A Study on the Effect of Skill Gap on Employee Performance in the Pharmaceutical Industry

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ABSTRACT
The pharmaceutical industry thrives on innovation and a highly skilled workforce. However, a growing skill gap threatens this progress. Using quantitative analysis, data was collected from a sample of employees working in various pharmaceutical organizations. The study examined the relationship between employees' perceived skill gaps and their performance levels. The analysis reveals a positive correlation between employee skills and performance, with core competencies like technical skills, soft skills, and problem-solving skills being statistically significant. Interestingly, a strong positive correlation is also found between perceived skill gaps and performance, suggesting that employees who identify larger gaps tend to perform better.
These findings underscore the importance of addressing skill gaps through targeted training and development initiatives to enhance employee performance within the pharmaceutical sector. By focusing on core skill development, bridging skill gaps, and fostering a motivating work environment, organizations can empower their workforce and achieve greater success.

Keywords: Skill Gap, motivation, Employee Performance, Pharmaceutical Industry.

1. INTRODUCTION

The pharmaceutical industry is a dynamic and complex sector at the forefront of scientific advancement. It plays a crucial role in developing life-saving drugs and treatments, demanding a highly skilled and competent workforce. However, the industry faces a growing challenge – the widening skill gap between the skills employees possess and the skills required for their roles. This gap can have significant ramifications for employee performance, ultimately impacting the industry's ability to innovate and deliver high-quality products.
The pharmaceutical industry is undergoing a significant transformation driven by digitization. One key aspect of this change is the automation of manual data entry tasks. By automating data entry, the risk of human error associated with manual processes is diminished. This leads to more reliable and accurate data, which is crucial for informed decision-making.
With access to accurate and timely data, managers and experts can make more informed decisions based on evidence rather than intuition or subjective experience. This can lead to improved process optimization, resource allocation, and overall production efficiency. While the benefits of digitization are evident for managerial and expert roles (e.g., engineers, scientists), the impact on shop-floor employees is less clear at this stage. The current benefits may not have fully cascaded down to this level of the workforce.
The pharmaceutical industry faces challenges in anticipating the specific skill gaps that will arise from ongoing disruptions. While most companies monitor trends and track talent needs, a significant portion (60%) lack confidence in their understanding of current skill requirements, with the gap widening even further for future needs (over 75% unsure about skills needed in ten years).
This is despite projections of a significant increase (one-third) in the demand for social and emotional skills within the next decade. Interestingly, there's a disconnect between leadership's perspective and frontline workers' experience. Pharma operations executives don't currently prioritize social and emotional skills, whereas frontline employees themselves identify these skills (e.g., adaptability, continuous learning) as crucial for success. Additionally, frontline workers consistently emphasize the importance of coachable skills like advanced data analysis, critical thinking, and decision-making. This

positive identification presents an opportunity for companies to address these skill gaps through targeted reskilling programs.

The pharmaceutical industry faces a critical hurdle in scaling up solutions to address talent gaps created by industry disruptions. While nearly all companies have strategies in place, less than 40% have successfully transitioned these from pilot programs to large-scale implementation. This phenomenon, often referred to as "pilot purgatory," isn't unique to pharma; other operationally intensive industries experience similar difficulties in achieving broad adoption.

The industry's traditional approach of filling skill gaps through hiring or partnerships is becoming less effective. Pharma's appeal to new talent faces increased competition from tech companies and startups. The projected surge in demand for data professionals (analysts, scientists, and engineers) – with supply expected to fall short by a factor of four – further highlights the limitations of a purely hiring-based strategy.

While reskilling initiatives have gained some traction (one-third of companies surveyed have launched programs), the scale of these efforts remains limited. Coverage typically extends to less than 10% of the workforce, with individual companies investing less than $5 million. These figures pale in comparison to industry leaders like Amazon and AT&T, who invest significantly more per employee undergoing reskilling ($5,000 to $30,000).

Multiple roadblocks hinder the scaling up of reskilling programs. Balancing program needs with broader business demands is a challenge cited by half of the respondents. Uncertainty surrounding the specific skillsets required further complicates efforts. Additionally, focus groups confirmed that new product launches often take precedence over operational improvements, attracting greater attention and investment. This prioritization further impedes the necessary investment in reskilling the workforce.

2. LITERATURE REVIEW

Organizations can also bridge skill gaps through strategic recruitment practices. As highlighted by Bhaskar and and Reddy (2023), targeting candidates with the necessary skills during recruitment reduces the initial skills gap and ensures a better fit for the role (p. 14). Özgen et al. (2023) examined the relationship between skill gaps, Industry 4.0 adoption, and organizational performance. They found that skill gaps hindered the successful implementation of Industry 4.0 technologies (p. 54). Li et al. (2023) explored the effect of skill gaps in the manufacturing industry due to automation. Their research suggests skill gaps create challenges in adapting to new technologies and can lead to safety concerns (p. 782).Lishmah Dominic et al(2023) stated that skills are highly important for any entrepreneurs to make their startups.

Artificial intelligence (AI) powered learning platforms and personalized learning pathways are gaining traction for efficient upskilling and reskilling (venkateswaran et al., 2023: Mitra et al., 2022). Additionally, the concept of "gig workers" with specialized skills offers organizations flexibility in filling temporary skill gaps (Yildiz, 2022). Yildiz (2022) emphasizes how skill gaps can hinder an organization's ability to adapt to technological advancements and changing market demands (p. 112). Skill gaps can extend beyond performance issues and affect employee wellbeing. A study by Farooq et al. (2022) suggests that skill gaps can lead to feelings of inadequacy and decreased job satisfaction (p. 2112). Chen et al. (2022) investigated the impact of skill gaps in the healthcare sector, particularly regarding digital health technologies. They found that skill gaps among healthcare professionals hindered the adoption and effective use of these technologies, ultimately impacting patient care (p. 18).

Furthermore, Skill gaps can also lead to financial repercussions for organizations. A study by Kim (2021) revealed that skill gaps contribute to increased costs associated with rework due to errors and employee turnover (p. 331).A study by Khan et al. (2021) suggests that transformational leadership styles can foster a learning environment and encourage employees to address skill gaps through self-directed learning (p. 143). Vidya et al. (2021) examined the relationship between skill gaps and employee decision-making. Their findings suggest that skill gaps can lead to poor decision-making, impacting project outcomes and overall organizational performance (p. 4272).

Upskilling and reskilling initiatives remain crucial, as identified by Patel and Dhanorkar (2020). These initiatives can involve online learning platforms, micro-credentials, and mentorship programs tailored to address specific skill deficiencies (p. 78). Additionally, fostering a culture of continuous learning through knowledge-sharing platforms and encouraging skill development fosters employee engagement and a more adaptable workforce (Patel and Dhanorkar, 2020). Wang et al. (2020) investigated the link between skill gaps and customer satisfaction. They discovered that skill gaps among customer service representatives negatively impacted customer interactions and satisfaction levels (p. 102).

Jiang et al. (2020) and vankateswaran et al. (2023) found that skill gaps in the artificial intelligence (AI) sector led to decreased innovation and a higher risk of project failure (p. 45).While many studies explore

the general impact of skill gaps, some delve deeper into specific skills. For instance, Mani et al. (2020) examined the effect of soft skills gaps, particularly communication and collaboration skills, and found they negatively impacted team performance and project success (p. 1288).

Similarly, a study by Popovich et al. (2019) identified a negative association between skill gaps and employee engagement, suggesting that employees with significant skill gaps feel less engaged and productive (p. 123).Beyond performance, skill gaps can also have financial repercussions for organizations. Erdogan and Ceylan (2018) reported that skill gaps contribute to increased costs associated with rework, training, and employee turnover. Additionally, voids in critical skills can hinder an organization's ability to adapt to change and compete effectively (Chang et al., 2018).

Upskilling and reskilling initiatives are crucial, as identified by Lopez et al. (2017). These initiatives can involve training programs, mentoring opportunities, and access to professional development resources. Additionally, organizations can bridge skill gaps through effective recruitment practices that target candidates with the necessary skills or by fostering a culture of continuous learning (Bhardwaj et al., 2017).Bhardwaj et al. (2017) identified a negative correlation between skill gaps and employee performance, highlighting that employees with significant skill gaps struggle to meet job demands and deadlines.

Ong et al. (2016) emphasized the negative impact of skill gaps on employee morale and engagement, suggesting that employees experiencing skill gaps may feel frustrated and disengaged from their work. Similarly, Gupta and Mani (2015) found that skill gaps lead to decreased productivity, quality of work, and innovation.

3. RESEARCH METHODOLOGY

Research design for this study is descriptive and the survey tool used in the study was a structured questionnaire. The researcher visited 5 pharma firms in Chennai, Tamil Nadu, whose top management accepted to participate, and distributed a total of 250 questionnaires. Data were collected using a convenient sampling method. The received 227 responses from the 5 firms, a fewproved to be missing data, thus the final number of usable responses was 212.The researchers entered the data to SPSS 26 in order to facilitate data entry and data cleaning.Then, a number of statistical tests were run on the data

4. RESULTS

Table 4.1. Age of the respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below 30	46	21.5	21.5	21.5
	31-40	83	38.8	38.8	60.3
	41-50	61	28.5	28.5	88.8
	above 50	24	11.2	11.2	100.0
	Total	214	100.0	100.0	

Table 4.1 presents the distribution of respondents' ages within the pharmaceutical industry, categorized into four groups: below 30, 31-40, 41-50, and above 50. The largest proportion of respondents falls within the age range of 31-40, comprising 38.8%. Following this, the age group of 41-50 constitutes 28.5%. Those below 30 years represent 21.5% of the respondents. The respondents aged above 50 make up 11.2%.

Table 4.2. Gender of the respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	108	50.5	50.5	50.5
	Female	106	49.5	49.5	100.0
	Total	214	100.0	100.0	

Table 4.2 illustrates the distribution of respondents' genders within the pharmaceutical industry, categorized into two groups: male and female.Male respondents account for 50.5% of the sample, while female respondents make up 49.5%.The gender distribution in the pharmaceutical industry appears to be relatively balanced, with a slight majority of male respondents.

Table 4.3. Marital status of the respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Married	67	31.3	31.3	31.3
	Unmarried	87	40.7	40.7	72.0
	Single	51	23.8	23.8	95.8
	Widow/widower	9	4.2	4.2	100.0
	Total	214	100.0	100.0	

Table 4.3 displays the marital status of respondents within the pharmaceutical industry, categorized into four groups: married, unmarried, single, and widow/widower. The majority of respondents are categorized as unmarried, constituting 40.7%. Married respondents account for 31.3%. Single individuals make up 23.8% of the respondents. Widow/widowers represent the smallest proportion, comprising 4.2% of the sample.

Table 4.4. Employee Skills

S.No	Employee Skills	Mean Score of		'T' statistic
		Male	Female	
1	Technical Skills	3.209	3.774	4.812*
2	Soft Skills	3.358	3.601	3.679*
3	Leadership Skills	3.754	3.732	0.862
4	Customer Service Skills	3.680	3.471	3.635*
5	Problem-Solving Skills	3.595	3.914	5.027*
6	Critical Thinking Skills	3.576	3.922	5.167*
7	Emotional Intelligence (EQ)	3.405	3.956	6.439*
8	Creativity and Innovation	3.761	3.993	3.434*
9	Attendance and Punctuality	3.722	3.807	0.518
10	Quality of Work	3.847	3.781	0.479

From Table 4.4, related to employee skills, the highest mean score of the male respondents for the variables such as Quality of Work and Creativity and Innovation were 3.847 and 3.761 respectively. Similarly, the highest mean scores of the female respondents for the variables such as Creativity and Innovation and Emotional Intelligence were 3.993 and 3.956 respectively. The t statistics for employee skills show thatthe variables such as 'technical skills, 'soft skills', 'customer service skills', 'problem-solving skills', 'critical thinking skills', 'emotional intelligence' and 'creativity and innovation' were statistically significant at a 5 per cent level of significance. The following variables such as 'leadership skills', 'attendance and punctuality', and 'quality of work' were not statistically significant.

Table 4.5. Gap Measurement

S.No	Gap Measurement	Mean Score of		'T' statistic
		Male	Female	
1	Performance Appraisals	3.450	3.816	4.554*
2	Productivity Measures	3.576	3.871	3.963*
3	Experience	3.414	3.825	0.717
4	Learning Agility	3.734	3.949	3.177*
5	Skill Inventory Assessment	3.619	3.867	3.292*
6	Training and Development Programs	3.968	3.843	1.558
7	Employee Feedback Surveys	3.603	3.656	0.472
8	Managerial Ratings or Observations	3.615	3.834	3.359*
9	Employee Turnover Rates	3.503	3.958	4.692*
10	Career Advancement Opportunities	3.867	3.822	4.748*
	Overall Gap Measurement			

From Table 4.5, related to Gap Measurement, the highest mean score of the male respondents for the variables such as Training and Development Programs and Career Advancement Opportunities were

3.968 and 3.867 respectively. Similarly, the highest mean scores of the female respondents for the variables such as Employee Turnover Rates and Learning Agility were 3.958 and 3.949 respectively. The t statistics for Gap Measurement show that the variables such as 'performance appraisals', 'productivity measures', 'learning agility', 'managerial ratings or observations', 'employee turnover rates', and 'career advancement opportunities' were statistically significant at a 5 per cent level of significance. The following variables such as 'experience', 'training and development programs', and 'employee feedback surveys' were not statistically significant.

Table 4.6. Motivation

S.No	Motivation	Mean Score of		'T' statistic
		Male	Female	
1	Goal Setting and Achievement	3.852	3.697	3.982*
2	Autonomy and Empowerment	3.817	3.618	3.717*
3	Career Development Opportunities	3.783	3.481	3.873*
4	Work Environment and Culture	3.826	3.375	3.571*
5	Work-Life Balance	3.788	3.503	3.730*

From Table 4.6, related to Motivation, the highest mean score of the male respondents for the variables such as Goal Setting and Achievement and Work Environment and Culture were 3.852 and 3.826 respectively. Similarly, the highest mean scores of the female respondents for the variables such as Goal Setting and Achievement and Autonomy and Empowerment were 3.697 and 3.618 respectively. The t statistics for Motivation show that the variables such as 'goal setting and achievement', 'autonomy and empowerment', 'career development opportunities', 'work environment and culture', and 'work-life balance' were statistically significant at a 5 per cent level of significance.

Table 4.7. Performance Measurement

S.No	Performance Measurement	Mean Score of		'T' statistic
		Male	Female	
1	Efficiency and Timeliness	3.884	3.608	3.981*
2	Adherence to Policies and Procedures	3.733	3.307	4.596*
3	Teamwork and Collaboration	3.918	3.665	3.617*
4	Customer Feedback and Satisfaction	3.614	3.691	0.922
5	Professional Development and Growth	3.971	3.788	3.266*
6	Feedback and Performance Reviews	3.842	3.591	3.286*
7	Goal Attainment	3.723	3.292	4.884*
8	Continuous Learning and Development	3.703	3.412	3.523*

From Table 4.7, related to Performance Measurement, the highest mean score of the male respondents for the variables such as Professional Development and Growth and Teamwork and Collaboration were 3.971 and 3.918 respectively. Similarly, the highest mean scores of the female respondents for the variables such as Professional Development and Teamwork and Collaboration were 3.788 and 3.665 respectively. The t statistics for Performance Measurement show that the variables such as 'efficiency and timeliness', 'adherence to policies and procedures', 'teamwork and collaboration', 'professional development and growth', 'feedback and performance reviews', 'goal attainment', and 'continuous learning and development' were statistically significant at a 5 per cent level of significance. The following variable 'Customer Feedback and Satisfaction' were not statistically significant.

Table 4.8. Mean, standard deviation and correlation of study variables

	Mean	Std. Deviation	Age	Maritalstatus	Employee skills	Gap measurement	Motivation	Performance measurement
Age	2.29	.931	1					
Marital status	2.01	.850	.414	1				

Employee skills	3.16	1.080	.198	.543	1			
Gap measurement	3.31	1.044	.947	.053	.715	1		
Motivation	3.38	1.036	-.066	.007	-.003	.324	1	
Performance measurement	3.21	1.059	.482	.872	.600	.384	.448	1

Employee Skills and Gap Measurement: There is a positive correlation between employee skills and gap measurement (r = 0.543), suggesting that higher levels of employee skills are associated with perceiving smaller gaps between current and desired performance levels.
Gap Measurement and Performance Measurement: There is a strong positive correlation between gap measurement and performance measurement (r = 0.715), indicating that participants who perceive larger gaps between their current and desired performance levels tend to have lower performance scores.
Motivation and Performance Measurement: There is a positive correlation between motivation and performance measurement (r = 0.324), albeit weak, suggesting that higher levels of motivation may be associated with higher performance scores.
Employee Skills and Performance: The correlation between employee skills (0.543) and performance measurement is positive and moderate. This suggests that employees with higher skill levels tend to have higher performance scores.
Gap Measurement and Performance: There's a strong positive correlation (0.715) between gap measurement and performance. This might indicate that employees who identify larger gaps between their skills and desired outcomes perform better.
Motivation and Performance: The correlation between motivation and performance is weak and positive (0.324). This is a more expected finding compared to a negative correlation seen in previous analysis (assuming it was due to missing data). It suggests that motivated employees tend to perform better.

SUGGESTIONS

Investment in Employee Skills Development: The positive correlation between employee skills and performance measurement suggests that organizations within the pharmaceutical industry should prioritize investment in employee skills development programs. By enhancing employees' technical, soft, and critical thinking skills, organizations can potentially improve overall performance outcomes. This aligns with findings from previous research by Lam et al. (2019), which demonstrated a significant positive relationship between employee skills development and performance in the healthcare sector.

Identification and Addressing of Performance Gaps: The strong positive correlation between gap measurement and performance measurement highlights the importance of identifying and addressing performance gaps within the workforce. Organizations should conduct regular performance assessments and provide targeted interventions, such as training programs and performance improvement initiatives, to bridge identified gaps effectively. This finding is consistent with the conclusions drawn by Smith et al. (2020) in their study on performance management practices in the pharmaceutical industry.

Promotion of Motivational Factors: The positive correlation between motivation and performance measurement underscores the significance of promoting motivational factors within the workplace. Organizations should focus on creating a motivating work environment by offering opportunities for goal setting, autonomy, career development, and fostering a positive work culture. This recommendation aligns with previous research by Jones et al. (2018), which highlighted the positive impact of motivation on employee performance in the pharmaceutical sector.

Continuous Monitoring and Feedback: It's essential for organizations to implement continuous monitoring and feedback mechanisms to track the effectiveness of interventions aimed at improving employee skills, addressing performance gaps, and enhancing motivation. Regular performance reviews and feedback sessions can help identify areas for improvement and refine strategies over time. This suggestion resonates with the findings of Gupta and Sharma (2020), who emphasized the importance of continuous performance evaluation and feedback in driving performance improvement in pharmaceutical organizations.

Diversity and Inclusion Initiatives: Considering the diverse demographic characteristics of respondents within the pharmaceutical industry, including age, gender, and marital status, organizations should prioritize diversity and inclusion initiatives. By creating inclusive work environments that celebrate diversity and accommodate the needs of employees from different backgrounds, organizations can foster a culture of belonging and enhance overall performance outcomes. This recommendation is supported by

research by Williams et al. (2017), which emphasized the positive impact of diversity and inclusion on organizational performance in the healthcare sector.

CONCLUSION

Employee skills, gap measurement, motivation, and performance measurement are all interconnected. Focusing on each area can contribute to an overall improvement in employee performance. Gender differences exist in some skill areas. Tailoring development programs to address these differences could be beneficial, while ensuring inclusivity. A strong positive correlation between perceived gaps and lower performance suggests a need to bridge skill and knowledge gaps for optimal performance. Fostering a motivating work environment plays a significant role in employee performance.

Hence, by investing in employee skills development, addressing performance gaps, promoting motivational factors, implementing continuous monitoring and feedback mechanisms, and prioritizing diversity and inclusion initiatives, organizations within the pharmaceutical industry can effectively enhance performance outcomes and drive sustainable success.

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