

Willingness to Learn Generative AI Among SME Employees: A Sectoral Comparison

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This report was compiled on October 14, 2024

Abstract

This research paper explores the willingness of employees from small and medium-sized enterprises (SMEs) to engage in learning about generative artificial intelligence (AI) and examines how this willingness varies across different sectors. Data were collected via a survey conducted among SME employees, utilizing Prolific services to access respondents, supported by funding from Breda University of Applied Sciences. Statistical analyses, including analysis of variance (ANOVA) and post-hoc pairwise comparisons using the T-test with Bonferroni correction, were performed to determine sector-specific differences in interest levels. The results showed that while employees in financial and professional services exhibited the highest interest in learning about generative AI, employees in customer service and retail were less inclined to do so. These findings underscore the importance of sector-specific AI education initiatives and managerial support in driving successful AI adoption.

Keywords: *SME, Willingness, AI, Learning, Education, Artificial Intelligence*

1. Introduction

Small and medium-sized enterprises (SMEs) play an essential role in global economic growth, providing the majority of employment opportunities and being the bedrock of innovation in various regions. SMEs’ agility and capacity to adapt to evolving market needs position them well to integrate technological advancements like artificial intelligence (AI). As the world becomes more reliant on data-driven decision-making, and process automation, businesses across sectors need to embrace AI to remain competitive. AI offers numerous possibilities, such as optimizing operations, improving customer experience, and enhancing creativity. Generative AI, in particular, has the potential to revolutionize how companies approach these challenges by producing new, valuable content based on existing data patterns. Generative AI refers to AI models that are capable of creating new information, such as text, images, or other media, based on patterns and examples learned from large datasets. Popular examples of generative AI include models such as GPT-3 and DALL-E, which can generate human-like text and create images from textual input, respectively. Such innovations allow businesses to automate content creation, generate insights, and optimize operations with minimal human input. However, widespread AI adoption depends on employees’ willingness and ability to learn these new technologies. Given that SMEs are more resource-constrained than large enterprises, they must adopt AI technologies strategically to remain relevant amid rapidly advancing technological landscapes. This study investigates the willingness of SME employees from different sectors to learn about generative AI, considering that industry-specific challenges and needs may influence employees’ perceptions and enthusiasm for AI adoption. By surveying employees from various sectors, this research aims to assess sectoral differences in AI learning willingness and explore the underlying reasons that drive or hinder this interest. The results of this study are expected to provide important insights into which industries are more inclined to invest in AI education for their employees and how SMEs across sectors can better prepare their workforce for the future. This research also highlights the role of managerial support and organizational culture in fostering employees’ enthusiasm for technological learning. The ultimate goal is to offer recommendations for promoting AI education in sectors that are currently lagging and identify opportunities for businesses to leverage generative AI to their advantage.

1.1. Research question

The research question I aim to answer:

- Does SME employees’ willingness to learn about generative AI differ per business sector?

2. Literature Review

2.1. Growing market

The number of SMEs has been growing rapidly over the years, and it does not look like it is slowing down. This growth is mostly due to rising number of micro enterprises entering the market. In the European Union between 2020 and 2024, the number of small and medium enterprises rose by 8% and 4,5% respectively. But when it comes to Micro enterprises (0-9 employees) the rise was more significant of 12,9% through these years. The smallest companies make up the majority of SMEs, with a share of nearly 94%. As more companies are created, there is an increased demand for the workforce. (Statista, 2024d).

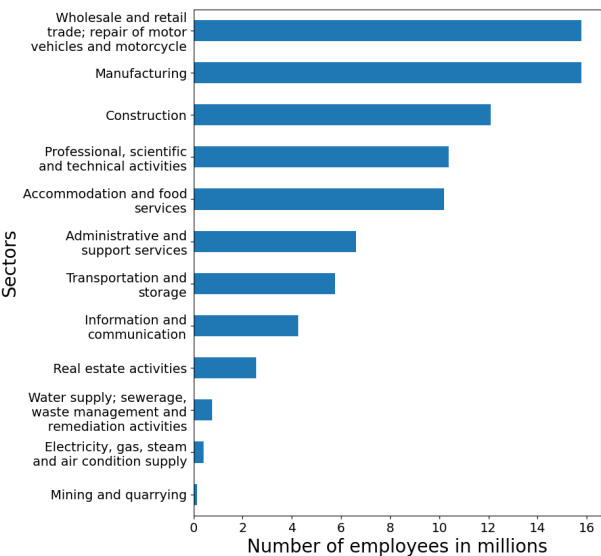


Figure 1. Number of persons employed in small and medium-sized enterprises (SMEs) in the non-financial business economy of the European Union in 2024, by sector (Statista, 2024c)

The graph (Figure 1) shows that in the European Union nearly 16 million people worked in wholesale, retail trade and repair of motor vehicles and motorcycle, which is prominent sector when it comes to employment. The implementation of AI, could bring significant improvements in speed, quality and task completion (Dell'Acqua et al., 2023), such populated sector might gain substantially from investing in education of this technology. "It is important for enterprise to invest in lifelong learning, not only to improve the knowledge and skill levels of employees, but also to improve their employability" (Kok et al., 2012).

2.2. Opportunities in Retail

Numerous improvements could be made by implementing AI solutions in retail sector, such as demand forecasting, informed pricing decisions, optimized product ordering and placement, and tracking data from online channels to inform e-commerce and digital promotion strategies (Intel, n.d.). In the Netherlands, Jumbo supermarkets started using AI software to detect suspicious movements of customers in order to detect possible theft. But the systems are not limited to theft prevention, with the infrastructure ready they are being used to "improve the shopping experience and optimise business processes" (Vels, 2024). Those examples might be a good indication to learn about AI before competition does it, not to fall behind on in adopting the latest innovations and stay in the game.

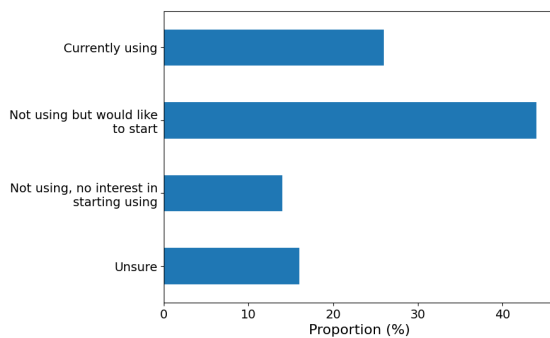


Figure 2. Likelihood of small businesses (SMBs) to invest in artificial technology (AI) and/or automation technology in the next 12 months in the United States as of June 2023 (Statista, 2023)

For education to be most effective, a person needs to be willing to acquire knowledge. As the research aims to investigate how interested in education in generative AI field are employees of various sectors, I have discovered that customer service and retail sector desire to learn about it the least. In contrast, Financial and professional services exhibit the greatest interest in education in this field of technology. Based on research article from 2021 "Occupational, industry, and geographic exposure to artificial intelligence: A novel dataset and its potential uses" (Felten et al., 2021) we know that the highest exposure to Artificial Intelligence is for securities, commodity contracts, and other financial investments and related activities. As the research focuses on SMEs, nowadays many newly created enterprises aim to get the highest valuations possible. This drives company's growth and allows it to find many investors ready to support a small company to make it bigger and more profitable. There is a term unicorn, which in finance represents a privately owned startup company valued over 1 billion United States Dollars (USD). The graph (Figure 3) shows shares of unicorns by industries and it clearly tells us that financial technology (fintech) is dominating by 7 percentage points. Implementation of AI in financial industry offers many advancements in various fields, some of them are risk management, customer targeting and customer engagement (Artificial Intelligence and Fintech: An Overview of Opportunities and Risks for Banking, Investments, and Microfinance - Ashta - 2021 - Strategic Change - Wiley Online Library, n.d.). The interest in this technology by the financial and professional

services sectors allows it to grow faster, because "if AI and Big Data are used properly, they can significantly transform existing financial trends and quality to a diversified and progressed level" (Ahmadi, 2024).

2.3. Willingness to invest

Innovations in AI let growing number of industries implement it to perform various complicated tasks that either enhances human work or assist them. This makes it more interesting for SMEs, because better performance and/or faster task completion gives an advantage to grow quicker. A survey was conducted in 2023 in United States among SMEs on likelihood of investing in artificial and/or automation technology. It shows strong interest in implementation such systems, as only 30% were either not sure and not willing to use them. The proportion of respondents that are not using those technologies, but would like to start was 44% It tells us a lot about SMEs sporting potential opportunities in this rapidly developing technology.

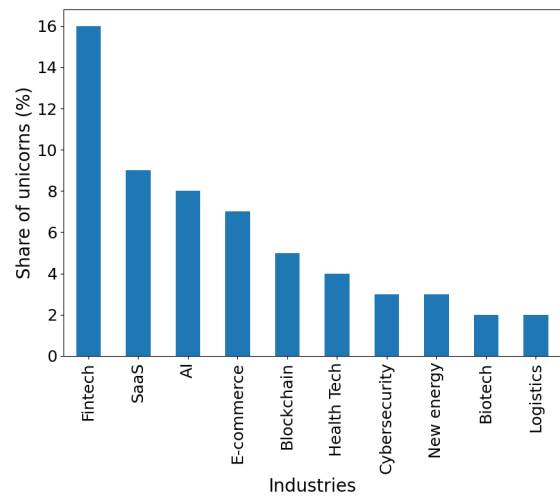


Figure 3. Industries with the highest share of unicorns worldwide as of 2023 (Statista, 2024b)

2.4. Concerns

For employee training management must be certain that investment from that will bring some returns. Thus, I think management plays crucial role in delivering opportunities by understanding potential value of AI technology. Globally people are mostly concerned about generating scams with AI, deepfakes, sexual or online abuse by AI, hallucinations that could arise undetected, that's what we know from online survey conducted in 2023.

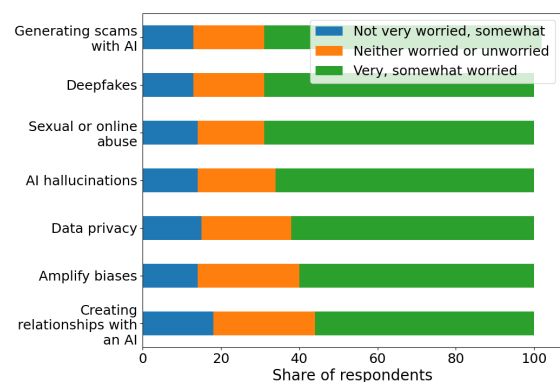


Figure 4. Global concerns over the use of generative artificial intelligence (Gen AI) in 2023 (Statista, 2024a)

How does it affect industries, and what can be done to minimize negative outcomes? Education might provide an answer, though it's

only the starting point. To implement such tools as Generative AI support needs to be going from higher positioned people a company. As two examined sectors have similar limitations in learning, for financial and professional services lack of management support seems to play a greater role. People managing teams would first need to learn how to fight all those concerning factors and this might help them make a more informed decision on investing in education for their supervises.

3. Methodology

3.1. Hypothesis

By performing this research I will test this hypothesis:

- H0: Willingness of SME employees to learn about generative AI doesn't change in relation to business sector.
- HA: Willingness of SME employees to learn about generative AI differs across business sectors.

For this process I will use significance level of 0.05.

3.2. Data Collection

Data for this study were collected through a survey distributed via Proflific services, an online platform that facilitates access to a wide pool of participants for research purposes. The survey targeted employees working in small and medium-sized enterprises (SMEs) across various sectors, including retail, finance, education and real estate, among others. Funding from Breda University of Applied Sciences supported the survey's deployment, ensuring that a diverse and representative sample of SME employees was reached. The survey consisted of questions designed to measure employees' willingness to learn about generative AI, as well as their perceptions of its relevance and potential impact on their work. Participants were asked to rate their interest in learning about generative AI on a scale ranging from 1 (not interested) to 5 (very interested). Additionally, demographic information, including sector, age, and educational level, was collected to allow for nuanced analysis of sector-specific trends in AI learning willingness.

3.3. Sample Size

The survey yielded a total of 175 responses from employees across various sectors. However, certain sectors had limited representation due to a lower number of respondents. To address this issue sectors were grouped into higher level categories, as presented in Table 1. In the final analysis I focused on the two sector groups: financial and professional services, consumer services and retail. The sample size for these sectors allowed for meaningful statistical analysis while still providing insights into broader sector-wide differences.

3.4. Statistical Analysis

The data collected were analysed using statistical methods, including analysis of variance (ANOVA) to assess differences in AI learning interest between sectors. ANOVA is a statistical technique that helps determine whether there are significant differences between the means of three or more groups. In this case, the groups represented employees from different sectors. The null hypothesis stated that there would be no significant differences in AI learning interest across sectors. After establishing that significant differences existed through the ANOVA test, post-hoc pairwise comparisons were conducted using T-tests. This approach allowed for a more granular analysis of the specific sectors that exhibited differences in willingness to learn about generative AI. To control for the risk of Type I errors due to multiple comparisons, the Bonferroni correction was applied. A complete hypothesis testing script can be found in references (Kudyba, 2024).

Higher-Level Sector	Lower-Level Sector
Technology, Media, and Communications	Information Services and Data Processing
	Software
	Telecommunications
	Broadcasting
	Publishing
	Scientific or Technical Services
	Consulting
Financial and Professional Services	Finance and Insurance
	Real Estate, Rental, and Leasing
	Legal Services
	Wholesale
	Government and Public Administration
Consumer Services and Retail	Retail
	Hotel and Food Services
	Arts, Entertainment, and Recreation
	Education (K-12, College, University, Adult)
Healthcare and Life Sciences	Healthcare and Pharmaceuticals
Industrial, Manufacturing, and Infrastructure	Manufacturing and Engineering
	Construction
	Transportation and Warehousing
	Military
Energy, Resources, and Environment	Agriculture, Forestry, Fishing and Hunting
	Mining
Other	Other

Table 1. Table of Sectors and Sub-Sectors

4. Results

4.1. ANOVA Results

The ANOVA test results revealed statistically significant differences in the willingness to learn about generative AI across different SME sectors. Specifically, the test indicated that employees in the financial services sector expressed a higher interest in AI education compared to those in the retail and customer service sectors. This finding enabled the rejection of the null hypothesis (p-value = 0.0048), suggesting that there are indeed differences in AI learning interest based on sector. The ANOVA results are summarized as follows:

- Financial Services: 4.82 (mean rating)
- Customer Service and Retail: 4.28 (mean rating)

These findings highlight the varying levels of interest in AI learning across different sectors. The financial services sector, characterized by its reliance on data analytics and technology-driven processes, showed the highest interest level, suggesting that employees in this sector recognize the potential benefits of AI in their roles.

4.2. T-Test Results

Following the ANOVA test, pairwise T-tests were performed to identify specific sector differences in willingness to learn about generative AI. After applying the Bonferroni correction to control for multiple comparisons, the results indicated that while none of the sector pairs did exhibit statistically significant differences in AI learning interest, one noteworthy comparison emerged.

- Financial Services vs. Retail: Employees in the financial services sector (mean rating 4.82) exhibited a significantly higher

willingness to learn about generative AI than employees in the retail sector (mean rating 4.28).

- **Financial Services vs. Other:** Employees in financial services (mean rating 4.82) also showed a greater interest in AI learning compared to those in other sectors than listed on the survey (mean rating 4.00). Due to lack of information on this group of sectors I decided not to analyse this pair.

The figure 5 presents all p-values computed with a statistical pairwise mean comparison (T-Test).

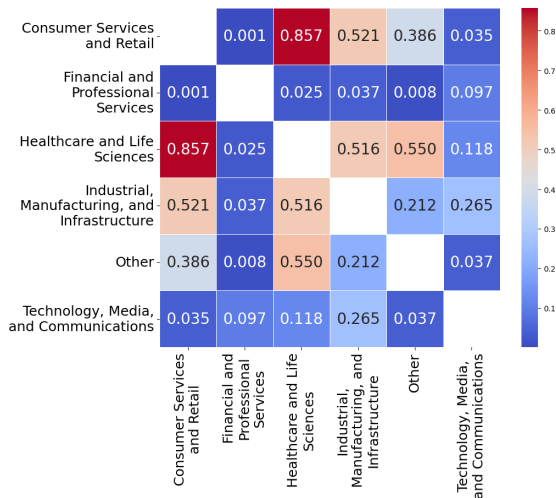


Figure 5. Matrix of p-values obtained through T-Tests

4.3. Sector-Specific Trends

The survey data highlighted several significant trends related to sector-specific willingness to learn about generative AI. Employees in the financial services sector demonstrated a strong inclination to pursue AI education, with all of respondents rating their interest as a 4 or 5 on the Likert scale. This trend aligns with the increased adoption of AI technologies in financial services, where AI is being utilized for risk management, fraud detection, and enhancing customer service through chatbots and virtual assistants. In contrast, employees in the retail and customer service sectors exhibited lower interest in AI education. This disparity may be due to various factors, including a lack of awareness regarding the potential benefits of AI in their industries, concerns about job displacement, or a focus on immediate, customer-facing tasks. The differences in interest levels suggest that while some sectors are proactively embracing AI, others may require additional support and education to understand its relevance and applications. This highlights the need for tailored training initiatives and increased managerial engagement to foster a culture of learning around AI technologies in sectors that are lagging behind.

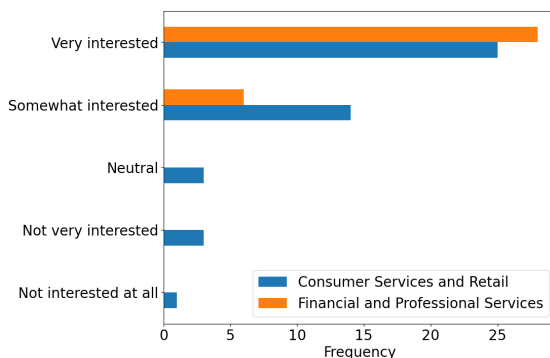


Figure 6. Distribution of interest across sectors, question: How interested are you in learning to use generative AI tools to enhance your work in your current role?

5. Discussion

5.1. Analysis of Sectoral Differences

The results of this study offer valuable insights into the sectoral differences in willingness to learn about generative AI among SME employees. The significant interest shown by employees in the financial services sector reflects the industry's ongoing integration of AI technologies and its focus on data-driven decision-making. Given that financial services are increasingly adopting AI for various applications, such as predictive analytics and customer service automation, employees in this sector are likely to perceive AI education as directly beneficial to their roles. In contrast, the lower levels of interest in AI education among employees in the retail and customer service sectors may indicate a disconnect between the potential of AI and employees' current awareness and understanding of its applications. Employees in these sectors may be less familiar with how generative AI can enhance their work processes or may hold reservations about its impact on job security. Additionally, the focus on immediate, day-to-day tasks in retail and customer service may detract from employees' willingness to engage in long-term learning initiatives, particularly if they do not see immediate benefits. Employees in certain sectors, such as retail and customer service, exhibit a higher level of skepticism regarding AI technology's potential to reduce errors in their work processes. This contrasts with the attitudes observed in the Financial and Professional Services sectors, where workers demonstrate greater confidence in AI's ability to minimize errors. However, alongside this optimism, employees in these sectors also express heightened concerns about the potential for AI to lead to job displacement. The accompanying graphs illustrate the relationship between industry sectors and perceptions of AI's error-reduction capabilities, as well as concerns about job security.

These findings suggest that sector-specific training programs should be developed to address the unique challenges and opportunities presented by AI in each industry. For instance, financial services could benefit from advanced AI training that covers data analytics, machine learning models, and their applications in risk management. In contrast, the retail sector may require more foundational education about AI's potential benefits, along with case studies demonstrating successful AI adoption in similar organizations.

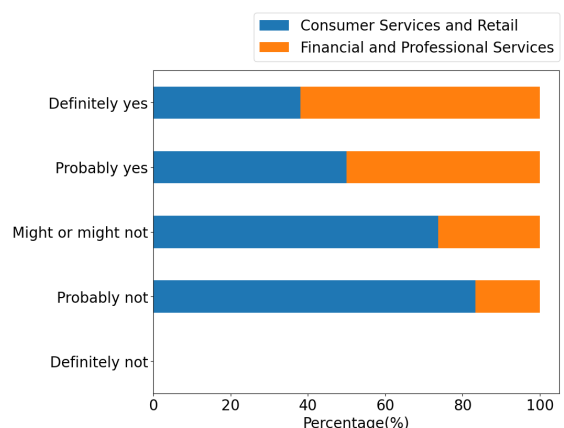


Figure 7. Proportion of responses, question: Do you think using AI tools could help reduce errors in your work?

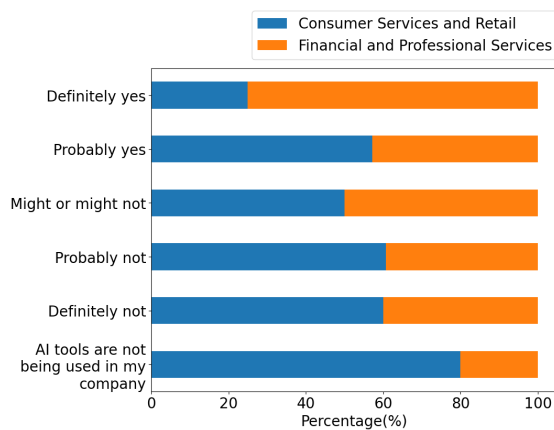


Figure 8. Proportion of responses, question: Do you believe that your company's use of AI tools puts your current job at risk?

5.2. Importance of Managerial Support

A critical factor making a difference in employees' willingness to learn about AI is the level of managerial support provided within organizations. In sectors like financial services, where management is more likely to recognize the value of AI technologies, employees are more inclined to engage in learning and upskilling efforts. This highlights the necessity for managers to actively promote and support AI education initiatives within their organizations. When employees see their leaders embracing AI and investing in their development, they are more likely to feel empowered to pursue their own learning opportunities. Conversely, in sectors where management may be less informed about AI's potential benefits or may have concerns regarding the cost and complexity of AI implementation, employees may be less motivated to invest time and effort into learning. In such cases, it is vital for organizational leaders to not only promote the value of AI but also create a supportive environment that encourages continuous learning. This may involve allocating resources for training programs, providing access to educational materials, and fostering a culture of collaboration around AI initiatives. To foster a culture of AI education, SMEs should consider implementing mentorship programs where more knowledgeable employees guide their colleagues in AI learning. Moreover, organizations could establish cross-functional teams that allow employees from different departments to collaborate on AI-related projects, thereby increasing exposure and understanding of generative AI's potential applications.

5.3. Implications for AI Adoption in SMEs

The findings of this research hold significant implications for the broader landscape of AI adoption in SMEs. Industries such as retail and customer service, which stand to gain immensely from AI technologies, must prioritize employee education and training initiatives to bridge the gap in interest and understanding. By investing in AI education, SMEs can unlock new opportunities for growth and innovation while simultaneously enhancing operational efficiency and customer satisfaction. Moreover, as AI technologies become increasingly accessible and affordable, the barriers to adoption are likely to diminish. This presents a unique opportunity for SMEs across all sectors to invest in AI education and upskilling programs, thereby equipping their workforce with the necessary skills to remain competitive in an ever-evolving technological landscape. The successful adoption of AI will ultimately depend on SMEs' ability to support a culture of learning and provide employees with the tools they need to take advantage of AI's full potential.

5.4. Recommendations for Future Research

While this study provides valuable insights into sectoral differences in willingness to learn about generative AI among SME employees,

further research is necessary to build on these findings. Future studies could expand the sample size to include a more diverse range of sectors, ensuring that voices from underrepresented industries are heard. Researchers could also explore the long-term effects of AI education initiatives on actual AI adoption rates within SMEs. By tracking organizations that invest in training and development programs over time, researchers can gain a better understanding of the relationship between willingness to learn and successful AI implementation. This could help identify best practices and effective strategies for promoting AI education across different sectors.

5.5. Contribution to the Field

This research makes a meaningful contribution to the field of SME management, AI adoption, and workforce development by offering sector-specific insights into employees' willingness to learn about generative AI technologies. It highlights the role of industry characteristics in shaping AI learning interest, emphasizing the disparity between sectors such as financial services and customer-facing industries like retail and customer service. By employing rigorous statistical methods, including ANOVA and T-tests with Bonferroni corrections, the study provides robust evidence that certain sectors exhibit significantly higher interest in AI education. The identification of financial services as a leader in AI learning interest underscores the influence of AI's tangible applications in data analytics, fraud detection, and customer service automation in driving engagement with AI technologies. Moreover, the study reveals the need for more proactive engagement and education in sectors where AI adoption lags, like retail, suggesting that these sectors may benefit from targeted training programs to close the knowledge gap.

5.6. Limitations

While this study offers important insights into sectoral differences in willingness to learn about generative AI among SME employees, it is essential to acknowledge its limitations.

1. **Sample Size and Representation:** Although the survey included a range of sectors, the sample size may not fully capture the diversity of SMEs across all industries. Certain sectors had limited representation, leading to the exclusion of specific sectors in the final analysis. Future research should aim for more balanced and representative samples across all sectors to increase the credibility of findings.
2. **Data collection:** While data collection through Prolific offers an easy way of collecting valuable responses, concerns about potential bias remain. The company states that their collection practices and filters applied guarantee highest data quality, but there are not any clear outlines of survey distribution.
3. **Focus on Willingness to Learn:** This study primarily focuses on employees' willingness to learn about generative AI, rather than their actual learning experiences or outcomes. Future research could explore the effectiveness of specific training programs or educational interventions to provide a more comprehensive understanding of AI learning in SMEs.
4. **Causality:** The analysis conducted does not establish causality between sector and willingness to learn. While differences were observed, it remains unclear whether these differences are the result of sector characteristics, organizational culture, or other external factors influencing employee perceptions of learning AI.
5. **Temporal Context:** As the AI landscape evolves rapidly, the findings of this study may only reflect a snapshot of employee attitudes at a specific point in time. Continuous research is necessary to keep pace with changing technological trends and their implications for workforce education and development.

Despite these limitations, this study serves as a valuable starting point for understanding sectoral differences in willingness to learn

about generative AI among SME employees. The insights gained can guide future researchers and inform policy initiatives aimed at promoting AI education and adoption across various industries.

6. Conclusion

The findings of this study highlight the significant sectoral differences in the willingness of SME employees to learn about generative AI, underscoring the need for education and training initiatives to address these differences. Employees in the financial services sector demonstrated the highest interest in AI education, likely reflecting the industry's active engagement with AI technologies. In contrast, employees in the retail and customer service sectors exhibited lower interest, indicating potential barriers to AI adoption that must be addressed. To promote effective AI integration, SMEs across all sectors should prioritize the development of supportive learning environments that encourage employees to engage with AI technologies. Managerial support is crucial in fostering a culture of continuous learning and innovation, ensuring that employees feel empowered to pursue AI education opportunities. By investing in tailored training programs and creating a collaborative environment, SMEs can enhance their workforce's capacity to adapt to emerging technologies, ultimately driving growth and innovation. This research contributes to a growing body of literature on AI adoption in SMEs, emphasizing the importance of understanding sector-specific needs and challenges. By addressing the identified gaps in willingness to learn and providing targeted educational interventions, SMEs can position themselves to harness the potential of generative AI and navigate the evolving landscape of technology. The path forward involves collaboration among stakeholders, including educational institutions, industry organizations, and government agencies, to develop comprehensive training programs that equip employees with the skills necessary to thrive in an AI-driven world. As SMEs continue to play a vital role in the global economy, empowering their workforce through education and support will be essential for fostering a resilient and innovative business environment.

7. Disclosure

This paper was written with help of ChatGPT (OpenAI, 2024). The generative AI provided rephrasing suggestions and checked for any spelling errors.

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