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Research Article

Optimizing Call Center Productivity through Key Work Environment Factors

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ABSTRACT

This study aims to enhance productivity by fostering a business environment where workers can thrive, similar to a well-functioning ecosystem. It investigates whether factors such as workers' aptitude, training, tools and technology, workload, workplace relationships, working conditions, employee well-being, and satisfaction with compensation positively impact productivity. The study focused on call center agents in Cebu Province, Philippines, with an estimated population of 200,000. Using a Cochran calculation, a sample size of 384 respondents was determined, accounting for a 5% margin of error and a 95% confidence level. Due to challenges in reaching participants, convenience sampling was employed, yielding 385 completed surveys, exceeding the minimum required. Data was collected through a descriptive survey with simple, close-ended questions, validated by call center agents and demonstrating high reliability (Cronbach's alpha of 0.967). The weighted mean for each predictor and the dependent variable was calculated, and linear regression analyses examined the relationships between predictors and productivity. Additionally, ANOVA within the context of linear regression assessed the significance of these relationships. The findings revealed that the eight identified predictor variables collectively received an average score of 3.277 out of 4.0 from call center agents. All eight predictors—employee aptitude, work training, tools and technology, workload, satisfaction with compensation, employee well-being, working conditions, and workplace relationships—were significant indicators of productivity and explained a portion of the variance in the dependent variable. These results emphasize the need to enhance activities and policies related to all predictor variables, as each significantly impacts productivity. Notably, working conditions and job training received the highest ratings, indicating strong employee satisfaction in these areas. However, urgent attention is needed in addressing employee well-being and satisfaction with compensation, which received the lowest ratings.

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Introduction

This study aims to enhance productivity by fostering an environment that enables workers to thrive within a business organization, much like an ecosystem. Labor productivity, defined as the output produced per hour worked or per worker, reflects the efficiency with which labor is utilized in the production process (Statistics on Labor Productivity - ILOSTAT, n.d.). The research explores the relationship between various factors that may positively influence productivity, considering these factors as potential catalysts for improving employee performance.

Employee aptitude is one factor that can significantly impact productivity. Research on enhancing employee performance has shown that positive individual traits, such as optimism and personal strength, can boost workplace performance (Kour et al., 2019). Another key factor is work training. A study in the utilities sector found that training positively affects labor productivity, highlighting the importance of investing in human capital (Pedrini & Cappiello, 2022). Additionally, productivity can be enhanced through tools and technology. For instance, research on the impact of positive selection technology on seed yam productivity demonstrated a significant increase in farm productivity compared to scenarios without the technology (Osei-Adu et al., 2024). Moreover, an appropriately balanced workload is essential for improving productivity. A study of call center agents found that workload, among other factors, positively influences job performance (Niere et al., 2024). These factors are closely tied to the employee's immediate working environment.

Several other factors also influence employee productivity, each playing a crucial supporting role. One key factor is positive workplace relationships, as research has shown that interpersonal conflicts can decrease productivity (Bălaşa et al., 2023). Another important factor is the physical working conditions, with studies indicating a significant correlation between the quality of these conditions and productivity (Korang-Yeboah & Buobi, 2021). Employee well-being is also a critical variable; studies suggest that workplace friendships and overall well-being positively impact productivity (Imaduddin, 2024). Furthermore, employee satisfaction with compensation is essential, as it has a strong influence on productivity levels (Sitorus & Hidayat, 2023). While these factors are not directly related to the immediate work environment, they play vital roles in shaping overall employee productivity.

The study examined several key factors influencing employee productivity, including workers' aptitude, training, tools and technology, workload, workplace relationships, working conditions, employee well-being, and satisfaction with compensation. Using linear regression analyses, the research explored the relationships between these factors and employee productivity. Conducted in Cebu Province, Philippines, the study specifically targeted call center agents, a group of approximately 200,000 individuals who are vital to the province's economy. The aim was to identify strategies that could optimize employee productivity and, in turn, enhance overall organizational effectiveness. The findings offer valuable insights not only for the specific work environment studied but also for improving productivity across diverse workplace settings.

The research examined the factors potentially impacting the productivity of call center agents in Cebu, Philippines, by analyzing their experiences. It identified several areas that could influence productivity and explored the levels and relationships among these variables to provide relevant implications. Specifically, the study aimed to answer the following questions: 1) What are the identified potential predictor variables influencing the productivity of call center agents? 2) What are the levels and relationships among these predictor variables as experienced by call center agents in Cebu? 3)

Do the predictor variables significantly explain some of the variance in productivity? 4) Based on the findings, what are the implications of the identified predictor variables for productivity in the context of call centers in Cebu?

Literature Review

Workers' Aptitude

Aptitude is a cognitive tendency linked to a specific context (Pavlekovic & Roehr-Brackin, 2024), with the context of this study being the job of a call center agent. In the realm of science careers, aptitude can be defined as the capacity to learn and grow into the ability to understand and produce information related to natural events in both life and work (Lee & Kwon, 2024). Additionally, specific aptitudes often support related aptitudes; for example, individuals with one aptitude may possess others that are similar. Research by Upadhya et al. (2023) found a positive correlation between auditory spatial perception and musical skill. Similarly, studies have shown that language aptitude is positively associated with formal multilingualism, anxiety, and metalinguistic knowledge (Calafato, 2024). Another key feature of aptitude is the ability to improve over time. Immersive education, for example, has been shown to enhance aptitude, with research indicating that service learning improves students' understanding of educational goals and pedagogical content (García-Rico et al., 2021b). Similarly, exposure to classical music activities in young children has led to improved musical aptitude (D. H. Kim & Kim, 2024). Research on aptitude development emphasizes the importance of offering specialized activities to address individual aptitude deficiencies (Anche, 2024). Furthermore, simulated interactions without direct feedback have been found to enhance learning, particularly for learners with lower aptitude (Macedonia et al., 2023). Finally, aptitude is measurable, and studies on aptitude tests for language learning have demonstrated satisfactory reliability (Pan & Marsden, 2024).

Employees must possess the requisite aptitude to perform their duties effectively. Different types of employment require specific aptitudes. For example, research on the relationship between worker aptitude and construction labor productivity found that physical aptitude has a greater impact on performance than cognitive aptitude (Johari & Jha, 2020). However, aptitude tends to decline with age. Studies have shown that retirees exhibit lower implicit aptitude compared to those who are still employed (Roehr-Brackin et al., 2023), and teaching aptitude, in particular, diminishes with age for both men and women (Bijender et al., 2023). Aptitude can also be influenced by health conditions. For instance, managing work-related asthma is crucial to prevent declines in quality of life and work productivity (Suarthana et al., 2024). Additionally, individuals with multiple sclerosis experience a gradual decrease in work productivity over time (Bessing et al., 2021). Depressive symptoms are another factor affecting aptitude. Research indicates that individuals with severe depressive symptoms experience significantly poorer health-related quality of life, greater work productivity loss, and higher indirect costs (Kato et al., 2021). Addressing depressive symptoms through behavioral interventions, such as mindfulness, can help mitigate their impact on work productivity (Crespi et al., 2024).

Work Training

Research has shown that work training enhances productivity, with studies indicating that on-the-job training is significantly related to job readiness (Prayitno et al., 2023; Aljumah, 2023). More importantly, work training has been found to have a positive and significant effect on employee performance (Andri & Mandataris, 2023b; Hasan et al., 2023; Ichbal & Ubaidillah, 2023; Nathiqah & Pancasasti, 2022; Sellar, 2022; Susilo & Kasmir, 2022; Wulandari et al., 2023). In addition to boosting productivity, work training also improves job satisfaction. Several studies confirm that employee training directly influences job satisfaction (Riyanto et al., 2023; Astuti & Harnuansa, 2022; Diantari, 2023; Rimadianti & Supartha, 2023). For example, in the beauty service industry, training enhanced workers' competence, including skills, knowledge, and attitude, which led to higher job satisfaction and improved job performance (Kim et al., 2023).

Training encompasses both knowledge and skills essential for employee performance. Research shows that employee productivity is closely linked to the acquisition of relevant theoretical and operational knowledge (Manoharan et al., 2022). Training can be delivered through various teaching styles, enhancing its effectiveness (Narisco et al., 2023; Narsico et al., 2023b). Moreover, the perception of training itself positively impacts job satisfaction and reduces workplace stress (Şeşen & Ertan, 2021). Additionally, highly trained workers are better equipped to handle routine tasks effectively (Schoger, 2023). Training is also a dynamic process, requiring continuous adaptation to meet changing job demands (Narsico & Narsico, 2023b).

Tools and Technology

From a macro perspective, research has demonstrated that technological change is a primary driver of productivity growth (Shah et al., 2023). Similarly, technological advancements have been identified as the key factor influencing productivity changes among the Group of Twenty (G20) countries, an international forum for governments and central bank governors from 19 countries and the European Union (Shah et al., 2024). Financial technology has also been found to positively enhance firm productivity (Wang et al., 2024). Additionally, studies suggest that low-carbon energy technology contributes to green total factor productivity, addressing concerns about global warming (Zhao, 2023). Moreover, material productivity and environment-related technologies have been shown to reduce environmental degradation (F. Chen et al., 2023).

In the field of information and communication technology (ICT), research consistently shows a positive relationship between ICT adoption and productivity. Ogunwole et al. (2024) found that ICT positively influences both employment and productivity. Similarly, Abdelsadek and Kacem (2022) discovered that decision-support tools, which optimize delivery processes, enhance productivity by improving resource utilization and streamlining logistics management. In another study, Andres et al. (2024) highlighted that digitizing microfinancing operations significantly improves operational processes. Furthermore, Pan et al. (2024) emphasized the critical role of ICT in modern businesses, demonstrating that advancements in digital technology lead to heterogeneous effects on Total Factor Productivity (TFP), a metric that gauges the efficiency of all inputs in the production process.

With the advent of artificial intelligence (AI), research has highlighted its transformative impact on academic writing and research across various domains (Khalifa & Albadawy, 2024). Additionally, AI tools have been shown to positively influence employee productivity by assisting management and streamlining routine tasks (N. R. Ahmed et al., 2024). Despite these advancements, human intervention remains essential. For example, Y. Zhao et al. (2024) found that human capital fully mediates the relationship between industrial robots and labor productivity. On a simpler level, operational work tools have been proven to significantly enhance employee performance through increased productivity (Taliang et al., 2023). Furthermore, people's interest in technology grows when they experience its positive effects firsthand (Narsico & Narsico, 2023).

Workload

Research on the effect of workload on job performance has found that assigning work in a manner that does not overwhelm employees can improve their performance (Herawati et al., 2023). Similarly, studies on improving employee performance reveal that effective workload management positively impacts performance (Jannah & Sumartik, 2023). In the context of business processing organizations, workload has been identified as a key determinant of employee productivity (Niere et al., 2024). Furthermore, a study on the work activities of logistics couriers showed that workload has a positive and significant effect on work productivity (Nathiqah & Pancasasti, 2022).

From the perspective of workload and job satisfaction, several studies have highlighted a significant relationship between these variables. For instance, research on life satisfaction predictors in elementary school teachers emphasized the role of workload in both job satisfaction and overall life satisfaction (Cayupe et al., 2023). Similarly, a cross-sectional study in

an emergency department found that staff members experienced higher levels of job satisfaction due to favorable workload factors (Batarfi et al., 2023). Additionally, a study of nurses in adult inpatient units revealed a strong connection between workload and job satisfaction (Gil et al., 2022).

From the perspective of work overload, studies have highlighted various scenarios. A case study of public sector universities provided clear evidence that when employees experience stress from being overloaded with work, their job performance is negatively impacted (Haq et al., 2020). Similarly, research on the effect of perceived organizational support on job stress found that work overload significantly increases work-related stress (Purnama et al., 2023). In line with this, a study on workplace stressors, employee welfare, and productivity identified work overload as a major source of workplace stress (Niere et al., 2023). Work overload also has a significant impact on employee turnover intentions. A study on the influence of work overload on turnover intentions revealed a direct relationship between work overload and the intention to leave (Hakro et al., 2022). Additionally, another study found a strong connection between work overload and turnover intentions, with emotional exhaustion serving as a significant mediator (Ali et al., 2021).

Workplace Relationships

Several studies highlight the strong link between workplace relationships and job performance. For example, a study on workplace relationship quality and job performance found that positive relationships between employees and supervisors, as well as among co-workers, significantly contribute to job performance (Gerlach, 2019). Similarly, research on transforming role conflict into improved performance showed that a positive relationship between front-line employees and managers enhances the effect of job satisfaction on creativity and service performance (Kalra et al., 2023). Another study revealed that high levels of social support at work boost job performance by increasing organizational commitment and encouraging innovative work behavior (Vuong et al., 2022). Additionally, research on authentic and transformational leadership demonstrated that psychological empowerment moderates the relationship between leadership styles and innovative work behavior (Grošelj et al., 2020). Finally, a study on job performance management, social support, and work-life conflict found that social support reduces workplace stress and work-life conflict, ultimately enhancing job performance (Foy et al., 2019).

Healthy workplace relationships foster a positive work environment, which is crucial for enhancing job performance. A study on the effect of the work environment on job performance found that a positive work environment has a direct, beneficial impact on employee performance (Yusnita, 2023). Similarly, research examining the influence of leadership and work environment on job satisfaction revealed that a supportive work environment significantly boosts both job satisfaction and employee performance (Assiddiki, 2023). Additionally, Bella (2023) emphasizes the importance of organizations prioritizing the cultivation of positive relationships, promoting teamwork, and creating a supportive work environment to improve job satisfaction and overall employee wellbeing.

From the perspective of work flexibility, a study on work engagement and job performance in a hybrid workplace revealed that flexible work, as opposed to telework, has a significant and positive effect on job performance. The study also found that flexible work enhances work engagement, and that work engagement significantly mediates the relationship between flexible work and job performance (Naqshbandi et al., 2023). Similarly, research on the effects of workplace interventions on daily stressor reactivity indicated that positive changes in work environments, such as increased supervisor support and flexible scheduling, can promote employee health and well-being by improving affective responses to common daily stressors at work (Leger et al., 2022). Furthermore, a study on the role of trust in different workplace employment relations regimes found that strong mutual trust is associated with significantly higher increases in firm profitability (Brandl, 2021).

Working Conditions

A crucial aspect of working conditions is indoor environment quality. A study on office workers' productivity and the power consumption of air conditioners revealed that mixed-mode ventilation improved the productivity of male participants, suggesting that this approach could reduce air conditioning power consumption while enhancing productivity during springtime (Arata & Kawakubo, 2022). Another study identified noise and air quality as key predictors of workers' perceptions of their productivity, comfort, and health (Rasheed et al., 2021). Research on the impact of thermal comfort on productivity in office buildings confirmed that productivity depends on various indoor environmental factors (Kaushik et al., 2020). Additionally, a study involving a multinational logistics provider found that indoor air quality significantly affects employee productivity (Irawan & Sari, 2021). Finally, a study on indoor environmental quality in offices revealed significant associations between environmental quality indicators and the risk of negative effects on office workers' health and productivity. Specifically, poor lighting and acoustical quality were linked to illness and physiological stress (Felgueiras et al., 2023).

Another key factor in working conditions is occupational health and safety, which is closely linked to productivity. A longitudinal study on the impact of occupational health and safety practices found that such interventions can improve the workplace environment and significantly boost employee productivity (Lari, 2024). Similarly, research on workplace safety, employee safety attitudes, and productivity revealed that positive employee safety attitudes significantly mediate the relationship between workplace safety and employee productivity (Mutegi et al., 2023). Additionally, a study found that workplace safety ergonomics, emergency management, safety training, and safety transfer significantly affect employees' productive time (Mutegi, Joshua, & Kinyua, 2023). From the opposite perspective, research on workplace safety accidents, employee treatment, and firm value showed that workplace safety accidents reduce employee productivity (Dai et al., 2022). Furthermore, a study on masonry work productivity revealed that self-perceived construction noise exposure has a significant negative impact on productivity (Hong et al., 2023).

Another important factor in working conditions is the physical layout of the work area. A study on the effect of workplace design on employee job engagement found that factors such as office layout, noise levels, air quality, colors, and privacy significantly impact job engagement among employees in public commercial banks (M.M.S. Madushika & R.G. Ariyawansa, 2022). Similarly, research on green office layouts and employee workplace productivity revealed that factors like comfort, office space, and opportunities for interaction significantly influence employee productivity (Rahmat et al., 2023). Additionally, a study on building standardization showed that satisfaction with the physical configuration of space and organizational aspects was generally higher in certified offices (Marzban et al., 2023). Conversely, a study on spatial analysis in work comfort and performance optimization found that irregular office layouts could cause discomfort for employees or other occupants, which negatively impacts work optimization within the organization (Evira & Marliyah, 2022).

Employee Wellbeing

Several studies underscore the positive relationship between employee well-being and productivity. For instance, a study on the economics of mental well-being found that higher levels of mental well-being are associated with significantly less productivity loss (Santini et al., 2022). Research on psychological empowerment and well-being suggested that organizations should enhance perceived organizational support while fostering empowerment and well-being to optimize job performance (Putra et al., 2023). Another study revealed a very strong and significant relationship between well-being, work motivation, and work productivity (Sangadji et al., 2023). Furthermore, research on employee welfare packages and their impact on productivity highlighted that promoting employee well-being can positively influence productivity, engagement, and retention rates (Ufoaroh et al., 2019). Conversely, a study showed that heat stress

negatively impacts health, well-being, family and social relationships, as well as work capacity and productivity (Oppermann et al., 2021).

Several initiatives can significantly promote employee well-being. A study on attitudes towards rest breaks, productivity, and well-being found that taking more breaks outdoors was associated with positive changes in well-being (Walker et al., 2023). Similarly, research on the role of a campus herb garden in promoting social and personal well-being revealed that the garden provided students with a pleasant sensory environment, offering them a chance to physically break from their coursework (Patel et al., 2024). From another perspective, a study on factors affecting English language teacher well-being showed that teachers' intrinsic motivation and the satisfaction gained from learner achievements enhanced their well-being by fostering positive emotions (Sadeghi & Pourbahram, 2024). Moreover, research on emotional well-being in teachers indicated that emotional intelligence, particularly self-regulation of emotions, can predict happiness (Salavera & Urbón, 2024).

Another key aspect of employee well-being is work-life balance. A study revealed that work-life balance, which encourages work flexibility, boosts employee morale and positively impacts organizational productivity (Obinwanne & Kpaji, 2022). Similarly, research on work-life balance found that it has a positive and significant influence on the productivity of the millennial generation (Hidayat & Aulia, 2023). From a different perspective, a study on balancing productivity and well-being highlighted that welfare plays a crucial role in family economic analysis, challenging the notion that profit maximization and self-interest are the only driving factors in decision-making (Ramos, 2021).

A delicate balance between productivity and employee well-being must be maintained within an organization. A study on worker well-being and productivity in advanced economies revealed that the relentless pursuit of productivity growth can be counterproductive, not only harming worker well-being but also impacting long-term productivity (Isham et al., 2021). Furthermore, while overwork reduction measures are often part of Corporate Social Responsibility, they frequently conflict with deeply ingrained institutional incentives, as highlighted in a study on altering the culture of overwork (Kobayashi et al., 2024). This same study emphasizes the importance of strengthening ties between stakeholders to foster a positive and effective work environment and to revitalize institutional processes that are crucial for both worker productivity and long-term societal sustainability.

Satisfaction with Compensation

Typically, compensation is evaluated based on the employee's qualifications and the company's requirements. A study on the impact of university students' core competencies on employment revealed that factors such as globalization, job exploration, and autonomous implementation competencies significantly influence annual salary levels (Yi & Park, 2024). Similarly, a study on salary changes for mining engineers found that supervisors can receive salary increases through premiums linked to operating profits or pit sale prices (Yıldız, 2023).

From the perspective of how employees perceive salaries, several studies offer valuable insights. A study examining the relationship between salary and job satisfaction found that employees with higher monthly salaries were more likely to report higher job satisfaction compared to those with lower salaries (Elsahoryi et al., 2022). Similarly, research on the impact of monetary rewards in referral programs revealed that larger monetary incentives lead to higher product sales (Wang & Ding, 2022). Additionally, a study on the effect of reward frequency on performance showed that increasing the frequency of cash rewards positively impacts overall employee performance (Newman et al., 2022).

Non-monetary rewards also play a significant role in employee compensation. A study on customer incivility as an identity threat for frontline employees found that non-monetary rewards are more effective than monetary rewards in mitigating the negative psychological effects of customer incivility (Boukis et al., 2023). Similarly, research comparing non-monetary and monetary incentives revealed that non-monetary incentives lead to higher performance than either monetary incentives

or the absence of external incentives (Asulin et al., 2023).

Variables as Used in the Context of the Study

In the context of the study, workers' aptitude refers to the knowledge, skills, and attitudes that employees possess prior to entering the workplace, which are essential for excelling in their roles. Work training encompasses both initial training before work assignments and ongoing training aimed at improving job performance, including coaching and specialized training for tools and technology. Tools and technology are the resources that assist employees in performing their tasks while meeting quality standards and productivity requirements. Workload is the proportion of assigned work consistently completed by employees, ensuring that both quality standards and productivity are maintained. Workplace relationships involve the support employees receive from their immediate supervisor and co-workers, which helps facilitate the completion of assigned tasks. Working conditions refer to the physical environment of the workplace, including aspects such as lighting, ventilation, safety, and the structure of the workplace that supports job performance. Employee well-being refers to adequate rest and timely breaks that enable workers to sustain productivity, along with efforts to promote a healthy work-life balance. Finally, satisfaction with compensation reflects the degree to which employees are satisfied with their pay and whether it meets their personal and family needs.

The unique attribute of this study lies in its use of multiple potential variables to assess their impact on the productivity of call center agents. The study examines how each of the eight predictor variables influences productivity, making it distinct from previous research, as no other study has explored all eight factors in the same study. Given that productivity can be influenced by a variety of factors, this study provides valuable insights into which variables may be negatively affecting the productivity of call center agents. These findings can offer actionable guidance on addressing identified issues, helping companies improve employee performance, maintain productivity, and sustain profitability.

Methods

The study aimed to identify potential predictor variables influencing the productivity of call center agents in Cebu, Philippines. Eight key factors were examined: workers' aptitude, work training, tools and technology, workload, workplace relationships, working conditions, employee well-being, and satisfaction with compensation. Data were collected through a descriptive survey using questionnaires with simple, close-ended questions. The questions addressing potential productivity factors were formulated and validated by call center agents, with their reliability confirmed by a Cronbach's alpha value of 0.967. Table 1 presents a sample of questions for two of the predictor variables—work training and workplace relationships.

Table 1. Sample Portion of the Questionnaire

Determinants of Productivity	1	2	3	4
Work Training				
I received adequate training before the work assignment.				
The training I received improved my job performance.				
Coaching sessions improved my job performance.				
I received enough training for tools/technology used in the job.				
Workplace Relationship				
I have a supportive relationship with my immediate supervisor.				
I am comfortable asking for help from my supervisor on work-related matter				
I receive support from my supervisor during challenging situations at work.				
I am comfortable working with my co-workers.				

Legend: 1 – Strongly Disagree; 2 – Disagree; 3 – Agree; and 4 – Strongly Agree

Although the exact number varies, it is estimated that approximately 160,000 call center agents are employed in Cebu (Jobs in Philippines - Search Job Vacancies - Career | Jobstreet, n.d.). Based on this estimate, the population was set at 200,000, and a Cochran sample size calculation determined that a sample of 384 respondents was required, with a 5% margin of error and a 95% confidence level. Due to challenges in reaching potential participants, convenience sampling was used, resulting in 385 completed surveys—one more than the required minimum.

The weighted mean for each independent predictor variable and the dependent variable was calculated to assess respondents' levels of agreement or disagreement regarding the impact of predictor variables on their productivity. A series of linear regression analyses were then conducted to examine the relationship between each predictor variable and productivity. This analysis determined whether the predictor variables correlated with productivity based on the gathered data. Additionally, Analyses of Variance (ANOVA) were performed in the context of linear regression to assess whether the predictor variables significantly explained some of the variance in the dependent variable. While linear regression analysis examines the relationship between predictor variables and productivity, ANOVA complements this by evaluating whether the predictor variables explain a significant portion of the variance in the dependent variable.

Limitations and Future Research

Despite efforts to achieve an appropriate sample size, the use of convenience sampling may limit the generalizability of the findings. Based on the results, it is recommended to further investigate the underlying causes of high attrition rates and evaluate whether compensation packages align with employee needs, considering individual, social, and economic factors. Additionally, the eight predictor variables identified in this study could be applied to assess productivity in other work environments.

Results and Discussions

Potential Predictor Variables Influencing Productivity

Productivity measures performance by assessing both effectiveness and efficiency (Sena, 2020). Building on this definition, the study defines productivity as the optimal output of the workforce, in both quantity and quality, while maintaining a tolerable level of pressure. Improving productivity involves creating an environment where workers can thrive, like an ecosystem. This includes ensuring workers have the necessary aptitude for their tasks, providing training to address skill gaps, and equipping them with the right tools and technology to enhance their capabilities. Additionally, distributing workloads evenly to match workers' capacity—without causing stress—is essential. This aligns with findings from a study on human capacity zones and workload equilibrium, which defines the capacity zone as the range between two workload equilibrium points, influenced by mental capacity, efficiency, and stress limits (Zhao et al., 2023). Moreover, fostering healthy workplace relationships and maintaining favorable working conditions contribute to continuous improvement. Prioritizing workers' well-being and ensuring satisfaction with compensation helps sustain optimal productivity. The eight variables examined in this study were employee aptitude, work training, tools and technology, workload, satisfaction with compensation, employee well-being, working conditions, and workplace relationships. Figure 1 is an illustration of the relationship between all predictor variables to productivity.

Figure 1. Potential Predictor Variables Influencing Productivity

Levels of Identified Potential Predictor Variables on Productivity

Table 2. Levels of Identified Potential Predictor Variables on Productivity
n =385

	Determinants of Productivity	Means of Experience Level	Interpretation
1	Employee Aptitude	3.313	Strongly Agree
2	Work Training	3.454	Strongly Agree
3	Tools and Technology	3.377	Strongly Agree
4	Workload	3.238	Strongly Agree
5	Workplace Relationship	3.360	Strongly Agree
6	Working Conditions	3.418	Strongly Agree
7	Employee Wellbeing	3.105	Agree
8	Compensation Satisfaction	2.952	Agree
	Average	3.277	Strongly Agree

Legend: 3.26– 4.00 Strongly Agree; 2.51-3.25 Agree; 1.76 – 2.5; Disagree; and 1.00 -1.75 – Strongly Disagree.

The first four predictor variables are directly linked to the work performance of call center agents. Based on their experiences across various companies, agents rated their colleagues' aptitude with an average score of 3.313 out of 4.000, which is interpreted as "strongly agree." While this score is high, it suggests that there were still instances where coworkers were not well-suited for the job, despite the initial screening process. Similarly, regarding work training, agents gave an average rating of 3.454 out of 4.000, also interpreted as "strongly agree." This highest score among the predictor variables indicates that while training is prevalent and generally effective, there remains room for improvement. Additionally, agents rated the tools and technology provided for their jobs with an average score of 3.377 out of 4.000, signaling strong agreement that these resources are commonly

available, though not perfect. Lastly, agents rated their workloads with an average score of 3.238 out of 4.000, a lower score suggesting instances of feeling overburdened. This variable received the lowest rating among those affecting job performance, indicating that while work overload occurs, it is relatively infrequent.

The second set of four predictor variables indirectly links to the work performance of call center agents, focusing primarily on non-tangible enhancements. Based on their experiences across various companies, agents rated work relationships with an average score of 3.360 out of 4.000, interpreted as "strongly agree." While this score is high, it suggests that there is still room for improvement in this area. Similarly, agents rated their working conditions with an average score of 3.418 out of 4.000, also interpreted as "strongly agree." This score, the highest among the second set of predictor variables, indicates that agents are generally satisfied with their working conditions, though there is still room for improvement. Regarding employee well-being, agents gave an average rating of 3.105 out of 4.000, interpreted as "agree." This relatively lower score, the second lowest among all eight variables, highlights the need for more attention to employee well-being. Finally, satisfaction with compensation received an average score of 2.952 out of 4.000, also interpreted as "agree." This is the lowest rating among all eight variables, underscoring that compensation satisfaction is a significant concern for call center agents.

An average compensation satisfaction rating of 2.952 indicates that many call center agents are dissatisfied with their pay, finding it insufficient to meet both personal and family needs. This gap between compensation and employees' needs is influenced by various factors, including the agents' lifestyles, the rising cost of living in Cebu City, and the common extended family structure, which often brings additional financial responsibilities. Together, these personal, social, and economic factors contribute to the perceived disparity between compensation and necessity. Additionally, an average employee well-being rating of 3.105 suggests that many call center agents feel they lack sufficient rest to recover from their workloads, experience limited break times during shifts, and struggle to achieve a healthy work-life balance. A closer look reveals a high attrition rate among call center agents, forcing organizations to continually hire and train new employees. During these transition periods, when fewer agents must handle full workloads and new trainees require assistance, issues such as frequent overtime, limited breaks, and a lack of work-life balance can become widespread.

Level of Experience of Call Center Agents on Productivity

Table 3. Level of Experience of Call Center Agents on Productivity
n =385

	Level of Experience	Interpretation
Productivity	3.277	Strongly Agree

Legend: 3.26– 4.00 Strongly Agree; 2.51-3.25 Agree; 1.76 – 2.5; Disagree; and 1.00 -1.75 – Strongly Disagree.

Productivity serves as the outcome variable in this study. Based on their experiences across various companies, call center agents rated their productivity with an average score of 3.277 out of 4.000, interpreted as "strongly agree." This rating reflects the influence of the predictor variables on productivity. While the score is high, it suggests that there is still room for improvement, indicating that productivity could be further enhanced with improvements in the predictor variables.

Relationship between Predictor Variables and Productivity of Call Center Agents

Relationship between Employees' Aptitude and Productivity through Linear Regression

Table 4. Tabulated Data on the Relationship between Employees' Aptitude and Productivity through Linear Regression

n =385

	Coeff	SE	t-stat	lower $t_{0.025}(383)$	upper $t_{0.975}(383)$	Stand Coeff	p-value	VIF
b	1.377558	0.129855	10.608402	1.122239	1.632877	0	5.55112e-16	
Employees' Aptitude	0.573144	0.0384949	14.888825	0.497456	0.648832	0.605478	1.11022e-16	1

The intercept coefficient (*b*) is 1.3776, representing the expected level of "productivity" when "employees' aptitude" is zero. This serves as the baseline for the outcome variable. The coefficient for "employees' aptitude" is 0.5731, meaning that for each additional unit of "employees' aptitude," "productivity" is expected to increase by approximately 0.5731 units, assuming all other factors remain constant. This positive coefficient indicates a direct relationship between "employees' aptitude" and "productivity." The standard error for the intercept (*b*) is 0.1299, suggesting a reasonable level of precision in estimating the intercept. For "employees' aptitude," the standard error is 0.0385, which is relatively low, indicating that its coefficient is estimated with high precision. The t-statistic for the intercept (*b*) is 10.608, a high value suggesting the intercept is statistically significant and likely different from zero. Similarly, the t-statistic for "employees' aptitude" is 14.889, indicating a strong, statistically significant effect of "employees' aptitude" on "productivity."

The 95% confidence interval for the intercept (*b*) ranges from 1.1222 to 1.6329. This range means we can be 95% confident that the true value of the intercept lies within this interval. Similarly, the 95% confidence interval for "employees' aptitude" is between 0.4975 and 0.6488, suggesting that the true effect of "employees' aptitude" on "productivity" falls within this range with high confidence. Additionally, the standardized coefficient for "employees' aptitude" is 0.6055, indicating that it has a moderately strong influence on the dependent variable. The p-value for the intercept is 5.55e-16 (approximately zero), demonstrating that the intercept is statistically significant. Likewise, the p-value for "employees' aptitude" is 1.11e-16 (effectively zero), indicating a statistically significant relationship between this predictor variable and the dependent variable. Furthermore, the Variance Inflation Factor (VIF) for "employees' aptitude" is 1, which suggests no multicollinearity issues in this model. Since VIF values above 5 may indicate problematic multicollinearity, a VIF of 1 confirms that "employees' aptitude" is not correlated with other predictors. This is expected, as only a single predictor is included in the model, with all other variables assumed to be constant.

Relationship between Work Training and Productivity through Linear Regression

Table 5. Tabulated Data on the Relationship between Work Training and Productivity through Linear Regression

n =385

	Coeff	SE	t-stat	lower $t_{0.025}(383)$	upper $t_{0.975}(383)$	Stand Coeff	p-value	VIF
b	1.207405	0.144152	8.375913	0.923976	1.490833	0	1.55431e-15	
Work Training	0.599097	0.0411261	14.567318	0.518236	0.679958	0.597098	-2.22045e-16	1

The intercept *b* coefficient is 1.2074, representing the expected "productivity" level when the "work training" level is zero. This serves as the baseline for the outcome variable. The

coefficient for "work training" is 0.5991, meaning that for each additional unit of "work training," "productivity" is expected to increase by approximately 0.5991 units, assuming all other factors remain constant. This positive coefficient indicates a direct relationship between "work training" and "productivity." Furthermore, the standard error for the intercept *b* is 0.1441, suggesting a reasonable level of precision in estimating the intercept. The standard error for "work training" is 0.0411, which is relatively low, indicating that the coefficient for this predictor variable is estimated with high precision. The t-statistic for the intercept *b* is 8.3759, a high value, suggesting that the intercept is statistically significant and likely different from zero. Similarly, the t-statistic for "work training" is 14.5673, indicating a strong, statistically significant effect of "work training" on "productivity."

The 95% confidence interval for the intercept *b* is between 0.9240 and 1.4908. This range means we can be 95% confident that the true value of the intercept lies within this interval. The 95% confidence interval for "work training" is between 0.5182 and 0.6800, indicating that the true effect of "work training" on "productivity" lies within this range with high confidence. Additionally, the standardized coefficient for "work training" is 0.5971, implying that it has a moderately strong influence on the dependent variable. The p-value for the intercept is 1.55431e-15 (approximately zero), indicating that the intercept is statistically significant. Similarly, the p-value for "work training" is -2.22045e-16 (effectively zero), demonstrating a statistically significant relationship between "work training" and "productivity." Lastly, the Variance Inflation Factor (VIF) for "work training" is 1, which was expected since only a single predictor variable was included in the model, assuming other variables are held constant. This VIF value confirms there are no multicollinearity issues in this model.

Relationship between Tools/Technology and Productivity through Linear Regression

Table 6. Tabulated Data on the Relationship between Tools/Technology and Productivity through Linear Regression

n =385

	Coeff	**SE**	**t-stat**	**lower $t_{0.025}(383)$**	**upper $t_{0.975}(383)$**	**Stand Coeff**	**p-value**	**VIF**
b	0.92092	0.115496	7.973634	0.693835	1.148005	0	1.77636e-14	
Tools/ Technology	0.697473	0.0336254	20.742436	0.631359	0.763586	0.727358	0.0000	1

The intercept *b* coefficient is 0.9209, representing the expected level of "productivity" when the level of "tools/technology" is zero. This serves as the baseline for the outcome variable. The coefficient for "tools/technology" is 0.6975, meaning that for each additional unit of "tools/technology," "productivity" is expected to increase by approximately 0.6975 units, assuming all other factors remain constant. This positive coefficient indicates a direct relationship between "tools/technology" and "productivity." The standard error for the intercept *b* is 0.1155, suggesting a reasonable level of precision in estimating the intercept. For "tools/technology," the standard error is 0.0336, which is relatively low, indicating that its coefficient is estimated with high precision. The t-statistic for the intercept *b* is 7.9736, a high value, suggesting that the intercept is statistically significant and likely different from zero. Similarly, the t-statistic for "tools/technology" is 20.7424, which is much higher, indicating a strong and statistically significant effect of "tools/technology" on "productivity."

The 95% confidence interval for the intercept *b* is between 0.6938 and 1.1480. This range indicates that we can be 95% confident that the true value of the intercept lies within this interval. The 95% confidence interval for "tools/technology" is between 0.6314 and 0.7636, suggesting that the true effect of "tools/technology" on "productivity" lies within this range with high confidence. The standardized coefficient for "tools/technology"

is 0.7274, which implies that "tools/technology" has a strong influence on "productivity." The p-value for the intercept is 1.77636e-14 (effectively zero), confirming that the intercept is statistically significant. Similarly, the p-value for "tools/technology" is 0.0000, indicating a statistically significant relationship between this predictor variable and the dependent variable. Additionally, the Variance Inflation Factor (VIF) for "tools/technology" is 1, which was expected since only a single predictor was included in the calculation while assuming other variables to be constant. This indicates that there are no multicollinearity issues with this predictor.

Relationship between Workload and Productivity through Linear Regression

Table 7. Tabulated Data on the Relationship between Workload and Productivity through Linear Regression

n =385

	Coeff	**SE**	**t-stat**	**lower $t_{0.025}(383)$**	**upper $t_{0.975}(383)$**	**Stand Coeff**	**p-value**	**VIF**
b	1.115943	0.107686	10.362956	0.904214	1.327673	0	3.33067e-16	
Workload	0.667267	0.032601	20.463493	0.603155	0.73138	0.722702	3.33067e-16	1

The intercept *b* coefficient is 1.1159, representing the expected "productivity" level when "workload" is zero. This serves as the baseline for the outcome variable. The coefficient for this variable is 0.6673, indicating that for each additional unit of "workload," "productivity" is expected to increase by approximately 0.6673 units, assuming all other factors remain constant. This positive coefficient suggests a direct relationship between "workload" and "productivity." Furthermore, the standard error for the intercept *b* is 0.1077, suggesting a reasonable level of precision in estimating the intercept. The standard error for "workload" is 0.0326, which is quite low, indicating that its coefficient is estimated with high precision. Moreover, the t-statistic for the intercept *b* is 10.3630, a high value that suggests the intercept is statistically significant and likely different from zero. Similarly, the t-statistic for "workload" is 20.4635, indicating a strong, statistically significant effect of "workload" on "productivity."

The 95% confidence interval for the intercept *b* is between 0.9042 and 1.3277, meaning we can be 95% confident that the true value of the intercept lies within this range. The 95% confidence interval for "workload" is between 0.6032 and 0.7314, indicating that the true effect of "workload" on "productivity" falls within this range with high confidence. Additionally, the standardized coefficient for "workload" is 0.7227, which implies a strong influence on the dependent variable. The p-value for the intercept is 3.33067e-16 (approximately zero), demonstrating that the intercept is statistically significant. Similarly, the p-value for "workload" is also 3.33067e-16, indicating a statistically significant relationship between the predictor variable and "productivity." The Variance Inflation Factor (VIF) for "workload" is 1, which is expected since only a single predictor is included in the model, assuming other variables are constant. This confirms there are no multicollinearity issues.

Relationship between Workplace Relationship and Productivity through Linear Regression

Table 8. Tabulated Data on the Relationship between Workplace Relationship and Productivity through Linear Regression

n =385

	Coeff	**SE**	**t-stat**	**lower $t_{0.025}(383)$**	**upper $t_{0.975}(383)$**	**Stand Coeff**	**p-value**	**VIF**
b	1.625078	0.143457	11.327964	1.343015	1.90714	0	0.0000	
Workplace Relationship	0.491475	0.0419689	11.71044	0.408956	0.573993	0.51347	6.66134e-16	1

The intercept *b* coefficient is 1.6251, representing the expected "productivity" level when the "workplace relationship" level is zero. This serves as the baseline for the outcome variable. The coefficient for "workplace relationship" is 0.4915, indicating that for each additional unit of "workplace relationship," "productivity" is expected to increase by approximately 0.4915 units, assuming all other factors remain constant. This positive coefficient suggests a direct relationship between "workplace relationship" and "productivity." Furthermore, the standard error for the intercept *b* is 0.1435, indicating a reasonable level of precision in estimating the intercept. For "workplace relationship," the standard error is 0.04197, which is relatively low, indicating high precision in estimating its coefficient. The t-statistic for the intercept *b* is 11.3279, which is significantly high, suggesting that the intercept is statistically significant and likely different from zero. Similarly, the t-statistic for "workplace relationship" is 11.7104, showing a strong, statistically significant effect of "workplace relationship" on "productivity."

The 95% confidence interval for intercept *b* is between 1.3430 and 1.9071. This range means we can be 95% confident that the true value of the intercept lies within this interval. The 95% confidence interval for "workplace relationship" is between 0.4090 and 0.5740, indicating that the true effect of "workplace relationship" on "productivity" lies within this range with high confidence. Additionally, the standardized coefficient for "workplace relationship" is 0.5135, suggesting that it has a moderate to strong influence on the dependent variable. The p-value for the intercept is 0.0000, indicating that the intercept is statistically significant. Similarly, the p-value for "workplace relationship" is 6.66134e-16, which is effectively zero, signifying a statistically significant relationship between the predictor variable and the dependent variable. The Variance Inflation Factor (VIF) for "workplace relationship" is 1, which was expected since only a single predictor variable was included in the model, assuming other factors to be constant. This VIF indicates no issues with multicollinearity in the model.

Relationship between Working Conditions and Productivity through Linear Regression

Table 9. Tabulated Data on the Relationship between Working Conditions and Productivity through Linear Regression

n =385

	Coeff	SE	t-stat	lower $t_{0.025}(383)$	upper $t_{0.975}(383)$	Stand Coeff	p-value	VIF
b	1.271097	0.126422	10.054428	1.02253	1.519664	0	3.33067e-16	
Working Conditions	0.586723	0.0363343	16.147913	0.515283	0.658162	0.636438	0.0000	1

The intercept *b* coefficient of 1.2711 represents the expected "productivity" level when "working conditions" is zero, serving as the baseline for the outcome variable. The coefficient for this variable is 0.5867, meaning that for each additional unit of improvement in "working conditions," "productivity" is expected to increase by approximately 0.5867 units, assuming all other factors remain constant. This positive coefficient suggests a direct relationship between "working conditions" and "productivity." The standard error for the intercept *b* is 0.1264, indicating a reasonable level of precision in estimating the intercept. The standard error for "working conditions" is 0.0363, which is quite low and suggests that the coefficient for "working conditions" is estimated with high precision. The t-statistic for the intercept *b* is 10.0544, a high value that suggests the intercept is statistically significant and likely different from zero. The t-statistic for "working conditions" is 16.1479, indicating a strong and statistically significant effect of "working conditions" on "productivity."

The 95% confidence interval for the intercept *b* is between 1.0225 and 1.5197, which means we can be 95% confident that the true value of the intercept lies within this range. For

the predictor "working conditions," the 95% confidence interval is between 0.5153 and 0.6582, suggesting that the true effect of "working conditions" on "productivity" lies within this range with high confidence. The standardized coefficient for "working conditions" is 0.6364, indicating that it has a moderate to strong influence on "productivity." The p-value for the intercept is 3.33067e-16, showing that the intercept is statistically significant. Similarly, the p-value for "working conditions" is 0.0000, demonstrating a statistically significant relationship between the predictor variable and the dependent variable. The Variance Inflation Factor (VIF) for "working conditions" is 1, which is expected in this model since only a single predictor is included and other variables are assumed to be constant. A VIF of 1 confirms that there are no multicollinearity issues.

Relationship between Employee Wellbeing and Productivity through Linear Regression

Table 10. Tabulated Data on the Relationship between Employee Wellbeing and Productivity through Linear Regression

n =385

	Coeff	SE	t-stat	lower $t_{0.025}(383)$	upper $t_{0.975}(383)$	Stand Coeff	p-value	VIF
b	1.78352	0.107488	16.592705	1.572179	1.994861	0	-2.22045e-16	
Employee Wellbeing	0.480906	0.0336915	14.273809	0.414662	0.547149	0.589273	1.11022e-16	1

The intercept b coefficient of 1.7835 represents the expected level of "productivity" when "employee wellbeing" is zero, serving as the baseline for the outcome variable. The coefficient for "employee wellbeing" is 0.4809 which indicates that for each additional unit of "employee wellbeing," "productivity" is expected to increase by approximately 0.4809 units, assuming all other factors remain constant. This positive coefficient signifies a direct relationship between "employee wellbeing" and "productivity." The standard error for the intercept is 0.10749 which suggests a reasonable level of precision in estimating the intercept, while the standard error for "employee wellbeing" (0.03369) is relatively low, indicating a highly precise estimate of its effect. Moreover, the t-statistic for the intercept (16.5927) suggests that it is statistically significant, meaning it is very likely different from zero. Likewise, the t-statistic for "employee wellbeing" (14.2738) indicates a strong, statistically significant effect of "employee wellbeing" on "productivity."

The 95% confidence interval for the intercept (*b*) ranges from 1.5722 to 1.9949, meaning we can be 95% confident that the true value of the intercept falls within this interval. For the predictor "employee wellbeing," the 95% confidence interval is between 0.4147 and 0.5471, indicating that the true effect of "employee wellbeing" on "productivity" is likely to lie within this range. The standardized coefficient for "employee wellbeing" is 0.5893, suggesting a moderate to strong influence on "productivity." The p-value for the intercept is -2.22045e-16, which confirms that the intercept is statistically significant. Similarly, the p-value for "employee wellbeing" is 1.11022e-16, indicating a statistically significant relationship between this predictor and "productivity." Additionally, the Variance Inflation Factor (VIF) for "employee wellbeing" is 1, which is expected, as only a single predictor was included in the model, assuming all other variables remain constant.

Relationship between Satisfaction with Compensation and Productivity through Linear Regression

Table 11. Tabulated Data on the Relationship between Satisfaction with Compensation and Productivity through Linear Regression

n =385

	Coeff	SE	t-stat	lower $t_{0.025}(383)$	upper $t_{0.975}(383)$	Stand Coeff	p-value	VIF
b	2.259923	0.098237	23.004812	2.066772	2.453075	0	1.11022e-16	
Satisfaction with Compensation	0.34447	0.032019	10.758307	0.281515	0.407425	0.481733	3.33067e-16	1

The intercept (*b*) coefficient is 2.2599, representing the expected level of "productivity" when "satisfaction with compensation" is zero, serving as the baseline for the outcome variable. The coefficient for this variable is 0.3445, meaning that for each additional unit of this predictor, "productivity" is expected to increase by approximately 0.3445 units, assuming all other factors remain constant. This positive coefficient indicates a direct relationship between "satisfaction with compensation" and "productivity." The standard error for the intercept is 0.0982, suggesting a reasonable level of precision in estimating the intercept. For "satisfaction with compensation," the standard error is 0.0320, indicating a high level of precision in estimating its coefficient. Moreover, the t-statistic for the intercept is 23.0048, a high value suggesting that the intercept is statistically significant and likely different from zero. Similarly, the t-statistic for "satisfaction with compensation" is 10.7583, indicating a strong, statistically significant effect of this predictor on "productivity."

The 95% confidence interval for the intercept (*b*) ranges from 2.0668 to 2.4531, indicating that we can be 95% confident that the true value of the intercept falls within this interval. The 95% confidence interval for "satisfaction with compensation" ranges from 0.2815 to 0.4074, suggesting with high confidence that the true effect of "satisfaction with compensation" on "productivity" lies within this range. Additionally, the standardized coefficient for "satisfaction with compensation" is 0.4817, implying a moderate influence on the dependent variable. The p-value for the intercept is 1.11022e-16, confirming that the intercept is statistically significant. Similarly, the p-value for "satisfaction with compensation" is 3.33067e-16, indicating a statistically significant relationship between this predictor and "productivity." The Variance Inflation Factor (VIF) for "satisfaction with compensation" is 1, which is expected, as only a single predictor is included in the analysis, assuming other variables remain constant.

Summary of Regression Analysis on the Relationship between Predictor Variables and Productivity of Call Center Agents

Table 12. Summary of Regression Analysis on the Relationship between Predictor Variables and Productivity of Call Center Agents

n = 385

	Coefficient		Standard Error		t-statistic		Standard Coefficient		p-value	
Predictor Variables (PV)	b	PV	b	PV	b	PV	b	PV	b	PV
1. Workers' Aptitude	1.378	0.573	0.130	0.038	10.61	14.88	0	0.605	5.55e-16	1.11e-16
2. Work Training	1.207	0.599	0.144	0.041	8.376	14.57	0	0.597	1.55e-15	-2.2e-16
3. Tools/Technology	0.921	**0.697**	0.115	0.034	7.974	20.74	0	**0.727**	1.78e-14	0.0000
4. Workload	1.116	**0.667**	0.108	0.033	10.36	20.46	0	**0.723**	3.33e-16	3.33e-16
5. Workplace Relationship	1.625	0.491	0.143	0.042	11.33	11.71	0	0.513	0.0000	6.66e-16

	Coefficient		Standard Error		t-statistic		Standard Coefficient		p-value	
6. Working Condition	1.271	0.587	0.126	0.036	10.05	16.15	0	0.636	3.33e-16	0.0000
7. Employee Wellbeing	1.783	0.481	0.107	0.034	16.59	14.27	0	0.589	-2.2e-16	1.11e-16
8. Compensation Satisfaction	2.260	**0.344**	0.098	0.032	23.00	10.76	0	**0.482**	1.11e-16	3.33e-16

A series of simple linear regression analyses were conducted to examine the impact of workers' aptitude, work training, tools and technology, workload, workplace relationships, working conditions, employee wellbeing, and compensation satisfaction as predictor variables on productivity, the outcome variable. The results of these analyses are summarized in Table 12. The intercept (*b*) coefficients for all predictor variables range from 0.921 to 2.260, representing the expected level of productivity when the specific predictor variable is at zero. These values serve as baselines for the outcome variable. The coefficients for the predictor variables range from 0.344 to 0.697, meaning that for each additional unit increase in a predictor variable, productivity is expected to increase by approximately the same amount, assuming all other factors remain constant. These positive coefficients indicate a direct relationship between each predictor and productivity. Specifically, "tools/technology" and "workload" are the strongest predictors of productivity, with coefficients of 0.697 and 0.667, respectively, while "compensation satisfaction," with a coefficient of 0.344, is the weakest predictor of productivity in the context of this study.

Furthermore, the standard errors for the intercept (*b*) range from 0.098 to 0.144, indicating a reasonable level of precision in estimating the intercept. For the predictor variables, the standard errors range from 0.032 to 0.042, which are relatively low, suggesting that the coefficients are estimated with high precision. Additionally, the t-statistics for the intercepts range from 7.974 to 23.00, all of which are high values, suggesting that the intercepts are statistically significant and significantly different from zero. Similarly, the t-statistics for the predictor variables range from 10.76 to 20.74, indicating strong, statistically significant effects of the predictor variables on productivity.

Additionally, the standardized coefficients for the predictor variables range from 0.482 to 0.727, indicating that these variables have a moderate to strong influence on the dependent variable, productivity. Specifically, "tools/technology" and "workload," with standardized coefficients of 0.727 and 0.723, respectively, emerge as the strongest predictors of productivity, while "compensation satisfaction," with a standardized coefficient of 0.344, is the weakest predictor in the study. It is important to note that these findings hold true for both unstandardized and standardized coefficients. Furthermore, all p-values for both the intercepts and predictor variables are effectively zero, confirming statistically significant relationships between each predictor variable and productivity.

Test whether the Predictor Variables Significantly Explain some of the Variance in the Dependent Variable

Table 13. ANOVA (Analysis of Variance) Summary for Regression Analyses on whether the Predictor Variables Significantly Explain some of the Variance in the Dependent Variable

n = 385

Predictor Variables	Source	DF	SS	MS	F (1,383)	p
1. Workers'	Regression	1	50.336	50.336	223.608	0.000
Aptitude	Residual	383	86.217	0.225		
	Total	384	136.553	0.356		
2. Work Training	Regression	1	48.702	48.702	212.324	0.000
	Residual	383	87.851	0.229		
	Total	384	136.553	0.356		

Predictor Variables	Source	DF	SS	MS	F (1,383)	p
3. Tools and	Regression	1	73.096	73.096	430.249	0.000
Technology	Residual	383	65.069	0.170		
	Total	384	138.165	0.360		
4. Workload	Regression	1	71.125	71.125	416.348	0.000
	Residual	383	65.428	0.171		
	Total	384	136.553	0.356		
5. Workplace	Regression	1	36.343	36.343	138.902	0.000
Relationship	Residual	383	100.21	0.262		
	Total	384	136.553	0.356		
6. Working	Regression	1	55.964	55.964	260.755	0.000
Conditions	Residual	383	82.201	0.215		
	Total	384	138.165	0.360		
7. Employee	Regression	1	47.233	47.233	202.531	0.000
Wellbeing	Residual	383	89.320	0.233		
	Total	384	136.553	0.356		
8. Compensation	Regression	1	32.063	32.063	115.741	0.000
Satisfaction	Residual	383	106.101	0.277		
	Total	384	138.165	0.360		

A series of ANOVA tests were conducted to evaluate the effect of workers' aptitude, work training, tools and technology, workload, workplace relationship, working conditions, employee wellbeing, and compensation satisfaction as predictor variables on productivity, the outcome variable. Table 4 summarizes the ANOVA results for these analyses. For the first predictor variable, workers' aptitude, the regression model was significant with F (1, 383) = 223.608 and p = 0.000 which is below 0.05 level of significance, indicating that workers' aptitude accounted for a substantial portion of the variance in productivity. Similarly, in work training, the regression model was significant with F (1, 383) = 212.324 and p = 0.000 which is below the 0.05 level of significance, indicating that workers' aptitude accounted for a substantial portion of the variance in productivity. Furthermore, in tools and technology, the regression model was significant with F (1, 383) = 430.249 and p = 0.000 which is below the 0.05 level of significance, indicating that workers' aptitude accounted for a substantial portion of the variance in productivity. Moreover, in workload, the regression model was significant with F (1, 383) = 416.348 and p = 0.000 which is below the 0.05 level of significance, indicating that workers' aptitude accounted for a substantial portion of the variance in productivity. Additionally, in workplace relationships, the regression model was significant with F (1, 383) = 138.902 and p = 0.000 which is below the 0.05 level of significance, indicating that workers' aptitude accounted for a substantial portion of the variance in productivity. Likewise, in working conditions, the regression model was significant with F (1, 383) = 260.755 and p = 0.000 which is below the 0.05 level of significance, indicating that workers' aptitude accounted for a substantial portion of the variance in productivity. In employee wellbeing, the regression model was significant with F (1, 383) = 202.531 and p = 0.000 which is below the 0.05 level of significance, indicating that workers' aptitude accounted for a substantial portion of the variance in productivity. Finally, in working conditions, the regression model was significant with F (1, 383) = 115.741 and p = 0.000 which is below the 0.05 level of significance, indicating that workers' aptitude accounted for a substantial portion of the variance in productivity.

Implications of the Identified Potential Predictor Variables and Productivity

Based on a series of simple linear regression analyses examining the impact of workers' aptitude, work training, tools and technology, workload, workplace relationships, working

conditions, employee well-being, and compensation satisfaction on productivity, the results demonstrated that all predictor variables are significantly related to productivity. The ANOVA results further revealed that these predictors explain a substantial portion of the variance in productivity. Additionally, existing research supports the notion that these variables can positively influence employee productivity. Therefore, organizations should consider implementing strategies that target improvements in all these areas to enhance overall productivity.

Based on the responses of 385 call center agents, all predictor variables received strong agreement, except employee well-being and compensation satisfaction. This indicates that call center agents generally have a positive outlook on workers' aptitude, work training, tools and technology, workload, workplace relationships, and working conditions. However, there are some concerns regarding employee well-being and compensation satisfaction. Further analysis of the respondents' answers revealed that some agents feel overworked and dissatisfied with their compensation, which contributed to lower ratings in these areas. This data suggests that business outsourcing companies may consider focusing on initiatives to improve employee well-being and compensation satisfaction to address these concerns.

Conclusions

Based on the findings of the study, the following conclusions were drawn. All eight identified predictor variables for productivity received a collective score of 3.277 out of a possible 4.000 from call center agents. These variables were all found to be significant predictors of productivity, with each contributing to the explanation of variance in the dependent variable. Given the results, it is crucial to enhance the implementation of activities and policies related to all eight predictors, as they all have a significant impact on productivity. However, employee well-being, one of the two lowest-rated predictors, requires urgent attention, particularly in addressing high attrition rates and workload distribution. Satisfaction with compensation, the lowest-rated predictor, also demands immediate action. Organizations should consider designing compensation packages that better align with the individual, social, and economic conditions of the local context.

Recommendations

Based on the conclusions, the following recommendations were made. Call center management should closely monitor activities and policies related to workers' aptitude, work training, tools and technology, workload, workplace relationships, working conditions, employee well-being, and compensation satisfaction, as these factors significantly influence employee productivity. Special attention should be given to employee well-being and satisfaction with compensation, as these two predictors received the lowest ratings. Additionally, it is recommended that future researchers replicate this study in different organizational contexts to further explore the generalizability of these findings.

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