the relevance of each dimension to productivity.

Manpower forecasting focuses on anticipating labour demand in line with order volumes, style complexity and production capacity. Habib (2023) notes that frequent changes in buyer orders, product mix and delivery deadlines make production planning difficult in RMG factories, which often leads to some lines being overloaded while others remain underutilised.

Rahman et al. (2024) show that line imbalances and bottlenecks persist even when overall resources are adequate, because tasks and machines are not allocated in line with actual workload. Manpower forecasting that is integrated with capacity planning and line balancing can reduce overtime, idle time and last-minute reliance on temporary workers.

Recruitment and selection determine both the quantity and quality of human capital entering the organisation. Empirical work in the RMG sector suggests that factories often rely on informal recruitment channels and short-term hiring, which can weaken person–organisation fit and long-term commitment (Rashid et al., 2019; Hossain and Mahmood, 2018). Ali & Barishal (2022) shows that recruitment and selection, alongside compensation, performance appraisal and training, significantly influence employee productivity in RMG factories. Better Work’s GEAR experience further indicates that deliberately identifying and promoting women with potential for supervisory roles, and supporting them through structured training, can generate measurable efficiency gains while reducing gender gaps (Better Work, 2025). Recruitment and selection in SWP therefore involve not only filling vacancies, but also ensuring that hires possess the required skills, motivation and leadership potential, with a clear attention to diversity and inclusion.

Training and skill development are consistently highlighted as key levers for productivity. Sheehan and Garavan (2022) find that employee-oriented practices such as training and participative management are associated with higher labour productivity over time in SMEs. In the RMG context, Better Work’s GEAR programme offers compelling evidence that structured supervisory training for female operators improves line efficiency and reduces quality-related costs (Better Work, 2025). Zohra et al. (2025) argue that training on ergonomics, safe handling and coping strategies could mitigate musculoskeletal complaints and improve work ability among female workers. Newaz et al. (2023) show that management roles in the RMG sector require a mix of technical, analytical and interpersonal skills, and call for more systematic skill development pathways for these positions. From a Human Capital Theory viewpoint, such investments in training and skills are expected to yield productivity returns at both individual and factory level.

Work scheduling and allocation represent the operational face of SWP on the factory floor. Habib (2023) identifies job scheduling, line planning and follow-up as key activities influencing lead times and competitiveness. Rahman et al. (2024) demonstrate that better line balancing methods improve balance accuracy, reduce bottlenecks and enhance sewing line

performance. Ahmed and Chowdhury (2025) and Zohra et al. (2025) show that long working hours, poorly distributed overtime and high physical workloads erode job satisfaction and work ability. Job design and scheduling decisions therefore need to consider both technical efficiency and human sustainability.

High-commitment HRM research further suggests that compensation and HR practices that signal long-term commitment can reduce turnover intentions through improved job satisfaction (Rubel and Kee, 2015). This implies that SWP should integrate scheduling and employment practices that provide some predictability and security, rather than relying on chronic overtime and casual labour to absorb demand fluctuations.

Taken together, these four dimensions suggest that SWP in apparel factories is a multi-layered process that spans headcount forecasting, recruitment pipelines, continuous skill development and detailed daily scheduling. The literature indicates that many Bangladeshi factories currently operate in a reactive mode, with fragmented HR practices and ad hoc planning, rather than through proactive SWP grounded in robust forecasting, integrated HR systems and attention to employee well-being (Habib, 2023; Rashid et al., 2019; Ali & Barishal, 2022).

2.6 THEORETICAL FRAMEWORK

The theoretical framework for this study integrates Human Capital Theory and the RBV, operationalised through the AMO perspective on HR systems.

Human Capital Theory posits that investments in education, training and health enhance workers' productive capacities and earnings over time (Becker, 1964). In the RMG sector, Ullah et al. (2024) show that compensation and organisational commitment improve job satisfaction and productivity, which can be interpreted as returns on human capital investments in both financial and relational forms. Training and structured skill development, such as those provided through programmes like GEAR, similarly represent investments aimed at upgrading workers' capabilities and their ability to manage more complex tasks (Better Work, 2025).

The RBV focuses on how organisations create and sustain competitive advantage through resources that are valuable, rare, difficult to imitate and well organised. HR systems can meet these criteria when they build a skilled, motivated and loyal workforce that competitors cannot easily replicate. Sheehan and Garavan (2022) and Huselid (1995) provide evidence that systems of HPWPs – including selective staffing, extensive training, employee involvement

and performance-linked pay – are associated with higher productivity and financial performance across different contexts.

The AMO framework provides a useful bridge between these theories and specific SWP practices. It suggests that HR systems influence performance by enhancing employees' abilities, strengthening their motivation and ensuring that they have opportunities to contribute (Huselid, 1995). In the present study, manpower forecasting and recruitment and selection are viewed as mechanisms for securing and deploying human capital with the required abilities. Training and skill development are the primary channels for upgrading abilities over time. Compensation systems, fair treatment and supportive workplace environments shape motivation, as indicated in studies by Ullah et al. (2024) and Rubel and Kee (2015). Work scheduling and allocation provide opportunities to apply skills productively, with attention to ergonomics and work ability as highlighted by Zohra et al. (2025) and Ilmarinen (2009).

Within this dual theoretical lens, SWP is conceptualised as the process through which factories invest in, deploy and continuously adjust their human capital across the four dimensions outlined above, in order to optimise productivity. The specific empirical studies reviewed earlier on workplace environment (Ahmed and Chowdhury, 2025), production planning (Habib, 2023), line balancing (Rahman et al., 2024), work ability (Zohra et al., 2025), compensation and commitment (Ullah et al., 2024), and women's supervisory training (Better Work, 2025) provide concrete evidence for individual links within this framework. The present study seeks to bring these strands together in a single model.

2.7 RESEARCH GAP AND JUSTIFICATION

Although a number of studies have examined productivity, HR practices and working conditions in Bangladesh's RMG sector, several gaps remain. First, most empirical work focuses on specific elements rather than on SWP as an integrated strategic process. Habib (2023) analyses production planning and its impact on lead time and competitiveness, yet does not link these practices explicitly to recruitment, training or wider HR systems. Rahman et al. (2024) assess the performance of line balancing techniques, but do not examine how line-balancing decisions connect to employee-level outcomes such as satisfaction, work ability or turnover.

On the human side, studies by Ahmed and Chowdhury (2025), Ullah et al. (2024) and Zohra et al. (2025) provide valuable insights into workplace environment, compensation, satisfaction and work ability, but they do not frame these issues within a comprehensive SWP model that

includes forecasting, recruitment, training and scheduling. Ali & Barishal (2022) shows that multiple HRM dimensions influence productivity, yet treats them as a set of practices rather than as part of a structured workforce planning system. Rashid et al. (2019) and Newaz et al. (2023) highlight fragmented HRM practices and skill gaps in key positions, but they do not model how manpower forecasting, skill pipelines and daily scheduling interact to shape productivity. Better Work's evaluations of GEAR demonstrate a compelling business case for training and promoting women supervisors, but focus on a single intervention rather than on how factories plan and manage their workforce as a whole (Better Work, 2025).

Second, there is limited empirical work that simultaneously captures multiple SWP dimensions and links them to concrete productivity indicators at factory level. Much of the international HPWS literature examines productivity or financial performance, but it is often based in developed economy contexts and uses firm-level data that may not capture the granular realities of line-level operations in labour-intensive apparel factories (Huselid, 1995; Sheehan and Garavan, 2022).

Third, existing studies rarely combine employee and management perspectives in a systematic way. The proposal notes that few RMG studies integrate survey data from workers with qualitative insights from managers to understand how SWP practices are enacted in daily operations. Many rely on either worker surveys or management interviews, but not both, which limits understanding of the implementation challenges that arise between planned HR and production systems and actual practices.

Fourth, there is relatively little comparative evidence on factories located in different industrial zones such as Dhaka and Gazipur, even though labour markets, infrastructure and compliance pressures may differ across these locations. Sectoral reports hint at variation in working conditions, turnover and workplace practices between zones, but systematic academic comparison remains limited.

This dissertation addresses these gaps by empirically examining how four SWP dimensions – manpower forecasting, recruitment and selection, training and skill development, and work scheduling and allocation – relate to productivity optimisation in apparel factories in Dhaka and Gazipur. By combining quantitative survey data from workers with qualitative interviews with managers, the study aims to provide a holistic and context-sensitive understanding of how SWP is designed, implemented and experienced, and how it can be strengthened to support sustainable productivity improvements in Bangladesh's garment industry.

2.8 CONCEPTUAL FRAMEWORK AND HYPOTHESES

Based on the reviewed literature and the theoretical framework, the study proposes a conceptual model in which four SWP dimensions act as independent variables and productivity optimisation is the dependent variable. Manpower forecasting captures the extent to which factories anticipate labour demand and align staffing with production plans. Recruitment and selection reflect the processes through which factories attract and choose workers and potential supervisors. Training and skill development represent investments in upgrading employee capabilities and leadership potential. Work scheduling and allocation represent the way tasks and working hours are distributed across workers and lines.

Human Capital Theory suggests that investments in forecasting, recruitment, training and job design should improve worker capabilities and their deployment, thereby enhancing productivity (Becker, 1964; Ullah et al., 2024). The RBV and AMO framework further suggest that when these practices form a coherent system, they can create a valuable and hard-to-imitate human resource base that sustains superior performance (Huselid, 1995; Sheehan and Garavan, 2022). Empirically, this study does not attempt to prove causality but examines whether higher levels of these SWP dimensions are positively associated with higher levels of productivity optimisation in apparel factories.

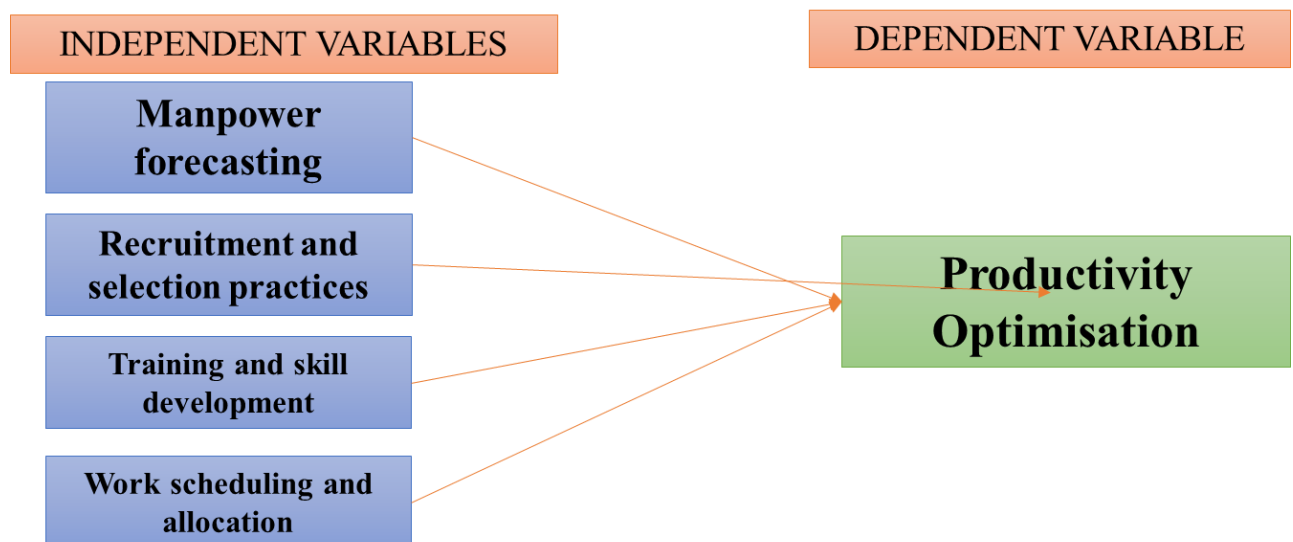


**FIGURE 2.1: CONCEPTUAL FRAMEWORK
(SOURCE: SELF-CREATED)**

From this conceptual framework, the following hypotheses are derived:

- H1: Manpower forecasting is positively associated with productivity optimisation.
- H2: Recruitment and selection practices are positively associated with productivity optimisation.

- H3: Training and skill development are positively associated with productivity optimisation.
- H4: Work scheduling and allocation is positively associated with productivity optimisation.

These hypotheses guide the empirical analysis in the subsequent chapters and provide a structured basis for examining how strategic workforce planning can support productivity improvements in Bangladeshi apparel factories.

2.9 CHAPTER SUMMARY

This chapter has reviewed the theoretical and empirical literature relevant to strategic workforce planning and productivity in the Bangladeshi RMG sector. It clarified the concept of workforce planning and positioned SWP within wider debates on strategic HRM, Human Capital Theory, the Resource-Based View and the AMO framework. The chapter synthesised evidence on production planning, line balancing and HR practices in apparel factories, and examined how workplace environment, compensation, work ability and gendered career pathways shape employee outcomes and line-level performance. On this basis, it identified four core SWP dimensions that are particularly salient for apparel production: manpower forecasting, recruitment and selection, training and skill development, and work scheduling and allocation. The chapter highlighted important research gaps, including the lack of integrated SWP models and limited use of combined worker and management perspectives. It concluded by presenting the conceptual framework and four hypotheses that link SWP dimensions to productivity optimisation, which guide the empirical analysis in subsequent chapters.

CHAPTER THREE: METHODOLOGY

3.1 CHAPTER OVERVIEW

This chapter explains how the study investigates the relationships between strategic workforce planning (SWP) and productivity optimisation in apparel factories in Dhaka and Gazipur. It translates the research aim, objectives and hypotheses into a concrete plan for collecting and analysing data. The chapter first outlines the research philosophy and overall design, then describes the research setting, target populations and sampling strategy. It then details the quantitative worker survey and qualitative manager interviews, including how the instruments are structured around the four SWP dimensions and productivity outcomes. Procedures for quantitative and qualitative data analysis are explained, followed by a discussion of validity, reliability and trustworthiness. The chapter closes with ethical considerations and methodological limitations. This integrated methodology is designed to capture both the measurable links between SWP practices and productivity and the contextual factors that shape implementation in Bangladeshi ready-made garment (RMG) factories (Saunders et al., 2019; Creswell and Plano Clark, 2018).

3.2 RESEARCH PHILOSOPHY AND PARADIGM

Research philosophy refers to the assumptions about reality and knowledge that underpin a study (Saunders et al., 2019). Positivism views reality as objective and independent of the researcher, and favours measurement, hypothesis testing and statistical analysis (Bryman and Bell, 2015). Interpretivism, in contrast, emphasises the social construction of reality and seeks to understand meanings, experiences and interpretations, usually through qualitative methods (Creswell and Creswell, 2018).

This study adopts a pragmatic paradigm. Pragmatism rejects the need to choose exclusively between positivist and interpretivist positions and instead focuses on what combination of methods will best address the research problem (Tashakkori and Teddlie, 2010). Pragmatists accept that both quantitative indicators and qualitative insights can contribute to useful knowledge, particularly in applied fields such as management and HRM.

Pragmatism is appropriate here for three reasons. First, the study examines hypotheses about the relationships between four SWP dimensions and productivity optimisation, which requires structured measurement and statistical analysis in line with a more positivist logic. Second, it seeks to understand how managers in Dhaka and Gazipur actually design and implement SWP, which calls for interpretive exploration of context and meaning. Third, the ultimate aim is to

generate actionable recommendations for factories and policymakers, which aligns with the pragmatic focus on practical consequences (Morgan, 2014).

3.3 RESEARCH DESIGN AND APPROACH

Research design provides the overall strategy for connecting research questions with data collection and analysis (Yin, 2018). Designs are often categorised as quantitative, qualitative or mixed methods. Mixed-methods designs purposefully integrate both numerical and narrative data in a single study to gain a more complete understanding of complex phenomena (Creswell and Plano Clark, 2018).

This research uses an explanatory sequential mixed-methods design. In this type, quantitative data are collected and analysed first, followed by qualitative data that help explain and deepen the initial results (Creswell and Plano Clark, 2018). Phase one consists of a structured survey of workers and lower-level supervisors using the questionnaire on SWP practices and productivity. Phase two consists of semi-structured interviews with managers that explore planning, recruitment, training, scheduling and productivity in more detail.

The study combines a mainly deductive approach in the quantitative phase, where hypotheses derived from Human Capital Theory, the Resource-Based View and the AMO framework are tested, with a more inductive element in the qualitative phase, where themes are generated from managers' accounts (Saunders et al., 2019). The time horizon is cross-sectional, because data are collected at a single point in time rather than longitudinally. This design is suitable for examining current SWP practices and perceived productivity outcomes in RMG factories under real operational constraints.

3.4 RESEARCH SETTING AND TARGET POPULATION

The empirical setting is the ready-made garments sector in Bangladesh, with a focus on woven and knit apparel factories in Dhaka and Gazipur. These clusters host a high density of export-oriented factories, subcontractors and support services, and are central to national export earnings and employment, as outlined in Chapter One. They also face the planning, HR and work ability challenges highlighted in Chapter Two, such as volatile orders, line imbalances and high turnover.

Two main populations are targeted. The first population comprises production workers and lower-level supervisors working in cutting, sewing, finishing and quality sections. Their perceptions of workforce planning practices and productivity outcomes are captured through

the worker survey. The second population includes HR managers, production managers, industrial engineers, compliance managers and senior supervisors responsible for planning, staffing and line performance. Their perspectives are gathered through semi-structured interviews.

Studying both groups allows the research to link line-level experiences of SWP and productivity with managerial strategies and constraints. This dual perspective responds to calls for integrated worker and management views in the RMG literature (Rashid et al., 2019; Ali, 2022).

3.5 SAMPLING STRATEGY AND SAMPLE SIZE

Sampling concerns how units are selected from a population for study. Probability sampling gives each unit a known chance of selection, supporting statistical generalisation, while non-probability sampling selects units based on judgement or convenience, which is common in organisational research where access is negotiated (Saunders et al., 2019).

This study uses non-probability sampling at three levels. First, up to five apparel factories in Dhaka and Gazipur are selected using purposive sampling, based on criteria such as export orientation, product type, size and willingness to participate. Purposive sampling is appropriate when the aim is to study information-rich cases rather than produce sector-wide estimates (Patton, 2015).

Second, within each factory, workers and lower-level supervisors are selected using a mix of purposive and convenience sampling, aiming for diversity across departments and roles. The target is to obtain a sufficient number of usable responses, for example around 120–200 questionnaires, to permit descriptive statistics, reliability analysis and basic regression (Field, 2018).

Third, managers for interviews are selected purposively to include those directly involved in workforce planning and productivity. Around 10–15 interviews are expected to be sufficient to reach thematic saturation, where new interviews add little new information (Guest et al., 2006). Although non-probability sampling limits statistical generalisability, it is justified by access constraints and the exploratory, context-sensitive aims of the research.

3.6 DATA COLLECTION METHODS

Data collection uses two complementary methods aligned with the research questions and conceptual framework: a structured worker survey and semi-structured interviews with

managers. This combination reflects the pragmatic view that no single method is sufficient to understand how SWP practices operate and how they influence productivity in complex organisational settings (Tashakkori and Teddlie, 2010; Creswell and Plano Clark, 2018).

3.6.1 WORKER SURVEY QUESTIONNAIRE

The worker survey is a structured self-administered questionnaire, a widely used tool for measuring attitudes and perceptions across larger samples in HRM and organisational research (Bryman and Bell, 2015). The instrument is explicitly aligned with the four SWP dimensions and the productivity construct developed in Chapter Two. Section A gathers background information on factory code, location, gender, age group, position, department, employment type, total RMG experience and tenure in the current factory, which allows profiling and subgroup analysis. Sections B–E measure manpower forecasting, recruitment and selection, training and skill development, and work scheduling and allocation. Items capture issues such as advance planning of staffing, matching of skills to lines, the adequacy of training, and predictability and fairness of working hours and breaks. Section F assesses productivity and performance outcomes, including clarity of targets, achievement of daily output, material flow, quality problems, cross-departmental coordination and efficient use of people, machines and time. All items use a five-point Likert scale from 1 “strongly disagree” to 5 “strongly agree”, which supports scale construction and statistical analysis (DeVellis, 2017). Items draw on prior research on HPWPs, workplace environment, work ability and RMG productivity, but are adapted into accessible language. A pilot test with a small group of workers will be conducted to refine wording and layout and enhance content validity (Saunders et al., 2019). Where necessary, the questionnaire will be translated into Bangla and back-translated to ensure meaning is preserved.

3.6.2 SEMI-STRUCTURED INTERVIEWS WITH MANAGERS

The qualitative component consists of semi-structured interviews with managers and senior supervisors. Semi-structured interviews use a flexible guide with open questions and are suitable for exploring how complex practices such as SWP are interpreted and implemented in specific organisational contexts (Kvale and Brinkmann, 2015). The interview schedule begins with an introductory question on the participant’s role and tenure, then focuses on planning and staffing, recruitment and placement, training and development, scheduling and productivity, and suggested improvements in workforce planning. Interviews of around 30–45 minutes will be conducted in Bangla, English or both, depending on preference. With consent, interviews

will be audio recorded and transcribed, or detailed notes will be taken. Short follow-up prompts such as “Can you give an example?” or “Why do you think so?” will be used to elicit richer detail. This method supports inductive identification of themes related to enabling and constraining factors in SWP (Braun and Clarke, 2006) and provides depth to complement the survey findings.

3.7 DATA ANALYSIS, VALIDITY, RELIABILITY AND TRUSTWORTHINESS

Quality assurance begins at the design stage. For the quantitative survey, content validity is supported by building the questionnaire on established work on SWP, HPWPs, workplace environment, work ability and productivity, and aligning all items with the four SWP dimensions and the productivity construct defined in Chapter Two (DeVellis, 2017; Saunders et al., 2019). A small pilot with workers will be used to check clarity, relevance and length, and to adjust wording where needed. For the qualitative interviews, an interview guide structured around the same core themes (planning, recruitment, training, scheduling, productivity and improvements) helps ensure good coverage of the conceptual framework. Before full data collection, the guide will be tested informally with at least one manager or academic to refine question order and phrasing (Kvale and Brinkmann, 2015).

During and after data collection, additional steps strengthen reliability and trustworthiness. For the survey, careful training on how to approach respondents, consistent instructions and anonymous administration reduce interviewer and social desirability bias. For interviews, rapport building, clear explanation of confidentiality and active listening support credible and honest accounts. Reflexive notes will be kept to record contextual factors and the researcher’s own assumptions (Lincoln and Guba, 1985).

Quantitative data from the worker survey will be coded and entered into SPSS. Data preparation will involve checking for missing values, outliers and entry errors (Field, 2018). Descriptive statistics will be produced for all variables. Items from Sections B–F will be combined into composite scales for manpower forecasting, recruitment and selection, training and skill development, work scheduling and allocation, and productivity optimisation. Internal consistency will be assessed using Cronbach’s alpha, with coefficients of 0.70 or above indicating acceptable reliability (DeVellis, 2017). Pearson correlations will examine the strength and direction of associations between SWP dimensions and productivity, and multiple regression will be used to test hypotheses H1–H4 regarding these associations, while monitoring assumptions such as linearity and multicollinearity (Field, 2018).

Qualitative interview data will be analysed using thematic analysis (Braun and Clarke, 2006). Transcripts will be read repeatedly, coded, and then organised into themes such as reactive planning, training gaps or overtime driven productivity. Credibility will be enhanced by grounding themes in direct quotations and checking interpretations against the full dataset. Finally, triangulation between survey patterns and interview themes will strengthen overall validity, because convergence of different data sources increases confidence in the findings (Tashakkori and Teddlie, 2010; Creswell and Plano Clark, 2018).

3.8 ETHICAL CONSIDERATIONS

Ethical conduct is essential in research involving human participants, especially workers whose employment conditions may already be precarious. The study will follow the ethical guidelines of the host university and recognised principles of social research ethics (Bryman and Bell, 2015; Saunders et al., 2019).

Participation in both survey and interviews will be voluntary. Participants will receive information sheets explaining the study's purpose, procedures, potential risks and benefits, and their rights, including the right to decline or withdraw at any time without consequence. Informed consent will be obtained before data collection, either in written or verbal form, depending on literacy and context.

Confidentiality and anonymity will be strictly maintained. Factories will be identified only by codes, and individuals will not be named in the dissertation. Questionnaires will avoid personally identifying information, and pseudonyms or role descriptions will be used in interview transcripts and reporting. Data will be stored securely on password protected devices and will be retained and disposed of in line with institutional policies.

Care will be taken to minimise any risk of harm. Surveys will be administered during breaks or after working hours, and it will be emphasised that responses will not be shared with management in an identifiable form. Interview questions will focus on practices and systems rather than attributing blame to individuals.

3.9 METHODOLOGICAL LIMITATIONS

Every methodological choice involves trade-offs. This study's use of non-probability sampling and a limited number of factories in Dhaka and Gazipur means that the quantitative results cannot be statistically generalised to all RMG factories in Bangladesh. Instead, the findings

should be viewed as analytically generalisable to similar contexts, in the sense that they may inform theory and practice in comparable settings (Yin, 2018).

The cross-sectional design captures perceptions and relationships at one point in time and cannot reveal how SWP practices and productivity evolve over longer periods or in response to shocks, such as changes in buyer demand or wage regulations. Because all SWP and productivity variables are measured using a single cross-sectional worker survey, the quantitative analysis can identify statistical associations but cannot establish causal relationships between SWP practices and productivity optimisation. There is also a risk of common method variance, although assurances of anonymity, careful item wording and separation of sections in the questionnaire are intended to reduce this risk. Reliance on self-reported survey data also raises the possibility of social desirability bias or under-reporting of problems, despite assurances of confidentiality. Access constraints may limit the availability of objective performance indicators from factory records.

Despite these limitations, the chosen methodology is appropriate for the aims of the study. It allows a rich, context sensitive examination of SWP practices and perceived productivity while providing enough quantitative structure to test the conceptual framework and generate practical recommendations.

3.10 CHAPTER SUMMARY

This chapter has set out the research methodology for examining strategic workforce planning and productivity optimisation in apparel factories in Dhaka and Gazipur. Guided by a pragmatic paradigm, the study uses an explanatory sequential mixed-methods design that combines a structured worker questionnaire with semi-structured interviews with managers. The chapter has described the research setting, non-probability sampling strategy, survey instrument and interview schedule, and has outlined the procedures for quantitative and qualitative data analysis. Issues of validity, reliability, trustworthiness, ethics and methodological limitations have been discussed. These methodological foundations support the presentation of empirical analysis and findings in the next chapter, where the hypotheses are tested and the views of workers and managers are brought together to answer the research questions.

CHAPTER 4: DATA ANALYSIS AND FINDINGS

4.1 CHAPTER OVERVIEW

This chapter presents the findings of the study and reports the outcomes of both the quantitative and qualitative phases. It begins with the quantitative analysis of survey data collected from apparel factory employees in Dhaka and Gazipur. After screening the initial 184 responses, a final dataset of 139 usable cases was retained for analysis. The quantitative section reports the respondent demographic profile, descriptive statistics for the key constructs, and reliability results using Cronbach's alpha. It then examines relationships between strategic workforce planning dimensions and productivity through Pearson correlation analysis, followed by multiple regression to test the combined predictive power of manpower forecasting, recruitment and selection, training and skill development, and work scheduling and allocation. The chapter also summarises the qualitative thematic findings from interviews and integrates both strands through triangulation, providing a clear evidence base for interpretation in Chapter

4.2 QUANTITATIVE ANALYSIS

For quantitative analysis, a total of 184 survey responses were initially collected through the online questionnaire. Prior to analysis, the dataset was screened to ensure accuracy, completeness, and suitability for statistical testing. The screening process focused on removing duplicate submissions, incomplete cases with substantial missing responses, and invalid or inconsistent entries (for example, contradictory demographic selections or response patterns that indicated the questionnaire was not completed properly). After applying these screening criteria, 139 responses remained and were retained as the final usable dataset for quantitative analysis. This cleaning step improved the reliability of the findings by ensuring that all statistical results are based on complete and credible responses, with reduced risk of bias arising from duplicated or low-quality data.

TABLE 4.1: DATA SCREENING OUTCOMES AND FINAL SAMPLE SIZE

Screening stage	Excluded (n)	Remaining (n)
Initial responses received	—	184
Remove duplicate submissions	12	172
Remove incomplete cases	18	154
Remove invalid/inconsistent cases	15	139
Final usable dataset	45	139

4.2.1 DEMOGRAPHIC ANALYSIS

A total of 139 usable survey responses were analysed following data screening and cleaning. Table 4.2 summarises the demographic profile of respondents using frequencies and percentages.

TABLE 4.2: DEMOGRAPHIC PROFILE OF SURVEY RESPONDENTS (N = 139)

Demographic variable	Category	Frequency (n)	Percentage (%)
Factory location (A2)	Dhaka	97	69.8
	Gazipur	42	30.2
Gender (A3)	Male	94	67.6
	Female	45	32.4
Age group (A4)	18–24	34	24.5
	25–29	27	19.4
	30–34	30	21.6
	35–39	29	20.9
	40 and above	19	13.7
Current position (A5)	Sewing operator	53	38.1
	Quality inspector	40	28.8
	Line chief / Line in-charge	16	11.5
	Supervisor / Junior supervisor	15	10.8
	Helper	14	10.1
Department / Section (A6)	Other	1	0.7
	Sewing	53	38.1
	Cutting	42	30.2
	Finishing / Packing	28	20.1
	Quality	16	11.5
Employment type (A7)	Permanent	114	82.0
	Probation / Contract	20	14.4
	Casual / Temporary	5	3.6
Total years in the RMG sector (A8)	4–6 years	49	35.3
	1–3 years	32	23.0
	7–10 years	26	18.7
	More than 10 years	23	16.5
	Less than 1 year	9	6.5
Years working in this factory (A9)	1–3 years	46	33.1
	More than 6 years	43	30.9
	4–6 years	29	20.9
	Less than 1 year	21	15.1
	SSC / Equivalent	44	31.7
Highest education level completed (A10)	Primary	31	22.3
	Diploma / Graduate or above	20	14.4
	HSC / Equivalent	20	14.4
	Secondary (class 6–10)	16	11.5
	Other	8	5.8

The sample includes participants from both targeted apparel manufacturing clusters. Most responses were collected from Dhaka (n = 97, 69.8%), while Gazipur accounted for 30.2% (n = 42) (Figure 4.1). This provides coverage across both industrial zones, although the larger Dhaka share suggests that the quantitative results may reflect Dhaka-based operational conditions more strongly.

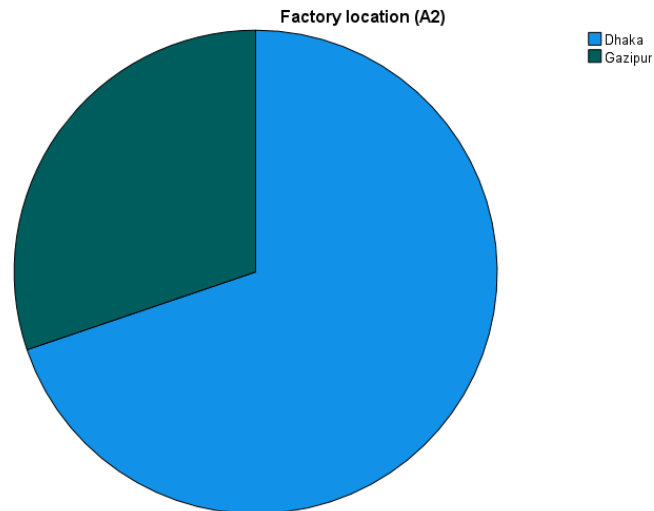


FIGURE 4.1: RESPONDENT DISTRIBUTION BY FACTORY LOCATION (DHAKA VS GAZIPUR)
 Gender distribution shows male respondents formed the majority (67.6%, $n = 94$), while female respondents represented 32.4% ($n = 45$). This pattern is consistent with male dominance in several technical and supervisory roles across factory operations (Figure 4.2). The age profile indicates a predominantly working-age workforce, with the largest proportions in 18–24 (24.5%), 30–34 (21.6%), and 35–39 (20.9%). The age structure is relevant because workforce planning and productivity practices are typically experienced directly by employees in early- to mid-career stages (Figure 4.3).

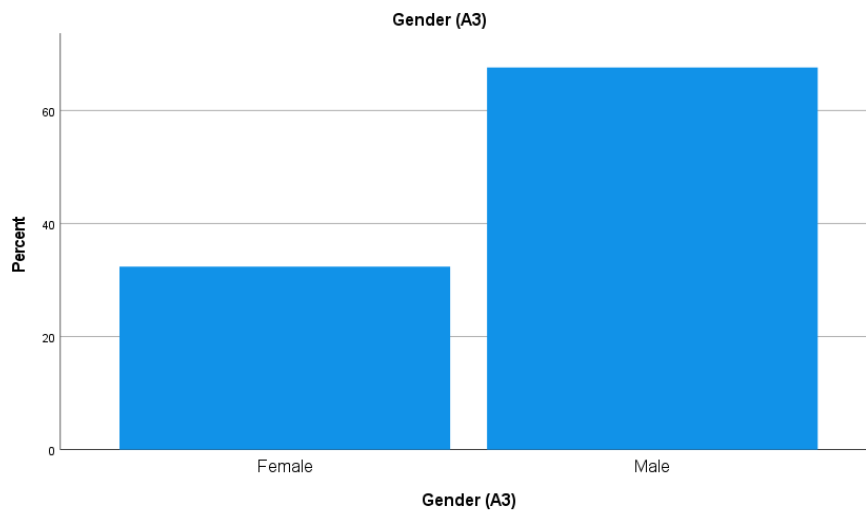


FIGURE 4.2: GENDER DISTRIBUTION OF RESPONDENTS

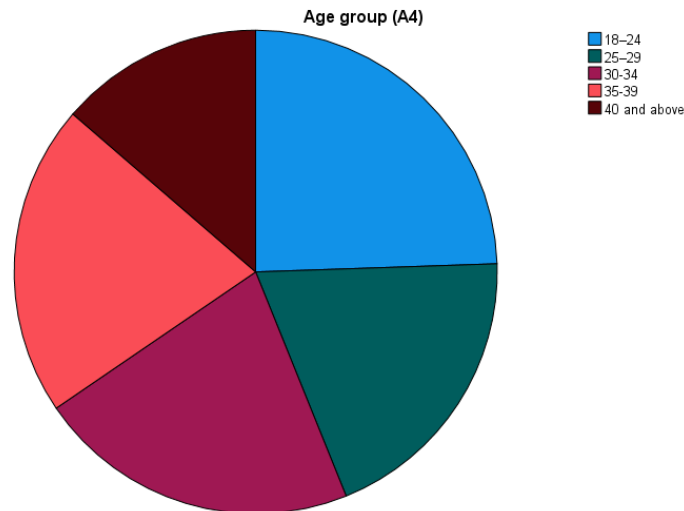


FIGURE 4.3: AGE GROUP DISTRIBUTION OF RESPONDENTS

Respondents were strongly production-floor oriented. The largest group was sewing operators (38.1%), followed by quality inspectors (28.8%), while line chiefs/line in-charges (11.5%) and supervisors/junior supervisors (10.8%) contributed line-management perspectives (Figure 4.4).

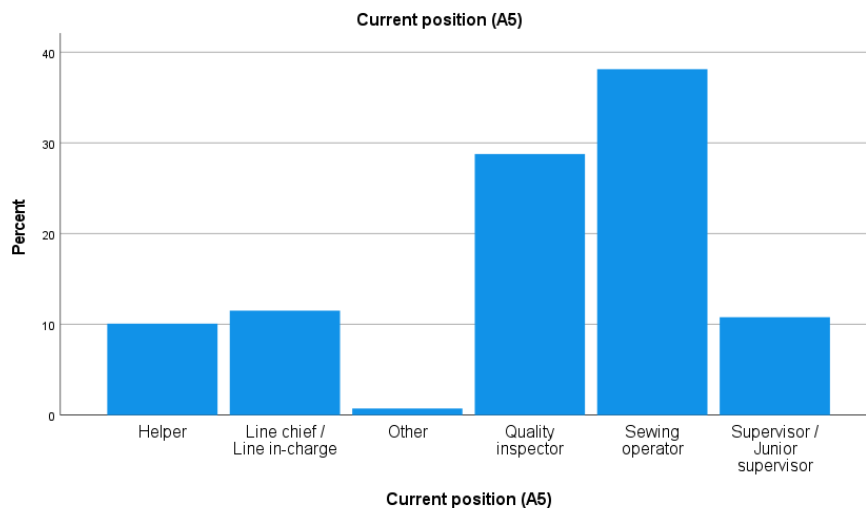


FIGURE 4.4: RESPONDENTS BY JOB POSITION

Departmental representation was also concentrated in core production functions (Sewing 38.1%, Cutting 30.2%, Finishing/Packing 20.1%, Quality 11.5%), presented in Figure 4.5. Most respondents were permanently employed (82.0%), shown in Figure 4.6.

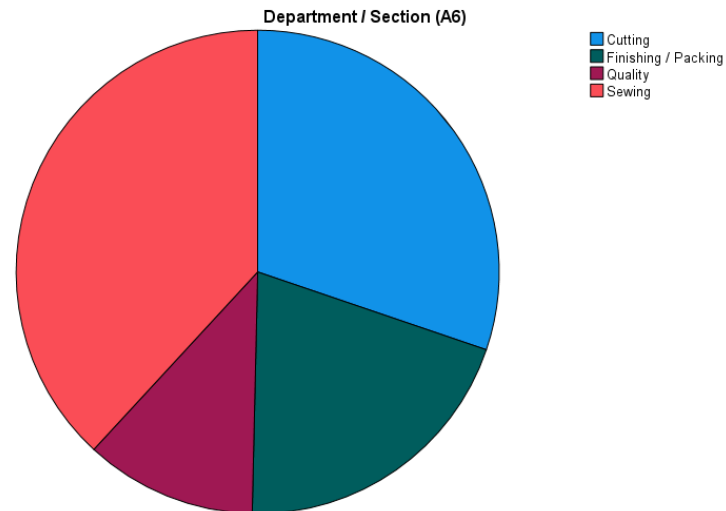


FIGURE 4.5: RESPONDENTS BY DEPARTMENT/SECTION

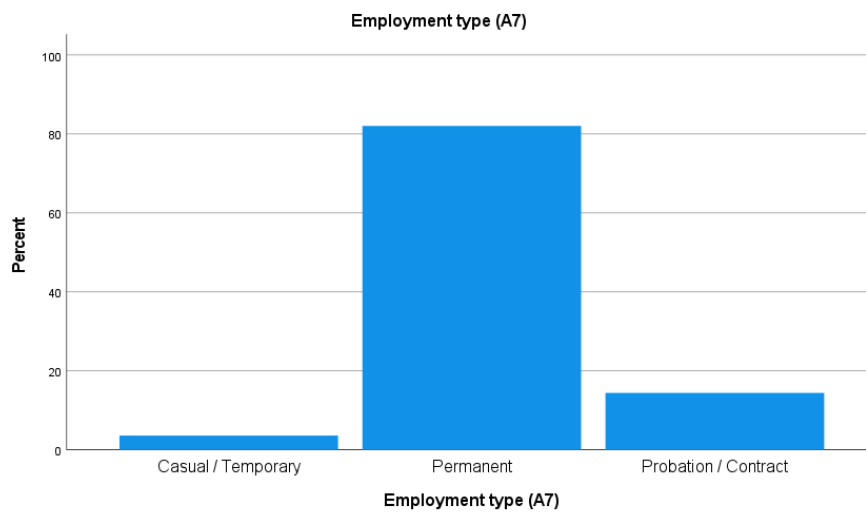


FIGURE 4.6: EMPLOYMENT TYPE OF RESPONDENTS

In terms of experience levels, it is found that a substantial share had 4–6 years of sector experience (35.3%) and 7–10+ years combined (35.2%), supporting the credibility of respondents' perceptions of workforce planning and productivity practices (Figure 4.7).

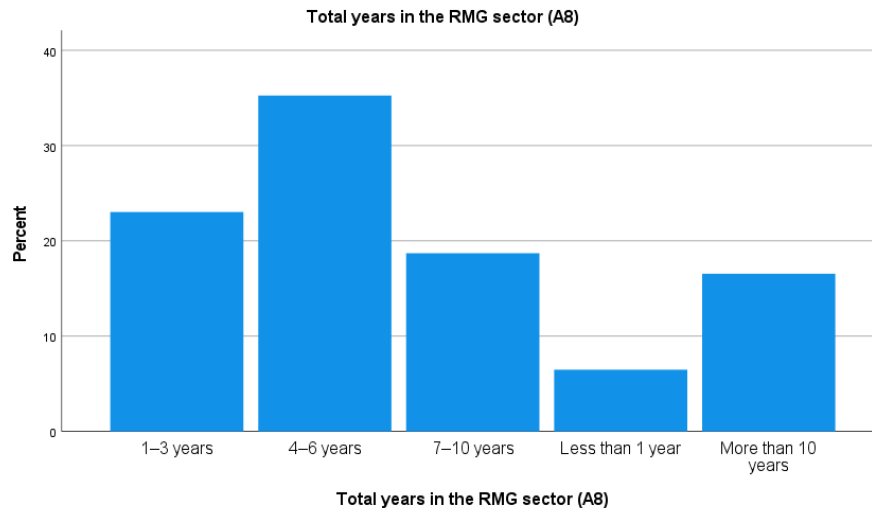


FIGURE 4.7: TOTAL YEARS OF EXPERIENCE IN THE RMG SECTOR

Most respondents reported 1–3 years of tenure (33.1%, n = 46) or more than 6 years (30.9%, n = 43), indicating a mix of relatively new and long-serving employees whose views reflect both recent and established factory practices (Figure 8).

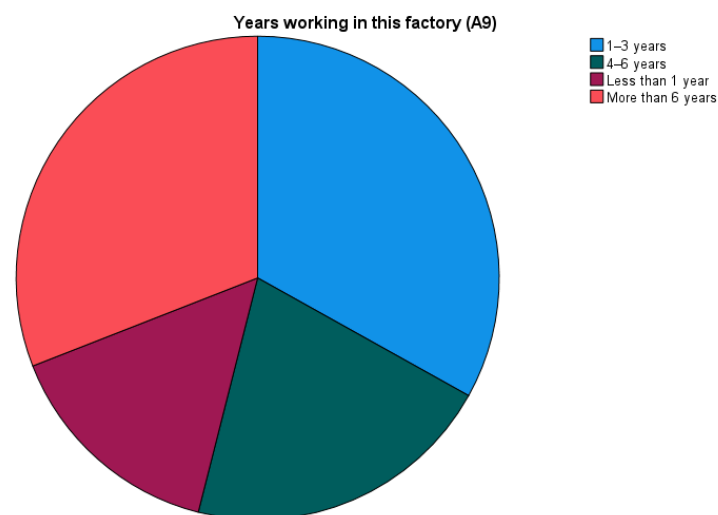


FIGURE 4.8: YEARS WORKING IN THE CURRENT FACTORY

Finally, Figure 4.9 shows the largest share of respondents completed SSC/equivalent (31.7%, n = 44), followed by primary education (22.3%, n = 31), while HSC and diploma/graduate or above each accounted for 14.4% (n = 20), suggesting a workforce with diverse educational backgrounds relevant to training and skill development needs.

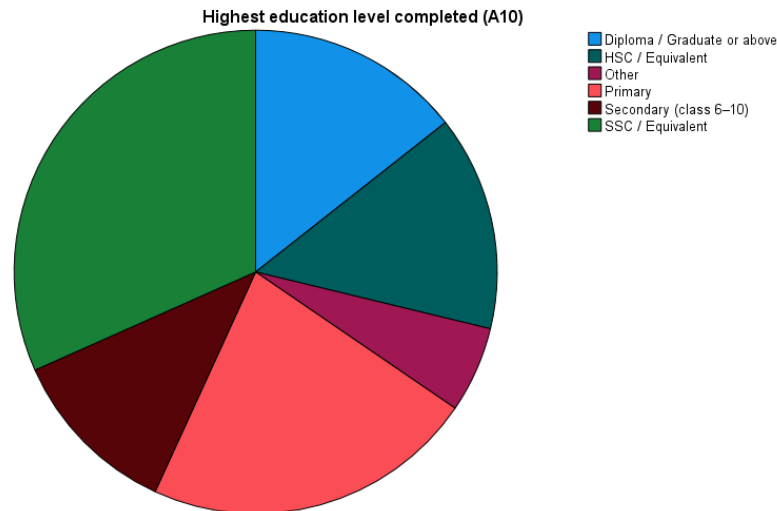


FIGURE 4.9: HIGHEST EDUCATION LEVEL COMPLETED BY RESPONDENTS (IF YOU ALSO WANT A FIGURE FOR EDUCATION)

4.2.2 DESCRIPTIVE ANALYSIS

This section presents descriptive statistics; the results indicate generally positive perceptions of strategic workforce planning practices and productivity among respondents. Manpower forecasting recorded a mean of 3.8604 (SD = 0.68426), while recruitment and selection showed a similar mean of 3.8619 (SD = 0.67453). Training and skill development achieved a slightly higher mean of 3.9698 (SD = 0.53887), suggesting comparatively stronger perceptions of training-related practices, with responses also showing lower variability.

TABLE 4.3: DESCRIPTIVE STATISTICS OF KEY CONSTRUCTS

	N	Minimum	Maximum	Mean	Std. Deviation
Manpower Forecasting	139	1.60	5.00	3.8604	.68426
Recruitment and Selection	139	1.60	5.00	3.8619	.67453
Training and Skill Development	139	2.20	5.00	3.9698	.53887
Work Scheduling and Allocation	139	1.60	5.00	3.8000	.74794
Productivity	139	2.60	5.00	3.9971	.55690
Valid N (listwise)	139				

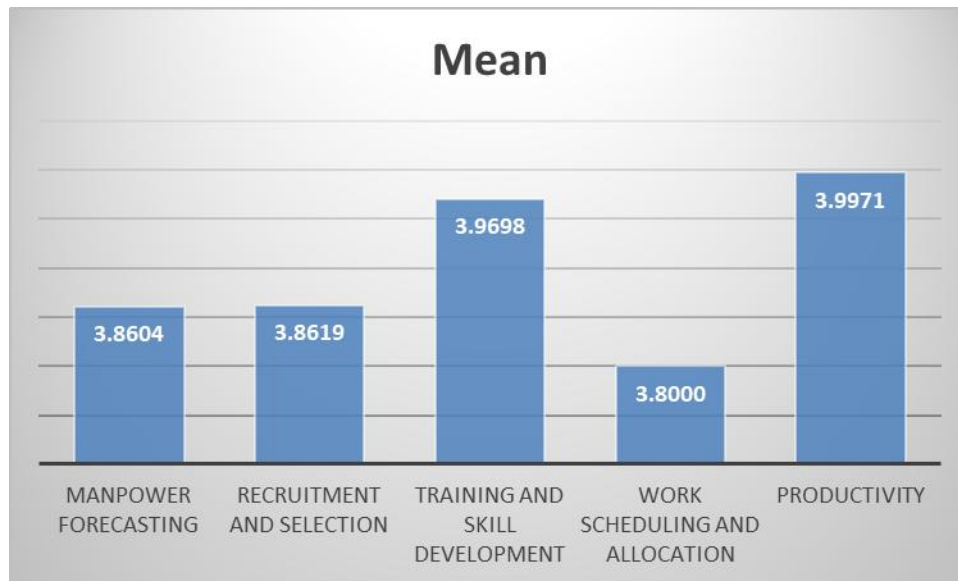


FIGURE 4.10: MEAN OF THE KEY CONSTRUCTS

Work scheduling and allocation reported the lowest mean among the workforce planning dimensions ($M = 3.8000$, $SD = 0.74794$), indicating greater variation in respondent views on how scheduling and allocation are managed. Productivity, measured as a composite construct, recorded the highest mean score ($M = 3.9971$, $SD = 0.55690$), implying that participants generally agreed their factories demonstrate productivity-related outcomes. Overall, the minimum and maximum values (ranging from 1.60 to 5.00 across variables) show that responses covered the full scale, supporting meaningful variation for subsequent correlation and regression analysis.

4.2.3 RELIABILITY ANALYSIS

Scale reliability was assessed using Cronbach's alpha to confirm the internal consistency of the five-item measures for each construct. Cronbach's alpha is widely used in survey-based research to evaluate whether items within a scale consistently measure the same underlying concept (Cronbach, 1951). As shown in Table 4.4, manpower forecasting ($\alpha = 0.729$) and recruitment and selection ($\alpha = 0.738$) demonstrate acceptable reliability, while work scheduling and allocation shows strong internal consistency ($\alpha = 0.774$). Productivity optimisation recorded the highest reliability ($\alpha = 0.804$), indicating a robust and coherent scale. Training and skill development produced a moderate alpha ($\alpha = 0.641$), which is still considered usable in exploratory social research contexts where constructs can be multi-dimensional and respondents may vary in interpretation (Nunnally and Bernstein, 1994). Overall, the reliability results indicate that the measures are sufficiently consistent to support further correlation and regression analyses.

TABLE 4.4: RELIABILITY ANALYSIS

Construct	Items (n)	Cronbach's alpha (α)
Manpower Forecasting (MF)	5	0.729
Recruitment and Selection (RS)	5	0.738
Training and Skill Development (TSD)	5	0.641
Work Scheduling and Allocation (WSA)	5	0.774
Productivity Optimisation (PO)	5	0.804

4.2.4 CORRELATION ANALYSIS

Correlation analysis was used to examine the strength and direction of association between the study variables (Field, 2018). Pearson's product-moment correlation was selected for the study as the analysis is based on composite mean scores derived from multiple Likert-scale items, treated as continuous variables, and the study aims to assess linear relationships among the constructs (Pallant, 2020). All correlations were tested using two-tailed significance at the 0.01 level.

TABLE 4.5: CORRELATION MATRIX

		Manpower Forecasting	Recruitment and Selection	Training and Skill Development	Work Scheduling and Allocation	Productivity
Manpower Forecasting	Pearson Correlation	1	.369**	.761**	.398**	.858**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	139	139	139	139	139
Recruitment and Selection	Pearson Correlation	.369**	1	.233**	.969**	.238**
	Sig. (2-tailed)	.000		.006	.000	.005
	N	139	139	139	139	139
Training and Skill Development	Pearson Correlation	.761**	.233**	1	.234**	.886**
	Sig. (2-tailed)	.000	.006		.005	.000
	N	139	139	139	139	139
Work Scheduling and Allocation	Pearson Correlation	.398**	.969**	.234**	1	.223**
	Sig. (2-tailed)	.000	.000	.005		.008
	N	139	139	139	139	139
Productivity	Pearson Correlation	.858**	.238**	.886**	.223**	1
	Sig. (2-tailed)	.000	.005	.000	.008	
	N	139	139	139	139	139

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

The results show statistically significant positive relationships between each strategic workforce planning dimension and productivity. Manpower forecasting demonstrated a strong positive correlation with productivity ($r = 0.858$, $p < 0.001$), indicating that better forecasting practices are associated with higher perceived productivity outcomes. Training and skill development showed the strongest correlation with productivity ($r = 0.886$, $p < 0.001$), suggesting that improved training practices are closely linked to productivity optimisation.

Recruitment and selection was positively correlated with productivity, although the relationship was comparatively weak ($r = 0.238$, $p = 0.005$). Work scheduling and allocation also showed a weak but significant positive relationship with productivity ($r = 0.223$, $p = 0.008$). Overall, these findings provide quantitative support that stronger workforce planning practices are associated with improved productivity, justifying the subsequent regression analysis.

4.2.5 REGRESSION ANALYSIS

Multiple regression analysis was conducted to examine the relationship between the strategic workforce planning dimensions (manpower forecasting, recruitment and selection, training and skill development, and work scheduling and allocation) and the dependent variable, productivity. The model summary in Table 4.5 indicates a strong overall fit, with a high correlation between observed and predicted values ($R = .941$) and substantial explanatory power ($R^2 = .886$; adjusted $R^2 = .882$). This suggests that the selected workforce planning variables jointly explain a large proportion of variance in productivity within the sampled apparel factories.

TABLE 4.5: MULTIPLE REGRESSION MODEL SUMMARY FOR PREDICTING PRODUCTIVITY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.941 ^a	.886	.882	.19119

a. Predictors: (Constant), Work Scheduling and Allocation , Training and Skill Development, Manpower Forecasting, Recruitment and Selection

b. Dependent Variable: Productivity

The ANOVA results (Table 4.6) confirm that the model is statistically significant, $F(4, 134) = 259.209$, $p < .001$, meaning that the predictors, taken together, reliably predict productivity beyond what would be expected by chance. In addition, the residual diagnostics support the normality assumption, as the residual distribution appears approximately normal in Figure 4.11 and the P–P plot points largely follow the diagonal reference line in Figure 4.12.

TABLE 4.6: ANOVA RESULTS FOR THE REGRESSION MODEL PREDICTING PRODUCTIVITY

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	37.901	4	9.475	259.209	.000 ^b
	Residual	4.898	134	.037		
	Total	42.799	138			

a. Dependent Variable: Productivity

b. Predictors: (Constant), Work Scheduling and Allocation , Training and Skill Development, Manpower Forecasting, Recruitment and Selection

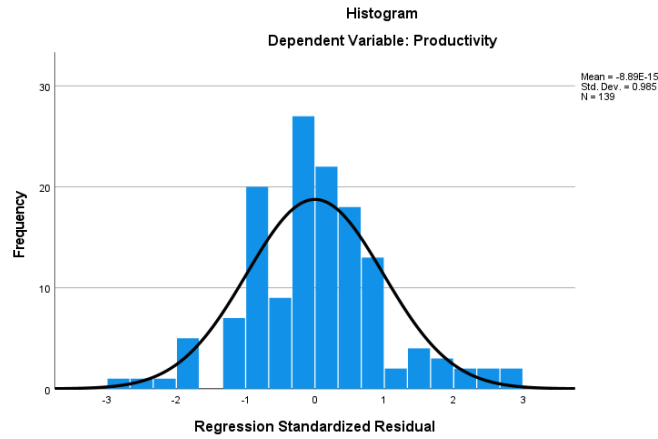


FIGURE 4.11: HISTOGRAM OF REGRESSION STANDARDISED RESIDUALS FOR THE PRODUCTIVITY MODEL

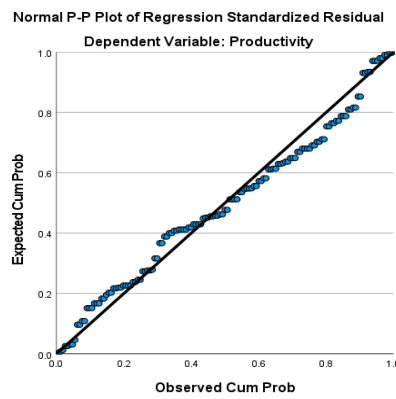


FIGURE 4.12: NORMAL P-P PLOT OF REGRESSION STANDARDISED RESIDUALS FOR THE PRODUCTIVITY MODEL

The coefficients table (Table 4.7) shows that manpower forecasting ($\beta = .512$, $p < .001$), recruitment and selection ($\beta = .453$, $p < .001$), and training and skill development ($\beta = .518$, $p < .001$) have significant positive effects on productivity. Work scheduling and allocation also shows a statistically significant relationship ($\beta = -.542$, $p < .001$), indicating an inverse association in the presence of the other predictors. Overall, the regression results provide empirical support for assessing the hypotheses linking workforce planning practices to productivity outcomes.

TABLE 4.7: REGRESSION COEFFICIENTS FOR STRATEGIC WORKFORCE PLANNING DIMENSIONS PREDICTING PRODUCTIVITY

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	.351	.143		2.454	.015
	Manpower Forecasting	.417	.040	.512	10.545	.000
	Recruitment and Selection	.374	.098	.453	3.813	.000
	Training and Skill Development	.535	.047	.518	11.326	.000
	Work Scheduling and Allocation	-.403	.090	-.542	-4.481	.000

a. Dependent Variable: Productivity

4.3 QUALITATIVE ANALYSIS

4.3.1 INTERVIEW PARTICIPANT PROFILE

A total of eight semi-structured interviews were conducted to support the qualitative phase of this study and to deepen understanding of the quantitative findings. Participants were selected through purposive sampling because they hold direct responsibility for strategic workforce planning (SWP) activities and their implementation within apparel factory operations.

TABLE 4.8: INTERVIEW PARTICIPANT SUMMARY

Participant ID	Factory location	Job role / function	Level	Years in RMG sector	Primary responsibility (focus area)	SWP
P1	Dhaka	HR Officer & (Recruitment records)	Management support	8	Recruitment pipeline, attendance/turnover tracking	
P2	Dhaka	Production Manager	Senior management	14	Manpower planning against order volume, daily output targets	
P3	Dhaka	IE Officer (Line balancing)	Technical specialist	7	Capacity planning, SMV-based line allocation, bottleneck control	
P4	Dhaka	Training/Compliance Officer	Specialist	9	Skills training, SOP/quality training, onboarding routines	
P5	Dhaka	Line Chief / Line In-charge	Frontline leadership	11	Daily worker deployment, absentee cover, overtime coordination	
P6	Gazipur	HR/Admin Executive	Management support	10	Selection screening, onboarding, retention issues	
P7	Gazipur	Senior Supervisor (Sewing)	Frontline leadership	12	Shift scheduling, productivity monitoring, work distribution	
P8	Gazipur	IE/Planning Executive	Technical specialist	6	Forecasting manpower needs, line plan adjustments with style changes	

As summarised in Table 4.8, the interview sample covers both study locations, with five participants from Dhaka (P1–P5) and three from Gazipur (P6–P8), allowing comparison across two major production clusters. The participants represent a balanced mix of roles across HR, production, industrial engineering (IE), training/compliance, and frontline supervision. This role diversity strengthens the credibility of the qualitative evidence by capturing both decision-making and execution perspectives related to manpower forecasting, recruitment and selection, training and skill development, and work scheduling and allocation. Experience levels ranged from 6 to 14 years in the RMG sector (Table 4.8), ensuring that responses reflect informed operational insights.

4.3.2 THEMATIC ANALYSIS

THEME 1: FORECASTING IS MOSTLY REACTIVE, NOT STRATEGIC

Interview evidence suggests that manpower forecasting is necessary for organising production, but it operates as a short-horizon, adjustment-driven activity rather than a stable forward plan. Participants described forecasting as built from order volume, SMV, capacity and target efficiency, yet regularly disrupted by buyer changes, style variation and attendance volatility. This supports the quantitative finding that manpower forecasting is strongly associated with productivity.

Forecasting decisions were described as technically grounded, but sensitive to operational instability. The Production Manager (P2, Dhaka) noted that planning is done “against the order volume and daily target,” but added, “when the buyer changes the plan, we have to revise manpower the same day” (P2, Production Manager, Dhaka). The IE Officer (P3, Dhaka) explained that allocation is “SMV-based,” yet “a style change or bottleneck can make the plan unrealistic for the line” (P3, IE Officer, Dhaka).

A second issue was that the effective manpower plan is often confirmed only after attendance is known. The Line Chief (P5, Dhaka) stated, “Morning attendance decides the real manpower. If people are absent, we shift operators and arrange overtime to protect output” (P5, Line Chief, Dhaka). The HR Officer (P1, Dhaka) similarly linked planning reliability to workforce records, noting that “attendance and turnover tracking helps planning, but sudden absence creates gaps that are hard to predict” (P1, HR Officer, Dhaka). In Gazipur, the IE/Planning Executive (P8) described continuous revisions when “order quantity or style changes,” requiring the team to “rebalance lines quickly to avoid shipment delay” (P8, IE/Planning Executive, Gazipur). Overall, forecasting supports productivity by aligning labour with targets, but its effectiveness depends on how well factories can manage volatility through rapid adjustment.

THEME 2: RECRUITMENT SPEED VERSUS SKILL FIT CREATES PRODUCTIVITY LEAKAGE

Participants consistently described recruitment and selection as shaped by urgent production pressure, where filling vacancies quickly often outweighs careful skill matching. While basic screening exists, rapid hiring can lead to skill mismatch, slower line efficiency, higher errors and increased rework. This theme helps explain why recruitment and selection is statistically

significant in regression, yet shows a weaker bivariate correlation with productivity, its influence is often indirect through learning time, turnover and line stability.

From HR, P1 noted that “most recruitment happens through referrals and local contacts,” and factories prioritise “quick joining because the line cannot stay empty” (P1, HR Officer, Dhaka). Similarly, P6 explained, “we can do basic screening, but when there is shortage, we cannot wait long for the perfect worker” (P6, HR/Admin Executive, Gazipur).

Participants repeatedly linked mismatch to output and quality problems. The Production Manager (P2, Dhaka) stated, “if the operator is not suitable for the operation, the line target suffers and quality problems increase” (P2, Production Manager, Dhaka). The IE/Planning Executive (P8, Gazipur) added that new hires may destabilise line planning because “their speed and skill level does not match the SMV plan, so the line balance becomes unstable” (P8, IE/Planning Executive, Gazipur). At execution level, the Line Chief (P5, Dhaka) noted, “we need time to see who can do which operation. Until then, output is slower and mistakes are higher” (P5, Line Chief, Dhaka).

Participants also highlighted that turnover reopens vacancies and repeatedly disrupts stability. As P6 stated, “turnover is high when workers move for small wage differences or leave after pressure periods” (P6, HR/Admin Executive, Gazipur). Overall, recruitment supports productivity most when it achieves skill fit and retention, but fast hiring can generate hidden losses through learning time, mismatch and rework.

THEME 3: TRAINING WORKS WHEN IT IS STRUCTURED, SHORT, AND LINKED TO LINE NEEDS

Interview findings suggest that training improves productivity when it is practical, targeted and directly connected to line requirements. Participants distinguished between general training and training that reduces learning time, prevents defects and improves flexibility for line balancing. This adds depth to the quantitative finding that training and skill development has the strongest association with productivity.

The Training/Compliance Officer (P4, Dhaka) stated that training must be “linked to the actual operation and SOP,” explaining that “if training is practical, the operator learns faster and we see fewer quality mistakes” (P4, Training/Compliance Officer, Dhaka). The Production Manager (P2, Dhaka) similarly noted, “when operators are trained for the right operation, target achievement becomes easier and the line runs more stable” (P2, Production Manager, Dhaka).

Participants also emphasised onboarding and short orientation for new joiners. P6 explained, “new joiners need quick orientation, otherwise supervisors spend time correcting and production slows” (P6, HR/Admin Executive, Gazipur). P7 reinforced this, stating, “when new workers don’t understand the operation, stoppages increase. Short training on the exact process saves time later” (P7, Senior Supervisor, Gazipur).

Cross-training was described as a key buffer under absenteeism and style changes. The IE Officer (P3, Dhaka) noted that “if workers can do two or three key operations, we can balance the line faster when style changes” (P3, IE Officer, Dhaka). The Line Chief (P5, Dhaka) added, “if someone is absent, we can shift a cross-trained person and keep the line running” (P5, Line Chief, Dhaka). Overall, training supports productivity through faster learning, fewer defects and improved flexibility.

THEME 4: SCHEDULING AND ALLOCATION IS A HIDDEN TRADE-OFF LEVER

Participants described work scheduling and allocation as a powerful short-term tool for protecting shipment deadlines, mainly through overtime and rapid redeployment. At the same time, they highlighted hidden costs such as disrupted line rhythm, fatigue, bottlenecks and quality decline. This theme helps explain your quantitative pattern where scheduling correlates positively with productivity but becomes negative in the regression model when controlling for the other SWP dimensions.

The Line Chief (P5, Dhaka) described day-to-day scheduling as reactive, stating, “if many are absent or the target is not meeting, we extend overtime and move people from one line to another to save the day” (P5, Line Chief, Dhaka). The Senior Supervisor (P7, Gazipur) added, “we adjust work distribution quickly, sometimes two or three times in a day” (P7, Senior Supervisor, Gazipur).

From the IE perspective, frequent reallocations were seen as efficiency-reducing. The IE Officer (P3, Dhaka) noted that “line balance depends on stability, but urgent reallocations break the balance and create bottlenecks” (P3, IE Officer, Dhaka). P8 similarly stated that too much shifting reduces efficiency because “the operator’s speed doesn’t match the new operation” (P8, IE/Planning Executive, Gazipur).

Participants also linked overtime reliance to errors and rework. P4 observed, “after long overtime, mistakes increase and quality control becomes harder, so rework goes up” (P4, Training/Compliance Officer, Dhaka). The Production Manager (P2, Dhaka) summarised the

trade-off: “overtime helps us meet shipment, but if we rely on it too much, efficiency and quality suffer in the next days” (P2, Production Manager, Dhaka). Overall, scheduling supports output under pressure, but heavy reliance on overtime and frequent reallocation can undermine stability and quality, aligning with the negative direction observed in the controlled regression model.

TABLE 4.9 THEMATIC ANALYSIS SUMMARY

Theme	Brief meaning (what respondents described)	Typical indicators / codes	Key respondents (examples)	Link to quantitative results
Theme 1: Forecasting is mostly reactive, not strategic	Forecasting is essential but short-term, revised frequently due to buyer changes, style variation, and attendance volatility.	Order volume and daily targets, SMV-based planning, buyer plan change, style change, absenteeism, rapid revision, rebalancing lines	P2 (Production), P3 (IE), P5 (Line Chief), P1 (HR), P8 (IE/Planning)	Explains the strong positive relationship between manpower forecasting and productivity by showing forecasting improves output when it aligns labour to targets, but must be constantly adjusted.
Theme 2: Recruitment speed vs skill fit creates productivity leakage	Factories prioritise quick hiring to avoid empty lines, but rapid recruitment often leads to skill mismatch, learning time, and rework.	Referral-based hiring, labour shortage, basic screening, mismatch to operation/style, slower output, quality defects, rework, turnover cycle	P1 (HR), P6 (HR/Admin), P2 (Production), P8 (IE/Planning), P5 (Line Chief)	Helps explain why recruitment and selection is significant in regression but shows a weaker bivariate link, its effect is often indirect through mismatch and turnover.
Theme 3: Training works when it is structured, short, and line-linked	Training supports productivity when it is practical, operation-focused, and linked to line needs (onboarding, SOP/quality, cross-skilling).	Practical training, SOP-based learning, faster onboarding, fewer stoppages, reduced defects, cross-training, flexibility for balancing	P4 (Training/Compliance), P2 (Production), P6 (HR/Admin), P7 (Supervisor), P3 (IE), P5 (Line Chief)	Supports the finding that training and skill development shows the strongest association with productivity by explaining the mechanisms (faster learning, fewer defects, flexibility).
Theme 4: Scheduling and allocation is a hidden trade-off lever	Overtime and rapid redeployment protect shipments, but frequent shifting and long hours disrupt stability and raise fatigue-related errors and rework.	Overtime reliance, frequent reallocation, broken line balance, bottlenecks, speed mismatch in new operation, fatigue, quality decline, rework	P5 (Line Chief), P7 (Supervisor), P3 (IE), P8 (IE/Planning), P4 (Training/Compliance), P2 (Production)	Explains why scheduling correlates positively with productivity but becomes negative in the regression model , it often acts as a coping strategy under instability and can reduce quality and stability when overused.

4.4 INTEGRATION AND TRIANGULATION

This study used integration and triangulation to strengthen the credibility of the findings by comparing quantitative results with qualitative interview evidence. The quantitative phase identified statistically significant relationships between strategic workforce planning dimensions and productivity, while the qualitative phase provided contextual explanations of how these practices operate in factory settings. Overall, the two strands were broadly consistent. For example, the strong positive associations of manpower forecasting and training with productivity were supported by interview accounts highlighting how target-based planning and structured, line-linked training reduce stoppages, defects, and learning time. Recruitment and selection was also described as influential, but often indirectly, through skill–job fit and turnover-related disruption. In addition, interview evidence helped clarify the scheduling and allocation result by showing that overtime and frequent redeployment can protect shipment deadlines, yet may create fatigue, instability, and quality rework when overused. These integrated insights are summarised in Table 4.9 and provide a foundation for the deeper interpretation in Chapter 5.

4.5 CHAPTER SUMMARY

Overall, the quantitative results show that respondents reported generally positive perceptions of strategic workforce planning practices and productivity. Reliability testing indicated acceptable internal consistency for most constructs, supporting the use of composite mean scores. Correlation analysis found statistically significant positive associations between each workforce planning dimension and productivity, with particularly strong relationships for training and skill development and manpower forecasting. The multiple regression model demonstrated high explanatory power, indicating that the workforce planning variables jointly account for a substantial proportion of variance in perceived productivity within the sampled factories. A notable pattern is that work scheduling and allocation, while positively correlated with productivity, displayed an inverse coefficient in the regression model when other predictors were controlled, highlighting a complex relationship that requires careful interpretation. Qualitative themes reinforced the importance of forecasting and structured, line-linked training, while also showing how rapid recruitment, overtime dependence, and frequent redeployment shape day-to-day productivity outcomes.

CHAPTER 5: DISCUSSION

5.1 CHAPTER OVERVIEW

This chapter discusses the findings presented in Chapter 4 in relation to the research aims, research questions, and the theoretical and empirical literature reviewed in Chapter 2. The purpose is to interpret what the results mean for strategic workforce planning (SWP) and productivity optimisation in apparel factories located in Dhaka and Gazipur, Bangladesh. The chapter first examines how SWP currently operates in practice and assesses whether it functions as a strategic, forward-looking system or as a reactive, short-cycle coordination mechanism. It then interprets the quantitative hypothesis results by explaining how each SWP dimension influences productivity, supported by interview evidence that clarifies underlying mechanisms and operational trade-offs. Finally, the chapter discusses the key barriers that constrain SWP effectiveness, including buyer-driven volatility, labour supply instability, and skill-development challenges. The discussion concludes by highlighting the study's theoretical and managerial implications for improving workforce planning and sustaining productivity performance.

5.2 DISCUSSION OF FINDINGS BY RESEARCH QUESTIONS

5.2.1 CURRENT SWP PRACTICES AND HOW THEY OPERATE IN FACTORIES (DHAKA AND GAZIPUR)

The evidence indicates that strategic workforce planning (SWP) in the sampled apparel factories is present, but it is largely operational and reactive rather than long-horizon and strategic. This aligns with prior research suggesting that HR systems in many Bangladeshi garment factories remain fragmented and compliance-oriented, with limited emphasis on integrated planning and structured skill pipelines (Rashid et al., 2019).

Both datasets point to the same operating pattern. Quantitatively, respondents reported that forecasting, recruitment, training, and scheduling practices exist and are associated with productivity outcomes. Qualitatively, however, managers and technical staff described these practices as “adjustment-driven,” frequently revised in response to buyer changes, style variation, and attendance volatility. This operational instability reflects the wider sector context where factories face non-productive time and last-minute adjustments linked to planning weaknesses and deadline pressure (Habib, 2023; Bangladesh Bank, 2024).

The interviews also show that SWP is implemented through a mix of HR and production planning routines. Forecasting was often built from order volume, SMV, and capacity targets, and then updated after daily attendance became clear. Scheduling and allocation were used as immediate control levers through overtime and redeployment to protect shipment commitments. This practice is consistent with evidence that factories frequently rely on overtime and rescheduling to cope with demand fluctuations, which may secure short-term output but can erode longer-term productivity and worker outcomes.

Overall, the findings suggest that current SWP “operates” mainly as short-cycle coordination between HR and production, rather than as a stable, forward-planning system. This is an important empirical insight because it helps explain why some SWP dimensions show strong productivity links, while others appear as coping mechanisms under volatility.

5.2.2 HOW SWP DIMENSIONS INFLUENCE PRODUCTIVITY (HYPOTHESES INTERPRETATION)

The quantitative results provide strong evidence that SWP dimensions are associated with productivity optimisation, and the qualitative findings explain the mechanisms and trade-offs behind these relationships. In correlation analysis, all SWP variables showed statistically significant positive associations with productivity. The strongest relationships were for training and skill development and manpower forecasting, while recruitment and work scheduling showed weaker but still significant correlations. The regression model further indicates that, taken together, the four SWP dimensions explain a substantial proportion of variance in productivity ($R^2 = .886$), suggesting that SWP works as a system rather than as isolated practices.

MANPOWER FORECASTING

Manpower forecasting had a significant positive effect on productivity in the regression model ($\beta = .512$, $p < .001$). The qualitative data clarifies why forecasting matters in apparel production. Participants linked forecasting to aligning labour with order volume and daily targets, using technical planning logic (SMV, line targets) to reduce bottlenecks and protect flow. This aligns with prior evidence that poor planning and frequent adjustments contribute to non-productive time and bottlenecks, while improved planning approaches can increase efficiency (Habib, 2023; Rahman et al., 2024). Hence, hypothesis 1 (Manpower forecasting positively influences productivity) is accepted.

RECRUITMENT AND SELECTION

Recruitment and selection had a significant positive effect on productivity ($\beta = .453, p < .001$). However, interviews show the effect is often indirect. Factories prioritise speed of hiring under labour shortages, which can reduce skill fit and create learning-time losses, quality errors, and rework. This helps explain why the bivariate correlation is relatively weak, yet recruitment remains significant when the broader SWP system is considered. The finding is consistent with evidence that recruitment and selection practices in Bangladesh RMG factories contribute to employee productivity, although HR systems can remain uneven and reactive across factories (Ali and Barishal, 2022; Rashid et al., 2019). Hence, hypothesis 2 (Recruitment and selection positively influences productivity) is accepted.

TRAINING AND SKILL DEVELOPMENT

Training and skill development produced the strongest positive effect on productivity ($\beta = .518, p < .001$). Interview evidence indicates that training improves productivity when it is short, structured, and linked to real line needs, particularly onboarding, SOP-based learning, and cross-training to handle absenteeism and style changes. This is strongly supported by both international and Bangladesh-focused literature on high-performance work practices and targeted capability development. HPWP research links extensive training and complementary HR bundles with higher labour productivity and stronger performance outcomes (Huselid, 1995; Sheehan and Garavan, 2022). Sector-specific evidence also supports the productivity value of structured training and progression, for example Better Work's GEAR programme, which reports measurable productivity gains from training and promoting operators into supervisory roles (Better Work, 2023). Hence, hypothesis 3 (Training and skill development positively influences productivity) is accepted.

WORK SCHEDULING AND ALLOCATION

While work scheduling and allocation correlated positively with productivity, it showed a statistically significant negative effect in the regression model ($\beta = -.542, p < .001$). The qualitative findings explain this “trade-off” pattern. Scheduling and allocation practices were frequently described as reactive coping strategies, relying on overtime and rapid redeployment to meet shipment targets. These actions can protect short-term output, but they also disrupt line stability, raise fatigue, and increase errors and rework, which undermines sustainable productivity. This interpretation is consistent with the broader literature linking excessive overtime and difficult working conditions to reduced work ability, fatigue, absenteeism risk,

and performance constraints (Zohra et al., 2025). Hence, hypothesis 4 (Work scheduling and allocation positively influences productivity) is rejected.

Taken together, the findings suggest that forecasting and training represent capability-building drivers of productivity, recruitment supports productivity when it improves skill fit and retention, and scheduling functions as a short-term stabiliser that can become counterproductive when used as a substitute for upstream planning and skills investment. This integrated insight contributes to the study’s theoretical framing by showing how “ability” and “opportunity” elements in workforce systems can generate productivity, while volatility management through overtime can create diminishing returns.

TABLE 5.1: HYPOTHESES ACCEPTANCE OR REJECTION

Hypothesis	Statement	Statistical Evidence (Regression)	Decision
H1	Manpower forecasting positively influences productivity optimisation.	$\beta = .512, p < .001$	Accepted
H2	Recruitment and selection positively influences productivity optimisation.	$\beta = .453, p < .001$	Accepted
H3	Training and skill development positively influences productivity optimisation.	$\beta = .518, p < .001$	Accepted
H4	Work scheduling and allocation positively influences productivity optimisation.	$\beta = -.542, p < .001$	Rejected (negative significant effect)

5.2.3 BARRIERS AND CONSTRAINTS THAT SHAPE SWP EFFECTIVENESS

The results indicate that SWP effectiveness is constrained by a combination of external volatility and internal workforce frictions, which collectively push factories toward reactive decision-making. A central constraint is buyer-driven instability, including plan changes, style variation, and tight lead-time pressure. Interview participants repeatedly described manpower plans as technically grounded but frequently invalidated by sudden buyer changes and operational bottlenecks. This fits the sector evidence that poor planning, frequent style changes, and weak follow-up contribute to non-productive time, bottlenecks, and late shipments, with downstream commercial consequences (Habib, 2023; Rahman et al., 2024).

A second constraint is labour supply instability through absenteeism and turnover. The qualitative data shows that attendance uncertainty often determines the “real” manpower plan each morning, forcing rapid redeployment and overtime. This aligns with prior research identifying low wages, excessive overtime, limited career prospects, and working conditions as key drivers of turnover, which disrupts production stability and raises replacement and training costs (Hossain and Mahmood, 2018).

A third barrier relates to skill gaps and the difficulty of sustaining capability development under pressure. While training was found to be a strong productivity driver, interviews suggest that training effectiveness depends on structure and line linkage, which is harder to maintain when factories are continuously firefighting. This reflects earlier evidence of skill gaps in key management roles and the need for systematic workforce planning to ensure the right competencies are in place (Newaz et al., 2023).

Overall, these constraints help explain why scheduling becomes a high-use coping lever, and why the most productivity-enhancing SWP practices are those that reduce volatility exposure by building skills, improving fit, and strengthening planning discipline rather than relying on overtime as the primary adjustment tool.

5.3 IMPLICATIONS OF THE STUDY

The findings provide clear implications for both theory and managerial practice in Bangladesh's apparel manufacturing context. The results support the view that strategic workforce planning functions as an integrated productivity system, consistent with Human Capital Theory and the Resource-Based View, which emphasise workforce capability and organisation-specific routines as sources of performance advantage. In particular, the strong positive effects of manpower forecasting and training indicate that productivity optimisation is most effectively achieved through forward-aligned labour planning and structured capability development, rather than through short-term operational improvisation.

From a practical perspective, the evidence suggests that factories should prioritise strengthening forecasting discipline, linking manpower plans to order volume, SMV-based capacity, and attendance trend data, while improving follow-up routines to reduce bottlenecks and non-productive time. Training should be treated as a direct productivity lever, with investment directed toward short, operation-specific onboarding, SOP-based quality training, and cross-training to increase line flexibility under style changes and absenteeism. Recruitment and selection should be improved beyond speed-focused hiring by applying basic skill-fit screening and retention-focused onboarding, as mismatch and turnover generate hidden productivity leakage through learning time, errors, and rework.

Crucially, the rejection of the scheduling hypothesis indicates that heavy reliance on overtime and frequent redeployment may protect short-term shipment commitments but can undermine sustainable productivity through fatigue, instability, and quality loss. Therefore, scheduling

should be repositioned as a controlled support tool, not a substitute for upstream planning and skill development.

5.4 CHAPTER SUMMARY

Chapter 5 interpreted the empirical results using the literature and theoretical framework developed in Chapter 2. The findings indicate that SWP is present in the sampled factories but is primarily operational and reactive, shaped by buyer plan changes, style variation, and attendance uncertainty. Quantitative results demonstrate that manpower forecasting, recruitment and selection, and training and skill development have significant positive effects on productivity optimisation, and qualitative evidence explained how these practices improve output stability, reduce learning time, and strengthen line flexibility. In contrast, work scheduling and allocation, while positively correlated with productivity, showed a negative effect in the regression model, suggesting that heavy reliance on overtime and frequent redeployment may undermine sustainable productivity through instability, fatigue, and quality-related rework. Overall, the chapter concludes that productivity is best supported by capability-building SWP practices, particularly forecasting discipline and line-linked training, while reactive scheduling should be managed as a limited support tool rather than a primary productivity strategy.

CHAPTER 6: RECOMMENDATIONS AND CONCLUSION

6.1 CHAPTER OVERVIEW

This chapter closes the dissertation by consolidating the main findings from the quantitative survey (N = 139) and the qualitative interviews on strategic workforce planning (SWP) and productivity optimisation in apparel factories in Dhaka and Gazipur. It provides practical recommendations grounded in the strongest statistical relationships and the mechanisms explained by participants. It then concludes by linking the overall findings back to the aim, objectives, and research questions. The chapter ends with key limitations and priority directions for future research.

6.2 RECOMMENDATION

The combined evidence indicates that productivity optimisation is strongest when SWP is forward-looking, skill-focused, and integrated with production planning. Overall, the quantitative results show that manpower forecasting, recruitment and selection, and training and skill development are positively associated with productivity. In the multivariable model, work scheduling and allocation shows a weaker and more conditional pattern, suggesting that scheduling decisions may interact with other SWP elements and the operational pressures described in the interviews. The recommendations below are structured around these results and the barriers identified in the interview themes, including buyer-driven volatility, labour supply instability, and “firefighting” routines.

1) Prioritise short, job-linked training as the main productivity lever

Training and skill development showed the strongest positive effect on productivity. Factories should therefore introduce (a) standard onboarding for new hires, (b) weekly modular skill sessions aligned to critical sewing operations, and (c) cross-training for bottleneck operations to protect output during absenteeism and style changeovers. This fits Human Capital Theory and high-performance work practice evidence that training investments raise capability and labour productivity (Becker, 1964; Huselid, 1995; Sheehan and Garavan, 2022). It also matches Bangladesh evidence that targeted supervisory training can improve line efficiency and reduce quality costs (Better Work, 2025).

2) Build forecasting routines linked to SMV, capacity, and line balancing

Manpower forecasting had a strong positive effect. Managers should use a rolling 4–6-week labour plan tied to order volume, SMV, and capacity targets, then update weekly using

attendance trends. This responds to evidence that weak planning creates bottlenecks and non-productive time, while better planning improves efficiency and lead time (Habib, 2023; Rahman et al., 2024).

3) Strengthen selection quality without slowing hiring

Recruitment and selection significantly related to productivity. Factories should add quick skill screening, structured promotion criteria for line chiefs, and a women supervisor pipeline aligned with Better Work GEAR, because deliberate selection and development improves productivity and inclusion (Rashid et al., 2019; Better Work, 2025). These measures can be designed to be fast and practical, reducing the risk that quality controls slow down urgent hiring.

4) Reduce “firefighting” scheduling and control overtime

Scheduling decisions can protect short-term delivery under buyer pressure, but the interviews indicate that heavy reliance on overtime and frequent redeployment can undermine consistency, increase fatigue, and create quality risks over time. Rather than treating overtime and redeployment as the default response to volatility, factories should set reasonable overtime caps, rotate overtime fairly, and use skills matrices to allocate workers with less disruption. In addition, basic line balancing routines and clearer daily production communication can reduce last-minute movement of operators and stabilise performance.

6.3 CONCLUSION

This study set out to evaluate how strategic workforce planning (SWP) practices are associated with productivity optimisation in apparel factories in Dhaka and Gazipur. It focused on four core SWP dimensions, manpower forecasting, recruitment and selection, training and skill development, and work scheduling and allocation, and assessed their relationship with perceived productivity outcomes, alongside the practical constraints that shape implementation. The study used a quantitative worker survey and a qualitative interview phase with eight managers and technical staff to strengthen credibility through triangulation.

Overall, the findings show that the study achieved its aim and met all four research objectives. First, it documented the SWP practices currently used in the selected factories and showed that planning is often applied, but frequently reactive and short horizon, especially under buyer changes and attendance volatility. Second, the quantitative results confirmed meaningful relationships between SWP and productivity. Correlation analysis showed statistically

significant positive associations between the SWP dimensions and productivity ($N = 139$). The multiple regression model was statistically significant and explained a large share of variance in productivity ($R^2 = .886$), indicating that SWP practices jointly relate to productivity in this context. Third, the study identified key operational and organisational challenges that complicate implementation, including overtime dependence, rapid redeployment, recruitment pressures, and uneven skills development, which can stabilise output in the short term but weaken performance sustainability.

These results answer the main research question and support the practical value of a structured SWP approach for productivity optimisation. The evidence is consistent with wider research arguing that coordinated HR practice bundles, particularly staffing and training, support stronger productivity outcomes (Huselid, 1995; Sheehan and Garavan, 2022). In addition, the Bangladesh RMG evidence base suggests targeted skills development can generate measurable productivity gains, which aligns with this study's strongest effects for training and forecasting.

6.4 LIMITATIONS AND FUTURE RESEARCH

This study has several limitations that should be considered when interpreting the findings and applying them beyond the sampled context. First, the quantitative analysis was based on a sample of 139 survey responses, supported by eight semi-structured interviews. While the sample was sufficient to test the proposed relationships and generate clear patterns, it does not allow strong generalisation to the wider Bangladeshi apparel industry. Second, the study focused only on factories located in Dhaka and Gazipur. These are major production hubs, but workforce conditions, compliance pressures, and labour market dynamics may differ in other regions, which may influence how SWP relates to productivity. Third, most measures relied on self-reported perceptions using Likert-scale items, particularly for productivity optimisation. This approach captures workplace realities and managerial experiences, but it may not reflect objective productivity performance in the same way as operational metrics such as line efficiency, defect rates, rework levels, absenteeism, or overtime dependency. In addition, the cross-sectional design captures relationships at one point in time, so it cannot confirm causality or show how SWP improvements translate into productivity gains over time. Finally, some SWP dimensions may overlap in practice, and future studies should apply additional diagnostics and alternative modelling approaches to separate closely related factors more clearly.

Future research should address these limitations by using larger samples across different regions and factory types, and by incorporating objective operational data alongside employee perceptions. Longitudinal designs would be especially useful to examine how changes in forecasting, recruitment, training, and scheduling practices affect productivity across multiple production cycles. Researchers could also test mediating and moderating effects, such as whether training improves productivity through reduced defects, or whether order volatility and buyer pressure weakens the benefits of workforce planning.

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APPENDIX A

QUOTATIVE SURVEY QUESTIONER

08/01/2026, 09:39

STRATEGIC WORKFORCE PLANNING AND PRODUCTIVITY OPTIMIZATION IN APPAREL FACTORIES: EVIDENCE FRO...

STRATEGIC WORKFORCE PLANNING AND PRODUCTIVITY OPTIMIZATION IN APPAREL FACTORIES: EVIDENCE FROM DHAKA AND GAZIPUR, BANGLADESH

Dear Sir/Madam,

My name is **Nadimul Hasan**, and I am a postgraduate student at the **University of Wales Trinity Saint David (London Campus)**. I am conducting a research project titled "*Strategic Workforce Planning and Productivity Optimization in Apparel Factories: Evidence from Dhaka and Gazipur, Bangladesh.*"

The purpose of this study is to explore how effective strategic workforce planning (SWP)—through forecasting, recruitment, skill development, and scheduling—can help apparel factories improve productivity and operational efficiency. The research aims to uncover how better planning and management of human resources can reduce absenteeism, boost output, and strengthen competitiveness in Bangladesh's garment industry. By combining employee surveys with managerial insights, this study seeks to offer a balanced view of both the practical challenges and measurable benefits of structured workforce planning.

I would like to invite you to participate in this study by completing a questionnaire and/or a short interview regarding your experience with workforce planning and productivity in your organisation.

With your consent, I may take brief notes or audio recordings during the discussion to ensure accuracy. The activity will take around 15–20 minutes. Participation is entirely voluntary, and you may withdraw at any point without giving a reason. You will not receive any payment or benefit for participating.

All responses will remain confidential and used solely for academic purposes in accordance with the University's Research and Data Management Policy. No personal identifiers will appear in the final report.

NADIMUL HASAN
Email: mdnadimul99@gmail.com

* Indicates required question

PARTICIPATION CONSENT FORM

Project Title: STRATEGIC WORKFORCE PLANNING AND PRODUCTIVITY OPTIMIZATION IN APPAREL FACTORIES: EVIDENCE FROM DHAKA AND GAZIPUR, BANGLADESH

Aim of Research: The study aims to evaluate how Strategic Workforce Planning (SWP) practices influence productivity performance in apparel factories of Bangladesh

1. Please read the statements below and confirm if you agree: *

1. I confirm that I have read and understood the information sheet for the above study.
2. I understand there are no material benefits for participating.
3. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason.
4. I understand that any information given by me may be used in future reports, articles or presentations by the researcher.
5. Where applicable, I understand that my details will be anonymous.
6. I agree to take part in the above study.

Mark only one oval.

- ☐ Yes, I have read this information and I agree to take part
- ☐ No, I do not want to take part

SECTION A: DEMOGRAPHIC INFORMATION

This section intends to capture your demographic profile. Please tick ('✓') your answer in the appropriate box. Your response will remain anonymous.

2. A1. Factory name *

(This will only be used by the researcher and will not appear in the report.)

3. **A2. Factory location ***

Mark only one oval.

- ☐ Dhaka
- ☐ Gazipur

4. **A3. Gender ***

Mark only one oval.

- ☐ Male
- ☐ Female
- ☐ Prefer not to say

5. **A4. Age group ***

Mark only one oval.

- ☐ 18–24
- ☐ 25–29
- ☐ 30–34
- ☐ 35–39
- ☐ 40 and above

6. **A5. Current position ***

Mark only one oval.

- ☐ Sewing operator
- ☐ Helper
- ☐ Quality inspector
- ☐ Line chief / Line in-charge
- ☐ Supervisor / Junior supervisor
- ☐ Other: _____

7. **A6. Department / Section ****Mark only one oval.*

- ☐ Cutting
- ☐ Sewing
- ☐ Finishing / Packing
- ☐ Quality
- ☐ Other: _____

8. **A7. Employment type ****Mark only one oval.*

- ☐ Permanent
- ☐ Probation / Contract
- ☐ Casual / Temporary

9. **A8. Total years working in the RMG sector ****Mark only one oval.*

- ☐ Less than 1 year
- ☐ 1–3 years
- ☐ 4–6 years
- ☐ 7–10 years
- ☐ More than 10 years

10. **A9. Years working in this factory***Mark only one oval.*

- ☐ Less than 1 year
- ☐ 1–3 years
- ☐ 4–6 years
- ☐ More than 6 years

11. **A10. Highest education level completed ***

Mark only one oval.

- ☐ No formal schooling
- ☐ Primary
- ☐ Secondary (class 6–10)
- ☐ SSC / Equivalent
- ☐ HSC / Equivalent
- ☐ Diploma / Graduate or above
- ☐ Other

SECTION B: QUESTIONS ABOUT WORKFORCE PLANNING PRACTICES

This part of the survey asks about how work is planned and managed in your factory. The questions cover four areas:

- **Manpower Forecasting (MF):** How the factory plans the number of workers needed on lines
- **Recruitment and Selection (RS):** How workers are hired, placed and promoted
- **Training and Skill Development (TSD):** The training and coaching workers and supervisors receive
- **Work Scheduling and Allocation (WSA):** How daily working hours, overtime and tasks on the line are organised

For each statement, please tick one answer to show how much you agree or disagree, based on your own experience.

Scale:

1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

12. **MF1. Management plans the number of workers needed on my line in advance.** *

Mark only one oval.

- 1 2 3 4 5
- Strongly Disagree ☐ ☐ ☐ ☐ ☐ Strongly Agree

13. **MF2.** Changes in buyer orders are reflected in updated staffing plans. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

14. **MF3.** The number of workers on my line usually matches the workload. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

15. **MF4.** We rarely face sudden worker shortages that disrupt production. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

16. **MF5.** Extra workers or helpers are arranged in advance for complex or new styles. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

17. **RS1.** New workers hired for my section usually have the basic skills needed for ^{*} the job.

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

18. **RS2.** Vacant positions on my line are filled within a reasonable time. ^{*}

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

19. **RS3.** Workers are placed on operations that fit their skills and experience. ^{*}

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

20. **RS4.** Promotion decisions (for example to quality or supervisor) are based ^{*} mainly on ability and performance.

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

21. **RS5.** Management tries to keep good workers instead of frequently replacing them. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

22. **TSD1.** When I joined this factory or line, I received enough initial training to do my job properly. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

23. **TSD2.** I receive training or coaching when new styles or operations are introduced. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

24. **TSD3.** I am encouraged to learn different operations on the line. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

25. **TSD4.** My supervisor or line chief gives feedback that helps me improve my work. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

26. **TSD5.** My supervisors and line chiefs seem properly trained in managing people and solving production problems. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

27. **WSA1.** My daily working hours and breaks are usually predictable. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

28. **WSA2.** Overtime is usually planned and communicated in advance. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

29. **WSA3.** Workload is shared fairly among workers on my line. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

30. **WSA4.** When a worker is absent, a replacement is arranged so that work can continue smoothly. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

31. **WSA5.** The way machines and tables are arranged on my line means we do not need to move around or wait a lot. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

SECTION C: QUESTIONS ABOUT PRODUCTIVITY

This section asks about productivity and performance on your line. For each statement, please tick one answer to show how much you agree or disagree, based on your own experience.

Scale:

1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

32. **PO1.** My line usually meets its daily production targets. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

33. **PO2.** We rarely lose working time because of material or machine problems. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

34. **PO3.** We rarely lose working time because we are waiting for workers or replacements when someone is absent. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

35. **PO4.** The quality of our output is high, with few defects or rework. *

Mark only one oval.

1 2 3 4 5

Stro ☐ ☐ ☐ ☐ ☐ Strongly Agree

36. **PO5.** Overall, people and time are used efficiently on my line. *

Mark only one oval.

	1	2	3	4	5	
Stro	☐	☐	☐	☐	☐	Strongly Agree

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Google Forms

APPENDIX B

INTERVIEW GUIDE

TITLE OF THE STUDY: STRATEGIC WORKFORCE PLANNING AND PRODUCTIVITY OPTIMIZATION IN APPAREL FACTORIES: EVIDENCE FROM DHAKA AND GAZIPUR, BANGLADESH

Interview length: 15–25 minutes

Participant role: _____ **Factory code:** _____ **Date:** _____

Consent to record (Yes/No): _____

Thank you for your time. This interview is for academic research on workforce planning and productivity. Your responses will be confidential and anonymous. There are no right or wrong answers. With your permission, I would like to record for accuracy.

A) Background

- What is your role and main responsibilities?
- How long have you worked in this factory / in the apparel sector?
- Factory context (optional): product type (knit/woven/sweater) and number of lines:

B) Main Questions Strategic Workforce Planning

- Walk me through how you forecast manpower needs for the next week or month. What data do you rely on?
- How do you recruit and select workers, and how do you check whether a worker is suitable for a specific operation or line?
- What training is provided for operators/helpers/line leaders, and how is training linked to line needs or production targets?
- When there is absenteeism, urgent shipment pressure, or style changes, how do you adjust scheduling and worker allocation?
- On a normal production day, what are the main reasons productivity goes up or down in your factory?
- Among forecasting, recruitment, training, and scheduling, which practice has the biggest impact on productivity in your factory, and why?

APPENDIX C

SPSS DATA ANALYSIS

```
FREQUENCIES VARIABLES=FactorylocationA2 GenderA3 AgegroupA4 CurrentpositionA5 DepartmentSectionA6
  EmploymenttypeA7 TotalyearsinthefactoryA8 YearsworkinginthisfactoryA9
  HighesteducationlevelcompletedA10
  /ORDER=ANALYSIS.
```

Frequencies

[DataSet8] E:\Nadimul Hasan\Own paper\SPSS DATA FILE_1.sav

Statistics

		Factory location (A2)	Gender (A3)	Age group (A4)	Current position (A5)	Department / Section (A6)
N	Valid	139	139	139	139	139
	Missing	0	0	0	0	0

Statistics

		Employment type (A7)	Total years in the RMG sector (A8)	Years working in this factory (A9)	Highest education level completed (A10)
N	Valid	139	139	139	139
	Missing	0	0	0	0

Frequency Table

Factory location (A2)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Dhaka	97	69.8	69.8	69.8
	Gazipur	42	30.2	30.2	100.0
	Total	139	100.0	100.0	

Gender (A3)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	45	32.4	32.4	32.4
	Male	94	67.6	67.6	100.0
	Total	139	100.0	100.0	

Age group (A4)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18–24	34	24.5	24.5	24.5
	25–29	27	19.4	19.4	43.9
	30–34	30	21.6	21.6	65.5
	35–39	29	20.9	20.9	86.3
	40 and above	19	13.7	13.7	100.0
	Total	139	100.0	100.0	

Current position (A5)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Helper	14	10.1	10.1	10.1
	Line chief / Line in-charge	16	11.5	11.5	21.6
	Other	1	.7	.7	22.3
	Quality inspector	40	28.8	28.8	51.1
	Sewing operator	53	38.1	38.1	89.2
	Supervisor / Junior supervisor	15	10.8	10.8	100.0
	Total	139	100.0	100.0	

Department / Section (A6)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Cutting	42	30.2	30.2	30.2
	Finishing / Packing	28	20.1	20.1	50.4
	Quality	16	11.5	11.5	61.9
	Sewing	53	38.1	38.1	100.0
	Total	139	100.0	100.0	

Employment type (A7)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Casual / Temporary	5	3.6	3.6	3.6
	Permanent	114	82.0	82.0	85.6
	Probation / Contract	20	14.4	14.4	100.0
	Total	139	100.0	100.0	

Total years in the RMG sector (A8)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1–3 years	32	23.0	23.0	23.0
	4–6 years	49	35.3	35.3	58.3
	7–10 years	26	18.7	18.7	77.0
	Less than 1 year	9	6.5	6.5	83.5
	More than 10 years	23	16.5	16.5	100.0
	Total	139	100.0	100.0	

Years working in this factory (A9)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1–3 years	46	33.1	33.1	33.1
	4–6 years	29	20.9	20.9	54.0
	Less than 1 year	21	15.1	15.1	69.1
	More than 6 years	43	30.9	30.9	100.0
	Total	139	100.0	100.0	

Highest education level completed (A10)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Diploma / Graduate or above	20	14.4	14.4	14.4
	HSC / Equivalent	20	14.4	14.4	28.8
	Other	8	5.8	5.8	34.5
	Primary	31	22.3	22.3	56.8
	Secondary (class 6–10)	16	11.5	11.5	68.3
	SSC / Equivalent	44	31.7	31.7	100.0
	Total	139	100.0	100.0	

DESCRIPTIVES VARIABLES=Avg_MF Avg_RS Avg_TDS Avg_WSA Avg_PO
/STATISTICS=MEAN STDDEV MIN MAX.

Descriptives

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Manpower Forecasting	139	1.60	5.00	3.8604	.68426
Recruitment and Selection	139	1.60	5.00	3.8619	.67453
Training and Skill Development	139	2.20	5.00	3.9698	.53887
Work Scheduling and Allocation	139	1.60	5.00	3.8000	.74794
Productivity	139	2.60	5.00	3.9971	.55690
Valid N (listwise)	139				

```
RELIABILITY
/VARIABLES=MF1 MF2 MF3 MF4 MF5
/SCALE('ALL VARIABLES') ALL
/MODEL=ALPHA.
```

Reliability

[DataSet8] E:\Nadimul Hasan\Own paper\SPSS DATA FILE_1.sav

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	139	100.0
	Excluded ^a	0	.0
	Total	139	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.729	5

```
RELIABILITY
/VARIABLES=RS1 RS2 RS3 RS4 RS5
/SCALE('ALL VARIABLES') ALL
/MODEL=ALPHA.
```

Reliability

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	139	100.0
	Excluded ^a	0	.0
	Total	139	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.738	5

```
RELIABILITY
/VARIABLES=TSD1 TSD2 TSD3 TSD4 TSD5
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```

Reliability

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	139	100.0
	Excluded ^a	0	.0
	Total	139	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.641	5

```
RELIABILITY
/VARIABLES=WSA1 WSA2 WSA3 WSA4 WSA5
/SCALE('ALL VARIABLES') ALL
/MODEL=ALPHA.
```

Reliability

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	139	100.0
	Excluded ^a	0	.0
	Total	139	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.774	5

```
RELIABILITY
/VARIABLES=PO1 PO2 PO3 PO4 PO5
/SCALE('ALL VARIABLES') ALL
/MODEL=ALPHA.
```

Reliability

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	139	100.0
	Excluded ^a	0	.0
	Total	139	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
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```
CORRELATIONS
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/PRINT=TWOTAIL NOSIG FULL
/MISSING=PAIRWISE.
```

Correlations

Correlations

		Manpower Forecasting	Recruitment and Selection	Training and Skill Development
Manpower Forecasting	Pearson Correlation	1	.369**	.761**
	Sig. (2-tailed)		.000	.000
	N	139	139	139
Recruitment and Selection	Pearson Correlation	.369**	1	.233**
	Sig. (2-tailed)	.000		.006
	N	139	139	139
Training and Skill Development	Pearson Correlation	.761**	.233**	1
	Sig. (2-tailed)	.000	.006	
	N	139	139	139
Work Scheduling and Allocation	Pearson Correlation	.398**	.969**	.234**
	Sig. (2-tailed)	.000	.000	.005
	N	139	139	139
Productivity	Pearson Correlation	.858**	.238**	.886**
	Sig. (2-tailed)	.000	.005	.000
	N	139	139	139

Correlations

		Work Scheduling and Allocation	Productivity
Manpower Forecasting	Pearson Correlation	.398**	.858**
	Sig. (2-tailed)	.000	.000
	N	139	139
Recruitment and Selection	Pearson Correlation	.969**	.238**
	Sig. (2-tailed)	.000	.005
	N	139	139
Training and Skill Development	Pearson Correlation	.234**	.886**
	Sig. (2-tailed)	.005	.000
	N	139	139
Work Scheduling and Allocation	Pearson Correlation	1	.223**
	Sig. (2-tailed)		.008
	N	139	139
Productivity	Pearson Correlation	.223**	1
	Sig. (2-tailed)	.008	
	N	139	139

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

```

REGRESSION
/MISSING LISTWISE
/STATISTICS COEFF OUTS R ANOVA
/CRITERIA=PIN(.05) POUT(.10)
/NOORIGIN
/DEPENDENT Avg_PO
/METHOD=ENTER Avg_MF Avg_RS Avg_TDS Avg_WSA
/RESIDUALS HISTOGRAM(ZRESID) NORMPROB(ZRESID) .

```

Regression

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	Work Scheduling and Allocation , Training and Skill Development, Manpower Forecasting, Recruitment and Selection ^b	.	Enter

a. Dependent Variable: Productivity

b. All requested variables entered.

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.941 ^a	.886	.882	.19119

a. Predictors: (Constant), Work Scheduling and Allocation , Training and Skill Development, Manpower Forecasting, Recruitment and Selection

b. Dependent Variable: Productivity

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	37.901	4	9.475	259.209	.000 ^b
	Residual	4.898	134	.037		
	Total	42.799	138			

a. Dependent Variable: Productivity

b. Predictors: (Constant), Work Scheduling and Allocation , Training and Skill Development, Manpower Forecasting, Recruitment and Selection

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t
		B	Std. Error	Beta	
1	(Constant)	.351	.143		2.454
	Manpower Forecasting	.417	.040	.512	10.545
	Recruitment and Selection	.374	.098	.453	3.813
	Training and Skill Development	.535	.047	.518	11.326
	Work Scheduling and Allocation	-.403	.090	-.542	-4.481

Coefficients^a

Model	Sig.
1 (Constant)	.015
Manpower Forecasting	.000
Recruitment and Selection	.000
Training and Skill Development	.000
Work Scheduling and Allocation	.000

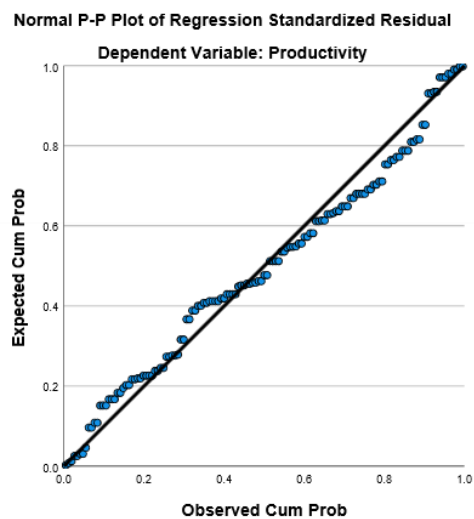
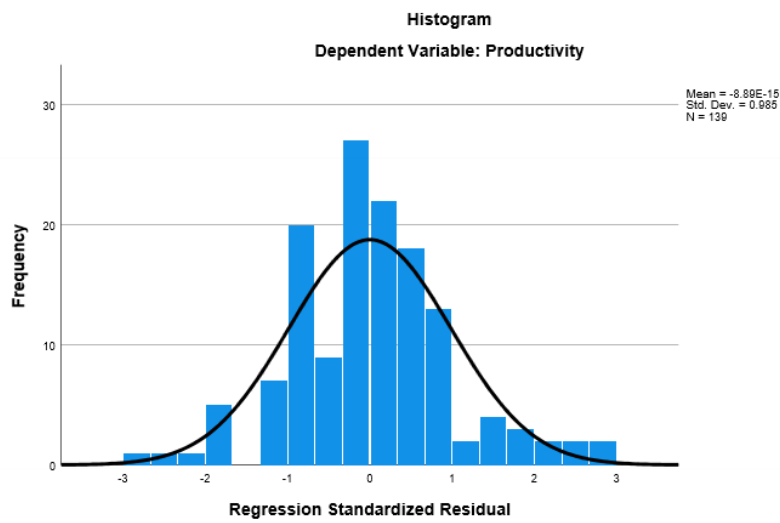
a. Dependent Variable: Productivity

Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2.4361	4.9828	3.9971	.52406	139
Residual	-.54480	.55806	.00000	.18840	139
Std. Predicted Value	-2.979	1.881	.000	1.000	139
Std. Residual	-2.850	2.919	.000	.985	139

a. Dependent Variable: Productivity

Charts



```

FREQUENCIES VARIABLES=FactorylocationA2 GenderA3 AgegroupA4 CurrentpositionA5 Departme
ntSectionA6
      EmploymenttypeA7 TotalyearsinthetRMGsectorA8 YearsworkinginthisfactoryA9
      HighesteducationlevelcompletedA10
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/PIECHART PERCENT
/ORDER=ANALYSIS.

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Frequencies

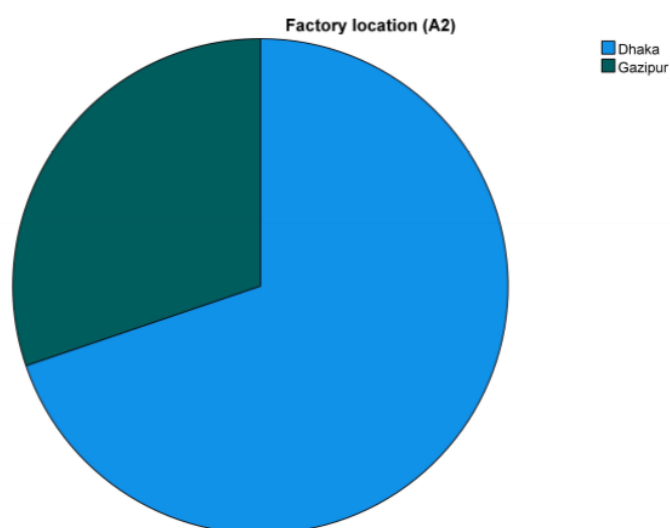
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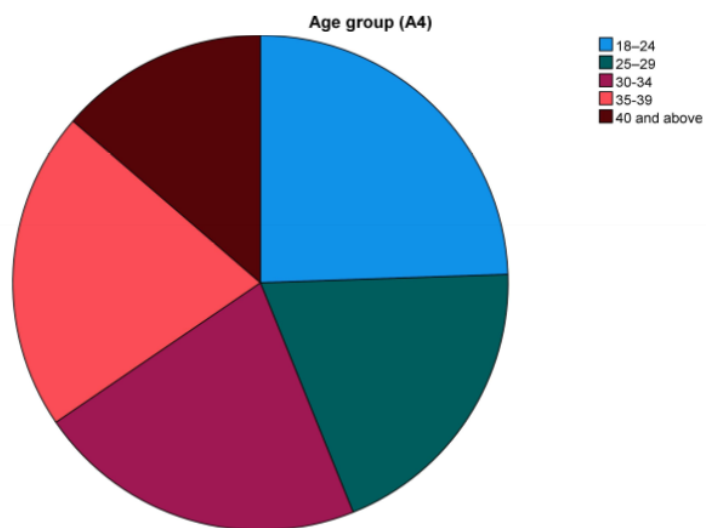
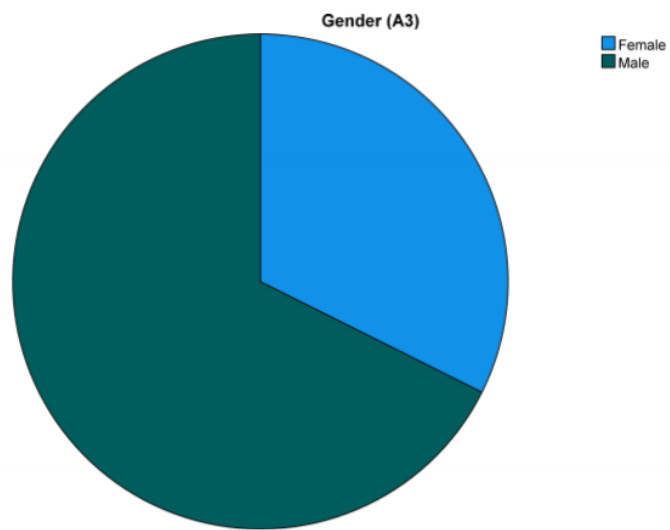
		Factory location (A2)	Gender (A3)	Age group (A4)	Current position (A5)	Department / Section (A6)
N	Valid	139	139	139	139	139
	Missing	0	0	0	0	0

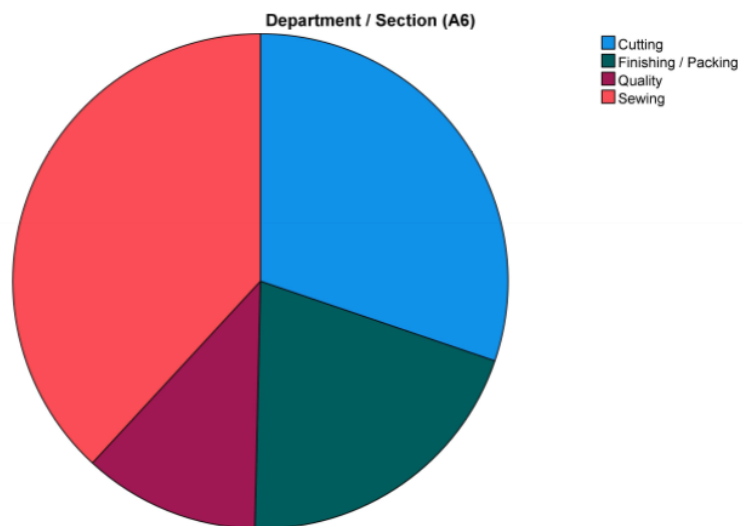
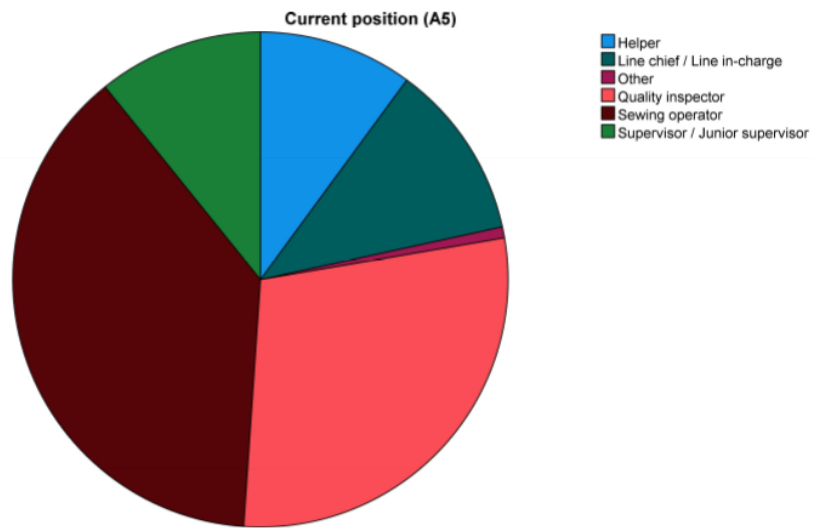
Statistics

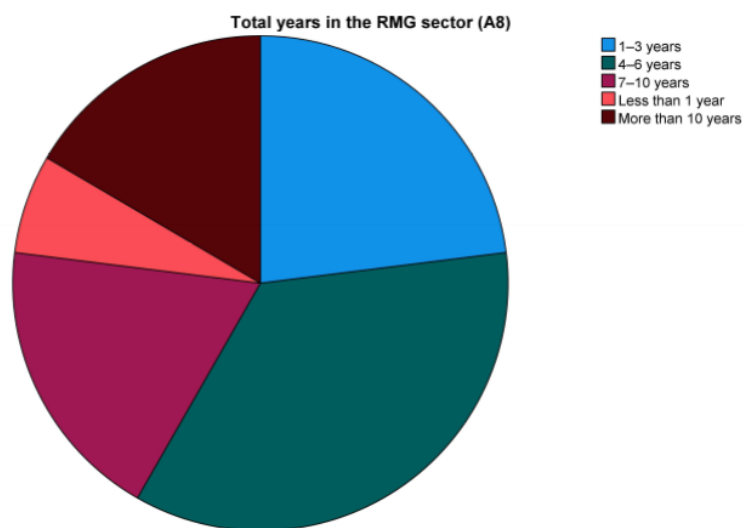
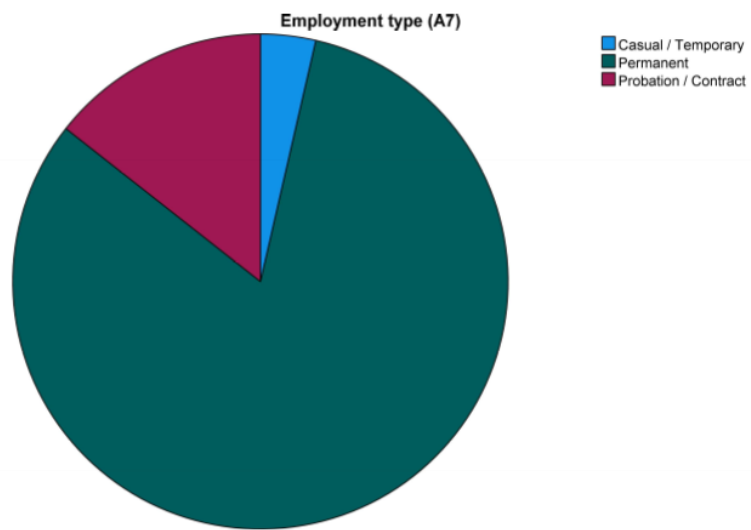
		Employment type (A7)	Total years in the RMG sector (A8)	Years working in this factory (A9)	Highest education level completed (A10)
N	Valid	139	139	139	139
	Missing	0	0	0	0

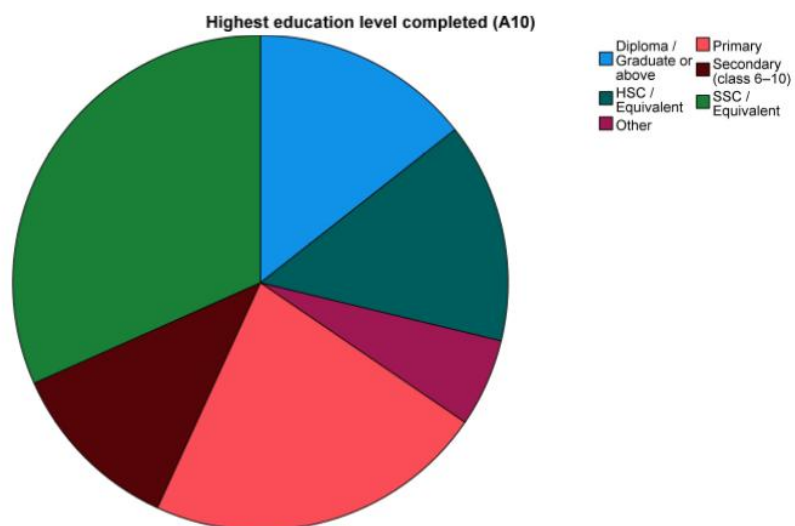
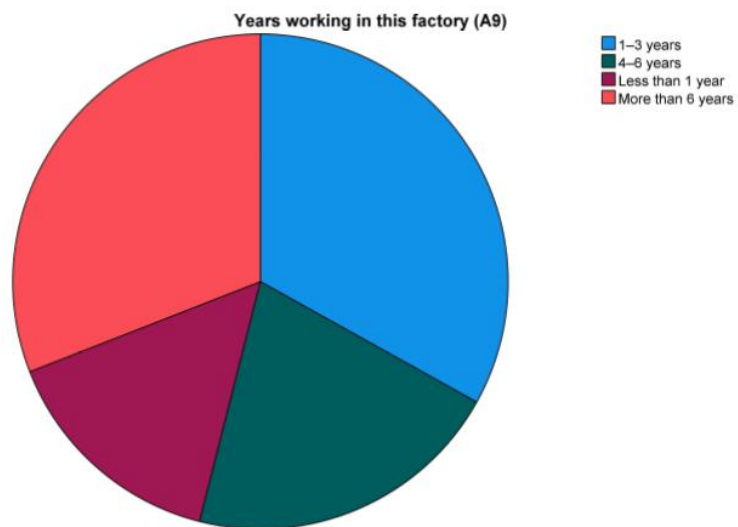
Pie Chart











```

FREQUENCIES VARIABLES=FactorylocationA2 GenderA3 AgegroupA4 CurrentpositionA5 Depart
ntSectionA6
    EmploymenttypeA7 TotalyearsinthetRMGsectorA8 YearsworkinginthisfactoryA9
    HighesteducationlevelcompletedA10
/FORMAT=NOTABLE
/BARCHART PERCENT
/ORDER=ANALYSIS.
  
```

Frequencies

Statistics

		Factory location (A2)	Gender (A3)	Age group (A4)	Current position (A5)	Department / Section (A6)
N	Valid	139	139	139	139	139
	Missing	0	0	0	0	0

Statistics

		Employment type (A7)	Total years in the RMG sector (A8)	Years working in this factory (A9)	Highest education level completed (A10)
N	Valid	139	139	139	139
	Missing	0	0	0	0

Bar Chart

