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Determinants of Employee Productivity Among Selected Private Tertiary Education in Laoag City

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ABSTRACT

Employee productivity is central to organizational effectiveness, particularly in tertiary education institutions where teaching and non-teaching personnel contribute directly to institutional operations and service delivery. This study examined the factors associated with employee productivity among five selected private tertiary education institutions in Laoag City. It specifically assessed human, system, environmental, and health factors; determined the level of work productivity; examined the relationships between these factors and work productivity; assessed the moderating role of demographic profile; and identified demographic characteristics associated with productivity. A descriptive-correlational survey design was employed with 173 respondents selected through simple random sampling from a population of 312 employees. Data were collected through an adapted and modified questionnaire administered using Google Forms. The instrument demonstrated excellent internal consistency, with Cronbach's alpha coefficients of .954 for the productivity factors and .945 for work productivity indicators. Frequencies, percentages, weighted means, Pearson correlation, moderation analysis, and linear regression were used in the analysis. The findings showed that human, system, environmental, and health factors were positively and significantly related to work productivity, with health factors showing the strongest correlation ($r = .902$, $p < .001$). The respondents reported a high level of work productivity ($M = 3.54$). The interaction between the main productivity factors and demographic profile was not statistically significant ($p = .463$), indicating no evidence of moderation. Using the study's stated .01 significance criterion, educational attainment was the only demographic characteristic that significantly predicted work productivity ($p < .001$). The findings underscore the importance of employee well-being, supportive systems, conducive work environments, and health-related initiatives in strengthening productivity in private tertiary education institutions.

Keywords: employee productivity, employee well-being, work environment, human capital, higher education, educational attainment, tenure, workplace health

INTRODUCTION

Employee productivity is an important indicator of organizational effectiveness because it reflects how efficiently employees translate available resources, competencies, and working conditions into desired outputs. Productivity is closely associated with organizational competitiveness, economic performance, and the capacity of institutions to provide reliable and high-quality services. Existing literature identifies organizational practices, technology, employee capabilities, training, and working conditions as relevant influences on productivity (Goldin et al., 2019; Pasban & Nojedeh, 2016; Chhetri et al., 2018).

In higher education, productivity has a distinct institutional significance. Universities and other tertiary education institutions rely on both teaching and non-teaching personnel to sustain instruction, administration, student services, research, and other institutional functions. The quality of human resources therefore contributes substantially to institutional performance. Employee productivity may be shaped not only by individual competence and motivation but also by organizational systems and the physical and health conditions within which work is performed (Markos & Sandhya Sridevi, 2010; Abdelwahed & Al Doghan, 2023).

Employee characteristics may also be relevant to productivity. Previous studies have considered age, sex, marital status, educational attainment, and length of service as demographic characteristics that may be associated with employee performance and organizational outcomes (Hassan & Ogunkoya, 2014; Hendrawijaya, 2019; Kampelmann et al., 2018). Education is particularly relevant within a human-capital perspective because knowledge and skills acquired through education may enhance an individual's capacity to perform work effectively. Similarly, tenure may represent accumulated organizational experience and familiarity with institutional processes (Ng & Feldman, 2013).

Working conditions are likewise important. Employee well-being, indoor environmental quality, noise, temperature, lighting, ventilation, and other workplace conditions have been linked in previous studies to comfort, health, concentration, and productivity (Mujan et al., 2019; Khoshbakht et al., 2020; Kakoulli et al., 2022). Health conditions can also constrain work capacity, making employee health an important consideration in productivity management (Fouad et al., 2017; de Oliveira et al., 2022).

Despite the established literature on employee productivity, there remains a practical need to examine how these factors operate within the specific context of private tertiary education institutions in Laoag City. Employees in these institutions perform different roles and work under varying organizational, environmental, and personal conditions. Understanding the factors associated with their productivity can provide institution-level evidence for management decisions concerning employee support, workplace improvement, and professional development.

Against this background, the present study examined employee productivity among five selected private tertiary education institutions in Laoag City. It focused on four groups of productivity-related factors—human, system, environmental, and health factors—and considered demographic profile as a potential moderator and predictor of work productivity. The study is anchored in Human Capital Theory, which views employees' knowledge, skills, experience, and related capabilities as forms of capital that contribute to organizational productivity.

Research Problem

The study sought to determine the factors associated with employee productivity among the five selected private tertiary education institutions in Laoag City. Specifically, it addressed the following questions:

1. What are the factors associated with employee productivity in terms of human, system, environmental, and health factors?
2. What is the level of employee work productivity?
3. Is there a significant relationship between human, system, environmental, and health factors and work productivity?
4. Does demographic profile significantly moderate the relationship between the main productivity factors and work productivity?
5. Which demographic characteristics significantly predict work productivity?

Research Hypothesis

The study hypothesized that the main factors influencing productivity are positively associated with employee work productivity.

Conceptual or Theoretical Framework

The study is anchored in Human Capital Theory, which explains productivity in terms of the knowledge, skills, competencies, experience, and other productive capacities embodied in people. Within this perspective, education and work experience represent important forms of human capital that may contribute to employees' ability to perform effectively. The framework is extended in the present study by considering human, system, environmental, and health factors as workplace conditions associated with the application of employee capabilities.

The conceptual framework positions human, system, environmental, and health factors as the main explanatory variables and work productivity as the outcome variable. Department, age, sex, marital status, educational attainment, and tenure comprise the demographic profile examined as a potential moderator and as a set of possible predictors of work productivity.

METHODOLOGY

Research Design

A descriptive-correlational survey design was used to examine the relationships among the study variables. This design was appropriate because the study described the respondents and their perceptions of productivity-related factors while statistically examining the relationships between those factors and work productivity. Moderation analysis was additionally used to determine whether demographic profile altered the relationship between the main productivity factors and work productivity.

Participants or Data Sources

The study involved employees from five selected private tertiary education institutions in Laoag City. The total population consisted of 312 teaching and non-teaching employees. A sample of 173 respondents was determined using Raosoft and selected through simple random sampling.

Research Instruments or Materials

Data were gathered using a three-part questionnaire administered through Google Forms. Part I obtained demographic information on department, age, sex, marital status, educational attainment, and tenure. Part II assessed human, system, environmental, and health factors associated with productivity. Part III measured work productivity indicators. The productivity-factor items were adopted from Croome and Kaluarachchi's (2000) work on assessment and measurement of productivity, while the work productivity indicators were adapted from Asio's study on work productivity among tertiary education employees. The researchers modified the wording of the items to fit the context of the respondents.

A pilot test involving 15 respondents was conducted. The reported Cronbach's alpha coefficients were .954 for the main productivity factors and .945 for work productivity indicators, indicating excellent internal consistency. The questionnaire was also reviewed by a statistician before its use in the study.

Data Gathering Procedure

Prior to data collection, the researchers secured approval from the Research Ethics Committee and obtained ethical clearance and permission from the participating institutions. The questionnaire was distributed electronically through Google Forms. Participation was voluntary and based on informed consent. Data were stored in password-protected electronic files, and measures were adopted to protect respondents' identities and confidentiality.

Data Analysis

Frequencies and percentages were used to summarize the demographic profile. Weighted means were used to describe the productivity-related factors and the level of work productivity. For the four-point scale, means from 3.26 to 4.00 were interpreted as Strongly Agree for the productivity-factor items and Highly Productive for the work-productivity items; 2.51–3.25 represented Agree/Productive, 1.76–2.50 represented Disagree/Slightly Productive, and 1.00–1.75 represented Strongly Disagree/Not Productive. Pearson's correlation coefficient was used to examine relationships between the main productivity factors and work productivity. SPSS version 26.0 was used for the descriptive and correlation analyses, while Jamovi was used for moderation and regression analyses. The original study specified $p < .01$ as the criterion for statistical significance; this criterion is retained in the interpretation of the regression findings. employed. Explain how the analysis aligns with the research design and objectives.

Ethical Considerations

Participation was voluntary and informed consent was obtained before data collection. Respondents were informed of the purpose of the study and their freedom to participate or decline. No monetary incentives or compensation were provided. Personal information was not disclosed in data analysis or reporting. Electronic data were password-protected, access was restricted to the researchers, and the study reported that electronic files would be deleted after one year.

RESULTS AND DISCUSSION

Table 1. Respondents' Demographic Profile

Characteristic	Category	f	%
Department	Teaching staff	115	66.47
	Non-teaching staff	58	33.53
Age	20–25	18	10.40
	26–30	14	8.09
	31–35	19	10.98
	36–40	26	15.03
	41–45	44	25.43
	46–50	35	20.23
	51–55	14	8.09
	56–60	3	1.73
	61 and above	0	0.00
Sex	Male	74	42.77

	Female	99	57.23
Marital status	Single	35	20.23
	Married	109	63.01
	Widowed	10	5.78
	Live-in	19	10.98
Educational attainment	High school graduate	19	10.98
	College graduate	96	55.49
	Master's degree holder	44	25.43
	Doctorate degree holder	14	8.09
Tenure	1–5 years	57	32.95
	6–10 years	80	46.24
	11–15 years	31	17.92
	16–20 years	3	1.73
	21 years and above	2	1.16

Teaching staff comprised the majority of respondents (66.47%). The largest age group was 41–45 years (25.43%), while females represented 57.23% of the sample. Most respondents were married (63.01%), college graduates (55.49%), and had 6–10 years of service (46.24%). These descriptive results characterize the respondent group but should not be interpreted as evidence that the most common demographic category is necessarily the most productive.

Table 2. Human Factors Associated with Productivity

Indicator	M	Interpretation
Well-being (physical and mental health)	3.86	Strongly Agree
Ability to perform	3.82	Strongly Agree
Motivation	3.80	Strongly Agree
Job satisfaction	3.80	Strongly Agree
Technical competence	3.79	Strongly Agree
Overall	3.81	Strongly Agree

Human factors received an overall mean of 3.81, indicating strong agreement that these conditions are relevant to productivity. Employee well-being obtained the highest mean (M = 3.86), followed by ability to perform (M = 3.82). The finding is consistent with the study's human-capital perspective because employees are better positioned to apply their knowledge and skills when their physical and psychological well-being is adequately supported.

Table 3. System Factors Associated with Productivity

Indicator	M	Interpretation
Indoor environment	3.82	Strongly Agree
Occupation	3.78	Strongly Agree
Organization	3.79	Strongly Agree
Personal circumstances	3.77	Strongly Agree
Facilities and services	3.75	Strongly Agree
Outdoor environment	3.70	Strongly Agree
Overall	3.77	Strongly Agree

System factors obtained an overall mean of 3.77. Indoor environment received the highest rating (M = 3.82), followed by organizational conditions (M = 3.79). This pattern is consistent with literature emphasizing indoor environmental quality, organizational arrangements, and workplace conditions as relevant to employee comfort and productivity (Mujan et al., 2019; Khoshbakht et al., 2020; Kakoulli et al., 2022).

Table 4. Environmental Factors Associated with Productivity

Indicator	M	Interpretation
Temperature	3.67	Strongly Agree
Noise	3.71	Strongly Agree
Crowded workspace	3.68	Strongly Agree
Insufficient/excessive lighting	3.55	Strongly Agree
Discomfort from sunlight	3.55	Strongly Agree
Overall	3.63	Strongly Agre

Environmental factors produced an overall mean of 3.63. Noise received the highest rating (M = 3.71), followed by crowded workspace (M = 3.68) and temperature (M = 3.67). The result supports prior work indicating that noise, thermal conditions, lighting, and workspace characteristics can affect concentration, comfort, and work performance (Arminas et al., 2021; Cahyani, 2020; Felipe Contin de Oliveira et al., 2023).

Table 5. Health Factors Associated with Productivity

Indicator	M	Interpretation
Respiratory problems	3.74	Strongly Agree
Skin problems	3.68	Strongly Agree
Nervous problems	3.68	Strongly Agree
Nasal-related problems	3.57	Strongly Agree
Odour complaints	3.52	Strongly Agree
Overall	3.64	Strongly Agree

Health factors obtained an overall mean of 3.64, with respiratory problems receiving the highest mean (M = 3.74). The findings indicate that respondents perceived health-related conditions as relevant to their ability to perform work. This is consistent with literature linking employee health and well-being to productivity and work capacity (Fouad et al., 2017; de Oliveira et al., 2022).

Table 6. Level of Work Productivity

Indicator	M	Interpretation
Quality of work improves over time	3.52	Highly Productive
Can deliver set deadlines	3.57	Highly Productive
Steadily increased output	3.52	Highly Productive
Can deliver under less than perfect conditions	3.57	Highly Productive
Reduced service cycle time over time	3.55	Highly Productive
Provides/listens to suggestions for service delivery	3.52	Highly Productive
Eager to learn new ways to be productive	3.57	Highly Productive
Increased satisfaction with quality of service	3.55	Highly Productive
Generates more than an hour's worth of productivity each hour	3.52	Highly Productive
Knows what to do and when to do it	3.55	Highly Productive
Eager to maximize productivity	3.55	Highly Productive
Identifies and prioritizes important tasks	3.52	Highly Productive
Overall	3.54	Highly Productive

The overall work productivity mean was 3.54, interpreted as Highly Productive. The highest-rated indicators were the ability to deliver work within set deadlines and under less-than-perfect conditions, as well as eagerness to learn new ways of improving productivity (all M = 3.57). The result indicates a strong self-reported orientation toward timely delivery, adaptation, and continuous improvement.

Table 7. Relationship Between Productivity Factors and Work Productivity

Factor	r	p	Interpretation

Human factors	.433	< .001	Significant positive relationship
System factors	.573	< .001	Significant positive relationship
Environmental factors	.789	< .001	Significant positive relationship
Health factors	.902	< .001	Significant positive relationship

All four productivity-factor groups were significantly and positively correlated with work productivity. The strongest association was observed for health factors ($r = .902$, $p < .001$), followed by environmental factors ($r = .789$, $p < .001$), system factors ($r = .573$, $p < .001$), and human factors ($r = .433$, $p < .001$). These results support the study hypothesis that the main productivity factors are positively associated with work productivity. Because the design is correlational, the findings should be interpreted as associations rather than proof of causal effects.

Table 8. Moderating Role of Demographic Profile

Moderation term	Estimate	SE	z	p
Main productivity factors	0.7569	0.0565	13.402	< .001
Demographic profile	-0.1004	0.0379	-2.646	0.008
Main factors × demographic profile	-0.0610	0.0830	-0.735	0.463

The main productivity factors had a significant positive association with work productivity (estimate = 0.7569, $p < .001$). Demographic profile also showed a significant main effect (estimate = -0.1004, $p = .008$). However, the interaction between the main productivity factors and demographic profile was not statistically significant (estimate = -0.0610, $p = .463$). Therefore, the study provides no statistical evidence that demographic profile moderated the relationship between the main productivity factors and work productivity. The significant simple slopes at low, average, and high levels of the demographic-profile measure show that the predictor remained associated with productivity across those levels, but they do not establish a significant moderation effect when the interaction term itself is nonsignificant.

Table 9. Demographic Predictors of Work Productivity

Predictor	Estimate	SE	t	p
Department (teaching/non-teaching)	0.11781	0.0673	1.751	0.081
Age	-0.00256	0.0214	-0.120	0.905

Sex	-0.00582	0.0544	-0.107	0.915
Marital status	-0.06555	0.0337	-1.947	0.053
Educational attainment	-0.21776	0.0481	-4.529	< .001
Tenure	0.08147	0.0389	2.092	0.037
Model R^2	0.109			

The regression model explained 10.9% of the variance in work productivity (R^2 = .109). Using the study's pre-specified significance criterion of $p < .01$, educational attainment was the only demographic predictor that reached statistical significance ($p < .001$). Department, age, sex, marital status, and tenure did not meet the .01 criterion. Tenure would be considered significant under a conventional .05 threshold ($p = .037$), but it was not significant under the criterion specified in the original methodology. This distinction should be reported explicitly to maintain consistency between the analytical plan and the interpretation of results.

The finding regarding educational attainment is consistent with the human-capital perspective and with Kampelmann et al. (2018), who examined the relationship between education, productivity, and wages. In the present study, however, the result should be interpreted as a statistical association within the sampled institutions rather than as evidence that additional education causes higher productivity.

General Discussion

Taken together, the findings indicate that employee productivity in the five selected private tertiary education institutions is associated with a combination of employee-level, organizational, environmental, and health-related conditions. All four factor groups received favorable ratings, and each demonstrated a statistically significant positive correlation with work productivity. The particularly strong correlation between health factors and work productivity suggests that employee health and well-being merit substantial attention in institutional productivity strategies.

The environmental findings further indicate that workplace conditions are relevant to employees' perceived productivity. Noise received the highest rating among environmental indicators, while indoor environment was the strongest system-related indicator. These findings are consistent with literature emphasizing the importance of indoor environmental quality, noise control, thermal comfort, and workspace conditions for employee comfort and productivity.

The demographic analysis provides a more nuanced conclusion. Although demographic profile showed a significant main effect in the moderation model, the interaction between demographic profile and the main productivity factors was not significant. Thus, demographic characteristics should not be described as changing the strength of the relationship between the main factors and work productivity. Educational attainment

was the only demographic predictor that met the study's stated .01 significance criterion in the regression model.

From the perspective of Human Capital Theory, the findings reinforce the relevance of employee capabilities and conditions that enable those capabilities to be translated into effective work. The practical implication is not simply to increase employee qualifications but also to create institutional environments in which employees can use their competencies effectively. Management attention to well-being, health, facilities, organizational systems, and workplace conditions may therefore complement professional development in supporting productivity.

REFERENCES

Abdelwahed, N. A. A., & Al Doghan, M. A. (2023). Developing employee productivity and performance through work engagement and organizational factors in an educational society. Societies, 13(3). https://doi.org/10.3390/soc13030065

Arminas, N., Nurwahidah, A., & Ahdan, M. (2021). Effect of noise and room temperature on employee productivity in mechanical maintenance workshop PT. Semen Bosowa Maros. Journal of Physics: Conference Series, 1803(1), 012026. https://doi.org/10.1088/1742-6596/1803/1/012026

Bonacini, L., Gallo, G., & Scicchitano, S. (2021). Working from home and income inequality: Risks of a 'new normal' with COVID-19. Journal of Population Economics, 34(1), 303–360. https://doi.org/10.1007/s00148-020-00800-7

Cahyani, A. A. (2020). Influence of work environment noise to productivity of employee performance of Sidoarjo District. Journal of Public Health Science Research, 1(1), 12. https://doi.org/10.30587/jphsr.v1i1.1181

Chhetri, P., Gekara, V., Manzoni, A., & Montague, A. (2018). Productivity benefits of employer-sponsored training: A study of the Australian transport and logistics industry. Education + Training, 60(9), 1009–1025. https://doi.org/10.1108/ET-02-2017-0029

Croome, D., & Kaluarachchi, Y. (2000). Assessment and measurement of productivity.

de Oliveira, C., Saka, M., Bone, L., & Jacobs, R. (2022). The role of mental health on workplace productivity: A critical review of the literature. Applied Health Economics and Health Policy. https://doi.org/10.1007/s40258-022-00761-w

Felipe Contin de Oliveira, S., Aletta, F., & Kang, J. (2023). Self-rated health implications of noise for open-plan office workers: An overview of the literature. Building Acoustics. https://doi.org/10.1177/1351010X231152841

Fouad, A. M., Waheed, A., Gamal, A., Amer, S. A., Abdellah, R. F., & Shebl, F. M. (2017). Effect of chronic diseases on work productivity: A propensity score analysis. Journal of Occupational and Environmental Medicine, 59, 480–485. https://doi.org/10.1097/JOM.0000000000000981

Gabriele, R., Tundis, E., & Zaninotto, E. (2018). Aging workforce and productivity: The unintended effects of retirement regulation in Italy. Economia Politica, 35, 163–182. https://doi.org/10.1007/s40888-017-00079-x

Goldin, I., Koutroumpis, P., Lafond, F., Rochowicz, N., & Winkler, J. (2019). Oxford Martin School Programme on Technological and Economic Change: Reconciling rapid technological change and stagnating productivity.

Hassan, B., & Ogunkoya, O. (2014). Demographic variables and job performance: Any link? A case of insurance salesmen. Acta Universitatis Danubius. Œconomica, 10(4), 19–30.

Hendrawijaya, A. (2019). Demographic factors and employee performance: The mediating effect of employee empowerment. Media Ekonomi dan Manajemen, 34.

Hoobler, J. M., Wayne, S. J., & Lemmon, G. (2009). Bosses' perceptions of family-work conflict and women's promotability: Glass-ceiling effects. Academy of Management Journal, 52, 939–957.

Kakoulli, C., Kyriacou, A., & Michaelides, M. P. (2022). A review of field measurement studies on thermal comfort, indoor air quality and virus risk. Atmosphere, 13(2), 191. https://doi.org/10.3390/atmos13020191

Kampelmann, S., Rycx, F., Saks, Y., & Tojerow, I. (2018). Does education raise productivity and wages equally? The moderating role of age and gender. IZA Journal of Labor Economics, 7(1), 1–37. https://doi.org/10.1186/s40172-017-0061-4

Khoshbakht, M., Baird, G., & Rasheed, E. O. (2020). The influence of work group size and space sharing on the perceived productivity, overall comfort and health of occupants in commercial and academic buildings. Indoor and Built Environment. https://doi.org/10.1177/1420326X20912312

Kim, Y. K., Abdou, Y., Abdou, A., & Altan, H. (2022). Indoor environmental quality assessment and occupant satisfaction: A post-occupancy evaluation of a UAE university office building. Buildings, 12(7), 986. https://doi.org/10.3390/buildings12070986

Kenny, J. (2017). Academic work and performativity. Higher Education, 74, 897–913. https://doi.org/10.1007/s10734-016-0084-y

Markos, J. M. R., & Sandhya Sridevi, M. (2010). Employee engagement: The key to improving performance. International Journal of Business and Management, 5(12), 89–96. https://doi.org/10.5539/ijbm.v5n12p89

Mujan, I., Anđelković, A. S., Munćan, V., Kljajić, M., & Ružić, D. (2019). Influence of indoor environmental quality on human health and productivity: A review. Journal of Cleaner Production, 217, 646–657. https://doi.org/10.1016/j.jclepro.2019.01.307

Ng, T. W. H., & Feldman, D. C. (2013). A meta-analysis of the relationship of age and tenure with innovation-related behavior. Journal of Occupational and Organizational Psychology, 86, 585–616.

Pasban, M., & Nojedeh, S. H. (2016). A review of the role of human capital in the organization. Procedia - Social and Behavioral Sciences, 230, 249–253. https://doi.org/10.1016/j.sbspro.2016.09.032

Qabbal, L., Younsi, Z., & Naji, H. (2022). An indoor air quality and thermal comfort appraisal in a retrofitted university building via low-cost smart sensor. Indoor and Built Environment, 31(3), 586–606. https://doi.org/10.1177/1420326X211015717

Singh, S., & Chaudhary, N. (2022). Employee productivity: An analysis of dimensions and methodology through systematic literature review. The Empirical Economics Letters, 21(4), 183–204.