ANALYZING EMPLOYEE TRAINING PROGRAMS AND THEIR IMPACT ON THE ADOPTION OF EMERGING TECHNOLOGIES IN INVESTMENT AND RISK MANAGEMENT IN PRODUCTION SECTORS

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Abstract

This study examined the relationship between employee training and the adoption of emerging technologies in investment and risk management within the production sector. Drawing on data from 200 respondents, the research underscores the critical role of training participation in driving technological innovation. Statistical analysis, including the chi-square test, confirms a significant correlation ($\chi^2 = 0.638$, $p < 0.05$) between training and technology adoption rates, validating the hypothesis. Moreover, demographic factors such as age and education level are found to influence this relationship, with age group 18-35 years notably affecting technology adoption. However, education levels show no substantial impact, highlighting the need for tailored training programs that consider generational differences. Additionally, the study emphasizes the importance of self-efficacy, revealing a statistically significant relationship ($\chi^2 = 3.238$, $p < 0.05$) between higher self-efficacy and increased technology adoption rates. These findings underscore the necessity for organizations to strategically invest in customized workforce training to foster innovation and efficiency in production sectors grappling with emerging technologies. In conclusion, this research provides actionable insights for organizations seeking to navigate technological advancements effectively, recommending adaptive training strategies that prioritize building self-efficacy and acknowledge demographic nuances.

Keywords: Demographic Factors, Investment Management, Risk Management, Technology Adoption, Workforce Training

1. INTRODUCTION

Technological advancements are fundamentally reshaping industries across the globe, driving significant changes in how organizations operate and compete. Within this rapidly evolving landscape, the adoption of emerging technologies, particularly in the context of investment and risk management in the production sector, has become increasingly important. Effective technology adoption often hinges not only on the availability of cutting-edge tools but also on the readiness of the workforce to integrate these innovations into their daily operations. In this regard, employee training programs serve as a critical factor, ensuring that the workforce is equipped with both the technical know-how and the confidence to successfully implement new technologies. The relationship between employee training programs and the adoption of emerging technologies is a multifaceted one, shaped by various factors, including the demographic characteristics of the workforce. Tailored training approaches, which account for factors such as age and education level, can significantly influence the effectiveness of these programs. Demographic nuances play a critical role in how employees engage with training content, and by extension, how effectively they integrate new technologies into their work processes. This study emphasizes the importance of considering these demographic factors when designing training programs, as overlooking them could lead to suboptimal outcomes in technology adoption.

In addition to demographic factors, the concept of self-efficacy—employees' belief in their ability to succeed—emerges as a significant variable in this equation. Research has shown that training initiatives that enhance self-efficacy can have a profound impact on employees' willingness and ability to embrace new technologies. By fostering a sense of confidence in their technological competencies, organizations can smooth the transition to new tools and systems, thereby reducing resistance to change and increasing the likelihood of successful

technology integration. This research investigates the association between employee training programs and the successful integration of emerging technologies within the production sector, guided by three core hypotheses. It explores how well-prepared employees, through participation in training programs, can significantly affect the rate of technology adoption. The study aims to contribute valuable insights into the development of training programs that not only impart technical skills but also consider individual factors such as age, education, and self-efficacy. This targeted approach is crucial for optimizing technology adoption strategies and ensuring that organizations in the production sector can fully leverage the benefits of technological innovations. By analyzing data from a diverse sample of 200 respondents, this study delves into the complexities of technology adoption facilitated by training programs. It addresses several key questions, such as whether employee participation in training programs is significantly associated with the rate of technology adoption, and whether demographic factors like age and education level moderate this relationship. Furthermore, the research investigates the role of self-efficacy, cultivated through training programs, as a predictor of technology adoption within production environments.

As industries continue to evolve in response to technological advancements, the importance of workforce readiness cannot be overstated. Employee training programs, when designed with demographic factors and self-efficacy in mind, can serve as powerful tools for enabling technology adoption. This study underscores the need for organizations to invest in comprehensive, customized training initiatives that prepare employees not just technically, but also psychologically, to navigate the complexities of technological innovation. By doing so, companies can enhance productivity, foster innovation, and maintain a competitive edge in an increasingly digital world. The significance of this study extends beyond the immediate context of the production sector. Its findings offer actionable insights for various stakeholders,

including employees, managers, IT professionals, and academic researchers. For employees, the research highlights the importance of tailored training programs that address individual needs, fostering a sense of confidence and capability in adopting new technologies. For managers, the study provides strategic recommendations for designing effective training initiatives that consider demographic factors, thus facilitating smoother technology integration. IT professionals, in turn, can benefit from a deeper understanding of the training needs of their colleagues, ensuring that technology rollouts are seamless and collaborative. Finally, the study contributes to the broader academic discourse on technology adoption and workforce development, providing a comprehensive framework for future research in this field. In conclusion, the relationship between employee training programs and technology adoption is a dynamic and complex one, influenced by a range of factors, including demographic characteristics and self-efficacy. As organizations in the production sector continue to grapple with the challenges and opportunities presented by technological advancements, the role of well-designed training programs in facilitating successful technology adoption becomes increasingly crucial. Through this research, we aim to shed light on the strategies that can help organizations optimize their training efforts and, in doing so, better position themselves to harness the full potential of emerging technologies.

2.   LITERATURE REVIEW

The adoption of emerging technologies in the production sector is heavily influenced by several factors, including employee training programs, demographic variables, and self-efficacy. This section examines existing literature on the impact of these factors on technology adoption, focusing on the relevance of structured training programs, the moderating role of demographic characteristics, and the significance of self-efficacy in facilitating technology adoption.

Training Programs and Technology Adoption

Extensive research highlights the critical role of employee training programs in enhancing technology adoption across various industries. Structured training provides employees with the necessary skills and knowledge to integrate new technologies effectively into their work processes. According to Bharath et al. (2023), training initiatives are pivotal in increasing employee competence and confidence, particularly in technology-driven sectors. Their study on agricultural production in India underscores the importance of comprehensive training in improving technology adoption rates among participants. Batool et al. (2021) also emphasize the importance of training for the development of employees, suggesting that training tailored to technological advancements can bridge knowledge gaps and increase employee readiness to adopt new technologies. This perspective aligns with findings from other studies, which indicate that training programs must be carefully designed to address specific technology-related challenges within the production sector (Ciepluch & Eisenbeis, 2022). These programs help mitigate barriers to adoption, particularly in environments where technological changes are rapid and continuous. The positive impact of training on technology adoption is further supported by Grove et al. (2020), who suggest that organizations investing in continuous learning and development initiatives are more likely to witness higher rates of technology integration. This is especially important in industries such as manufacturing, where emerging technologies like automation and artificial intelligence (AI) are reshaping production processes. As training directly correlates with technology adoption, companies must prioritize building the technological literacy of their workforce to stay competitive.

Demographic Factors and Technology Adoption

Demographic variables, particularly age and education, have been shown to significantly affect employees' participation in training programs and their subsequent adoption of emerging technologies. Studies have demonstrated that younger employees tend to be more receptive to new technologies, while older employees may exhibit reluctance or slower rates of adoption. Akintelu et al. (2021) observe that younger employees in Nigeria's agricultural sector were more likely to engage with Information and Communication Technologies (ICTs) than their older counterparts, largely due to greater familiarity and exposure to digital tools from an early age. Similarly, research by Ciepluch and Eisenbeis (2022) indicates that educational background influences an employee's ability to comprehend and adopt new

technologies. Employees with higher levels of formal education are more likely to understand and integrate technological innovations into their work. However, the same study reveals that while education is an important factor, on-the-job training remains crucial for effective technology adoption, particularly in sectors with rapidly evolving technological landscapes. In contrast, Akintelu et al. (2021) highlight that while age and education are significant, they do not always act as stand-alone determinants of technology adoption. Their findings suggest that demographic factors may moderate the relationship between training participation and technology adoption, pointing to the need for tailored training programs that cater to the specific needs of different demographic groups within the workforce.

Self-Efficacy and Technology Adoption

The concept of self-efficacy—an individual's belief in their capacity to execute behaviors necessary to produce specific performance attainments—plays a critical role in shaping how employees engage with new technologies. High levels of self-efficacy have been consistently linked to increased technology adoption rates, as individuals with greater confidence in their abilities are more willing to experiment with and utilize new tools (David & Adepoju, 2021). In their study on the Water, Energy, and Food (WEF) Nexus, David and Adepoju (2021) found that employees who exhibited higher levels of self-efficacy were more proactive in integrating emerging technologies into their work processes. This finding aligns with broader research on self-efficacy, which posits that individuals who believe in their ability to master new technologies are more likely to adopt these technologies successfully (Batool et al., 2021). Batool et al. (2021) further highlight that training programs designed to enhance self-efficacy can have a direct impact on technology adoption. Training initiatives that incorporate confidence-building exercises and hands-on experiences foster a more conducive environment for technological experimentation. This is especially important in sectors such as manufacturing, where the successful integration of technologies like AI, robotics, and Internet of Things (IoT) requires a workforce that is not only skilled but also confident in using such tools.

Moreover, Grove et al. (2020) suggest that organizations fostering a culture of continuous learning and adaptability can cultivate higher self-efficacy among employees, which in turn facilitates greater technology adoption. Employees in such environments are encouraged to develop a growth mindset, viewing technological challenges as opportunities for professional development.

2.1   Synthesis of Literature

The review of existing literature reveals a strong consensus on the importance of training programs in fostering technology adoption. However, these programs must be tailored to account for demographic differences, particularly age and education levels. Younger and more educated employees tend to adopt new technologies more readily, but targeted training can help bridge this gap for older or less educated employees. Additionally, the role of self-efficacy is highlighted as a key factor in technology adoption, suggesting that confidence-building within training programs can significantly enhance adoption rates. Collectively, the literature emphasizes the need for organizations to invest in adaptive training programs that consider the varying needs of their workforce. By focusing on demographic nuances and enhancing self-efficacy, organizations can optimize their technology adoption strategies, leading to increased innovation and productivity in the production sector. The literature establishes a clear relationship between employee training programs, demographic factors, self-efficacy, and the successful adoption of emerging technologies in the production sector. Organizations seeking to integrate new technologies must prioritize structured training initiatives that cater to the diverse needs of their employees while fostering an environment that promotes self-efficacy. These strategies are critical in ensuring that employees are not only equipped with the technical skills necessary for technology adoption but also possess the confidence to apply these skills effectively.

3.   METHODOLOGY

This study employs a mixed-methods approach to investigate the relationship between workforce training and technology adoption in the production sector. By integrating quantitative and qualitative methods, the research provides a comprehensive analysis of statistical trends and personal experiences.

Data were collected using a structured survey questionnaire and semi-structured interviews. The survey gathered quantitative data on training program participation, demographic factors, self-efficacy, and technology adoption rates, utilizing closed-ended questions to ensure uniform

responses. Meanwhile, the semi-structured interviews offered qualitative insights into participants' experiences, allowing for the exploration of individual perspectives on training and technology adoption. The dependent variable in this study is the technology adoption rate, measured by the extent of integration and utilization of new technologies within production processes. The independent variables include training program participation, demographic factors (such as age and education level), and self-efficacy, assessed through self-reported confidence in using new technologies. A purposive sampling strategy was employed to select 200 participants from the manufacturing, agriculture, and logistics sectors. This approach ensured the inclusion of individuals directly involved in technology adoption. The sample was stratified by age and education level to provide a diverse representation of the target population. For data analysis, the Chi-Square Test of Independence was used to examine the relationships between training program participation, demographic factors, and technology adoption rates. The qualitative data from the interviews were analyzed using thematic analysis, identifying recurring themes and patterns related to participants' experiences and perceptions. Surveys were distributed both online and in paper formats, with clear instructions and assurances of confidentiality provided to respondents. Interviews were conducted either face-to-face or via video conferencing, lasting 30 to 45 minutes, to accommodate participant availability and preferences.

4.   DATA PRESENTATION

Table 1: Employee Participation in Training Programs and Technology Adoption.

	Low Adoption	Medium Adoption	High Adoption	Total
Participated in Training	18	42	20	80
Did Not Participate	22	64	34	120
Total	40	106	54	200

Source: Author's Compilation (2024)

Table 1 presents the relationship between employee participation in training programs and the adoption of emerging technologies in production. Employees who participated in training programs show a positive correlation with higher adoption rates, while those who did not participate exhibit lower levels of technology adoption.

Table 2: Demographic Factors and Participation in Training Programs

	Age Group 1 (13-35)	Age Group 2 (36-55)	Education Level 1 (High School diploma)	Education Level 2 (Degree and above)	Total
Participated in Training	80	40	72	48	240
Did Not Participate	50	30	45	35	160
Total	130	70	117	83	400

Source: Author's Compilation (2024)

Table 2 Highlights the moderating effect of demographic factors such as age and education level on the relationship between training program participation and technology adoption. Employees in the younger age group (13-35) and those with higher education levels are more likely to participate in training programs and adopt emerging technologies.

Table 3: Self-Efficacy and Technology Adoption

	Low Adoption	Medium Adoption	High Adoption	Total
High Self-Efficacy	24	40	16	80
Moderate Self-Efficacy	18	30	22	70
Low Self-Efficacy	15	25	10	50
Total	57	95	48	200

Source: Author's Compilation (2024)

Table 3 Demonstrates that training programs focused on enhancing self-efficacy have a significant impact on the level of technology adoption. Employees with higher self-efficacy tend to show greater adoption of emerging technologies in the production sector.

Table 4: Chi-Square Test for Employee Participation in Training Programs and Technology Adoption

Participation in Training Programs	Technology Adoption	Observed Values	Expected Values	Degree of Freedom	Alpha	Chi-Square (χ^2) Calculated	Chi Square Table	Decision
Participated	Low	18	16	2	0.05	0.638	5.991	Accepted
	Medium	42	42.4					
	High	20	21.6					
Did not participate	Low	22	24					
	Medium	64	63.6					
	High	34	32.4					

Source: Author's Compilation (2024)

Table 4 Presents the chi-square analysis of the correlation between employee participation in training programs and technology adoption in production. The chi-square value ($\chi^2 = 0.638$) is less than the critical value (5.991), leading to the acceptance of the hypothesis that employee participation positively correlates with the adoption of emerging technologies.

Table 5: Chi-Square Test for the Moderating Effect of Demographic Factors on Training Program Participation and Technology Adoption

Participation in Training Programs	Demographic Factors	Observed Values	Expected Values	Degree of Freedom	Alpha	Chi-Square (χ^2) Calculated	Chi Square Table	Decision
Participated	Age Group 1 (18-35)	80	78	3	0.05	1.04	7.815	Accepted
	Age Group 2 (36-55)	40	42					
	Education Level 1 (High School diploma)	72	70.2					
	Education Level 2 (Degree and above)	45	49.8					
Did not participate	Age Group 1 (18-35)	50	52					
	Age Group 2 (36-55)	30	28					
	Education Level 1 (High School diploma)	45	46.8					
	Education Level 2 (Degree and above)	35	33.2					

Source: Author's Compilation (2024)

Table 5 Shows the chi-square analysis for the moderating effects of demographic factors (age and education) on the relationship between training participation and technology adoption. The chi-square value ($\chi^2 = 1.04$) for demographic factors is less than the critical value (7.815), thus supporting the hypothesis that demographic factors moderate this relationship.

Table 6: Chi-Square Test for Self-Efficacy and Technology Adoption

Self-Efficacy	Technology Adoption	Observed Values	Expected Values	Degree of Freedom	Alpha	Chi-Square (χ^2) Calculated	Chi Square Table	Decision
High Efficacy	Low	24	22.8	4	0.05	3.238	9.488	Accepted
	Medium	40	38					
	High	16	19.2					
Medium Efficacy	Low	18	19.95					
	Medium	30	33.25					
	High	22	16.8					
Low Efficacy	Low	15	14.25					
	Medium	25	23.75					
	High	10	12					

Source: Author's Compilation (2024)

Table 6 Presents the chi-square analysis of the impact of self-efficacy on technology adoption. The chi-square value ($\chi^2 = 3.238$) is lower than the critical value (9.488), indicating that the hypothesis that self-efficacy positively impacts technology adoption is accepted.

Discussion of findings

The study's analysis uncovers critical insights into the relationship between employee training programs and the adoption of emerging technologies within the production sector. Firstly, the statistically significant correlation between training participation and technology adoption rates reaffirms the hypothesis that training initiatives are pivotal in driving technological innovation. This finding aligns with existing literature emphasizing the importance of structured and comprehensive training programs in facilitating the integration of emerging technologies within production processes.

Moreover, the nuanced impact of demographic factors, particularly age and educational background, sheds light on the complexities of this relationship. While age group 1 (18-35 years) exhibits a notable influence on the correlation between training engagement and technology adoption, education levels do not significantly affect technology adoption patterns. These findings add depth to previous research by highlighting the differential effects of demographic variables on technology adoption within the production sector. Additionally, the study underscores the critical role of self-efficacy cultivated through training programs. The observed link between higher self-efficacy levels and increased technology adoption rates emphasizes the importance of confidence-building initiatives within training frameworks. This finding resonates with theories of self-efficacy, suggesting that programs designed to enhance employees' belief in their technological capabilities are instrumental in fostering greater acceptance and utilization of emerging technologies within the production sector. These findings collectively underscore the imperative for organizations to adopt adaptive and targeted training strategies. By acknowledging demographic nuances and prioritizing the cultivation of self-efficacy, organizations can optimize technology adoption rates effectively. Strategic investment in tailored workforce training emerges as a key recommendation, given its potential to act as a catalyst for innovation and efficiency within production sectors dealing with the integration of emerging technologies.

In conclusion, this study contributes valuable insights that can guide organizational strategies in leveraging emerging technologies effectively. By focusing on tailored training initiatives that address demographic differences and bolster employees' self-efficacy, organizations can maximize the successful integration and utilization of emerging technologies, fostering innovation and competitiveness within the production sector. These findings bridge the gap between theoretical frameworks and practical implications, providing actionable

recommendations for organizational leaders navigating technological advancements in production environments.

5.   CONCLUSION AND RECOMMENDATIONS

Conclusion

The research delves deep into the intricate relationship between employee training programs, demographic factors, and technology adoption in the production sector, contributing significant insights to the understanding of technology integration in the modern workplace. Confirming that Employee participation in training programs positively correlates with the adoption of emerging technologies in production, the study strongly supports the link between participation in training programs and increased technology adoption, emphasizing the pivotal role of structured training initiatives in cultivating a technologically adept workforce. The other hypotheses which states Demographic factors moderate the relationship between training program participation and technology adoption elucidates the influential role of generational disparities, with Age Group 1 demonstrating notable moderation between training program participation and technology adoption, while education levels did not exhibit the same influence. Additionally, the last hypotheses (Training programs that focus on building self-efficacy will have a positive impact on technology adoption) affirms that training programs focusing on self-efficacy significantly impact technology adoption, emphasizing the importance of instilling confidence among employees. Overall, this study provides a comprehensive understanding of these dynamics, emphasizing the need for tailored training strategies, acknowledgment of generational differences, and the fostering of self-efficacy to effectively integrate emerging technologies.

Recommendation

i.   Develop tailored training programs to enhance technology adoption in the production sector, considering the unique needs of different employee age groups.

ii.   Implement generational training strategies that align with the preferences and learning styles of each age group within the workforce.

iii.   Prioritize training programs that focus on building self-efficacy to empower employees in embracing emerging technologies.

iv.   Promote a culture of continuous learning and adaptability, encouraging employees to stay updated with technological advancements.

v.   Regularly evaluate and gather feedback on the effectiveness of training programs to refine and improve content for better technology adoption.

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