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IMPACT OF TECHNOLOGY ON WOMEN'S CAREER TRAJECTORIES

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Abstract

This study examines the relationship between technological integration in work environments and the career trajectories of women. A sample of 500 participants was gathered through convenience sampling, and data were collected using Likert scales to gauge perceptions and attitudes. Descriptive statistics revealed diverse opinions among participants regarding the influence of technology on women's career advancement opportunities. A linear regression analysis was conducted, which indicated a significant relationship between technological integration and women's career trajectories ($F(1,499) = 93.84$, $p < .001$, $R2 = .16$). The results suggest that a one-unit increase in technological integration corresponds to a 0.45-unit increase in women's career trajectories. Despite the study's contributions, limitations such as sampling bias and reliance on self-reported data are acknowledged. Nevertheless, the findings underscore the importance of considering technological factors in addressing gender disparities in the workforce and promoting inclusive workplace environments. Further research exploring additional factors influencing career outcomes is recommended to provide a comprehensive understanding of gender equity in the workplace.

Keywords: *Technological integration, Women's career trajectories, Gender disparities, Workforce diversity, Workplace environment, Career advancement opportunities.*

INTRODUCTION

Technology has had a significant impact on women's career trajectories, both positively and negatively. On the positive side, the rise of technology has created new opportunities for women in various fields, particularly in science, technology, engineering, and mathematics (STEM). Women have made significant contributions to the development of technology, from the first computer programmer, Ada Lovelace, to modern innovations like hybrid cars, which would not have existed without the work of women like Annie Easley (The Past and Future of Women's Role in Tech, n.d.). However, despite these advancements, women continue to face significant challenges in the tech industry. The gender gap in technology is evident in the low representation of women in tech roles, with only 22% of all tech roles across European companies being occupied by women (Blumberg et al., 2023). This disparity is even more pronounced in leadership positions, with women accounting for only 28% of executive roles globally and only 7% of executive-level positions in India (Tech's Gender Reboot: Fostering Female Technology Leadership in India, n.d.). One of the primary reasons for the underrepresentation of women in tech is the lack of support and opportunities for career advancement. Women often cite a lack of strong management support and good opportunities as reasons for leaving tech careers, with half of women in tech leaving the industry by the midpoint of their career (Blumberg et al., 2023). To address this issue, organizations need to develop effective diversity, equity, and inclusion (DEI) practices, such as strong assessment and measurement programs and accountability, and integrate them into the natural flow of business (Blumberg et al., 2023). Another challenge faced by women in tech is the lack of work-life balance and flexibility. Around 7% of European women are out of the workforce due to caregiving responsibilities, and almost one in four women cite lack of work-life balance as a key reason for leaving tech careers (Blumberg et al., 2023). To retain women in tech, companies need to offer remote or hybrid working programs, flexible working hours, and on-site childcare (Blumberg et al., 2023). To increase the number of women in tech roles, organizations can also focus on hiring women from untapped pools, training them in modern technologies, and building up their tech skills (Blumberg et al., 2023). This can help increase graduation rates for women in STEM and increase their overall numbers in tech by about 225,000-695,000

Significance: Understanding how technology impacts women's career paths is crucial for addressing gender inequalities in the workplace and promoting gender equality. By studying this relationship, we can develop targeted interventions and inclusive policies to support women's advancement in technology-driven industries, ensuring equitable access to opportunities and preventing the widening of gender gaps.

Scope: This research investigates how technology integration influences women's career trajectories across diverse industries and organizational settings. It explores factors such as access to technology, digital skill

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development, workplace culture, and structural barriers, considering intersectional factors like race, ethnicity, socioeconomic status, and age. Comparative analyses across regions may provide insights for policy recommendations aimed at fostering gender-inclusive technological environments and promoting women's professional growth.

OBJECTIVES

To investigate the relationship between the level of technological integration in various work environments and the career trajectories of women

Hypothesis:

(H0): There is no significant relationship between the level of technological integration in work environments and the career trajectories of women.

REVIEW OF LITERATURE

Research has shown that women's career satisfaction in technology fields is influenced by self-efficacy, outcome expectations, and perceived social support (Nguti, 2019). However, they also perceive a more significant and negative relationship between technology overload and job performance (Wisniewski, 2011). The impact of the information revolution and the feminist movement has led to improvements in women's careers in computing (Scheffler, 1999). Additionally, technical competence and familiarity with the field are important factors in women's decisions to enter technology-oriented careers (Niiranen, 2015).

The level of technological integration in work environments is a complex and multifaceted concept, influenced by various factors. Joshua-Gojer (2015) emphasizes the importance of technology integration in the workplace, linking it to knowledge, learning, and innovation. Mohrman (2000) underscores the significance of lateral integration processes in high technology settings, highlighting the role of organizational design and human resources management. Iansiti (1995) identifies skills and routines for technology integration as key drivers of R&D performance in environments with discontinuous technological change. Almeida (2009) adds a psychological dimension, suggesting that manager's attitude toward technology can influence IT adoption levels in organizations.

Niiranen (2015) found that technical competence and familiarity with the field were key factors in women's decisions to pursue careers in technology. Howe-Walsh (2020) highlighted the role of national context, family centrality, and the desire to be a role model in Emirati women's career choices in the technology sector. Nguti (2019) identified self-efficacy, outcome expectations, and perceived social support as positive influencers of career choice satisfaction among female technology students, while academic-family role conflict was a negative influencer. Scheffler (1999) discussed the impact of the information revolution and the feminist movement on the careers of three women in the computing industry, emphasizing the need for continued improvements for women in technology. These studies collectively underscore the complex interplay of individual, societal, and historical factors in shaping women's career trajectories in technology.

RESEARCH METHODOLOGY

Sample Size and Sampling Technique: A sample of 500 participants was collected using convenience sampling.

Data Collection: Likert scale was used for data collection to measure participants' perceptions and attitudes.

Research Instrument: The survey included questions about the perceived impact of technological integration on women's career advancement opportunities, the influence of technology on women's career paths, and the importance of studying this relationship to address gender disparities.

Statistical Analysis Techniques: Descriptive statistics were used to summarize the demographic characteristics and responses of the participants. A linear regression analysis was conducted to assess the relationship between technological integration in work environments and women's career trajectories. Assumptions such as normality, homoscedasticity, multicollinearity, and outliers were checked.

Result & Findings:

Descriptive Statistics

Table 1: Age group	Counts	% of Total
Above 30	254	50.7 %
Below 30	247	49.3 %

Table 2: Technological Integration in Work Environments		
1. To what extent do you believe that the level of technological integration in workplaces affects the career advancement opportunities for women?	Counts	% of Total
Strongly disagree	68	13.6 %

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Disagree	56	11.2 %
Neutral	123	24.6 %
Agree	153	30.5 %
Strongly agree	101	20.2 %
2. How much do you perceive technology to be a factor in shaping the career paths of women in today's workforce?	**Counts**	**% of Total**
Not at all	76	15.2 %
Slightly	150	29.9 %
Moderately	128	25.5 %
Significantly	99	19.8 %
Extremely	48	9.6 %

Table 3: Career Trajectories of Women		
To what degree do you think technological advancements influence the availability of leadership positions for women in technology-driven industries?	**Counts**	**% of Total**
Not at all	31	6.2 %
To a small extent	30	6.0 %
To a moderate extent	102	20.4 %
To a large extent	170	33.9 %
To a very large extent	168	33.5 %
How confident are you that understanding the relationship between technology integration and women's career trajectories can lead to more inclusive workplace environments?	**Counts**	**% of Total**
Not at all confident	181	36.1 %
Slightly confident	129	25.7 %
Moderately confident	89	17.8 %
Very confident	64	12.8 %
Extremely confident	38	7.6 %
How important do you believe it is to study the impact of technology on women's career trajectories in order to address gender disparities in the workforce?	**Counts**	**% of Total**
Not important	27	5.4 %
Somewhat important	41	8.2 %
Important	124	24.8 %
Very important	185	36.9 %
Extremely important	124	24.8 %

Testing of Hypothesis:

(H0): There is no significant relationship between the level of technological integration in work environments and the career trajectories of women.

Result:

A linear regression analysis was conducted to assess whether Technological Integration in Work Environments significantly predicted Career Trajectories of Women.

Assumptions

Normality. The assumption of normality was assessed by plotting the quantiles of the model residuals against the quantiles of a Chi-square distribution, also called a Q-Q scatterplot (DeCarlo, 1997). For the assumption of normality to be met, the quantiles of the residuals must not strongly deviate from the theoretical quantiles. Strong deviations could indicate that the parameter estimates are unreliable. Figure 1 presents a Q-Q scatterplot of the model residuals.

Figure 1

Q-Q scatterplot for normality of the residuals for the regression model.

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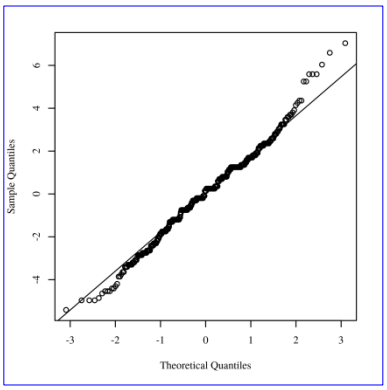
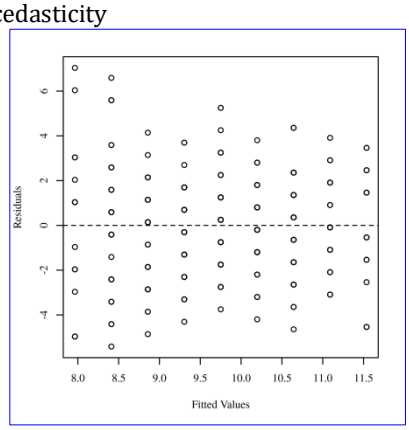


Homoscedasticity. Homoscedasticity was evaluated by plotting the residuals against the predicted values (Bates et al., 2014; Field, 2017; Osborne & Walters, 2002). The assumption of homoscedasticity is met if the points appear randomly distributed with a mean of zero and no apparent curvature. Figure 2 presents a scatterplot of predicted values and model residuals.

Figure 2

Residuals scatterplot testing homoscedasticity

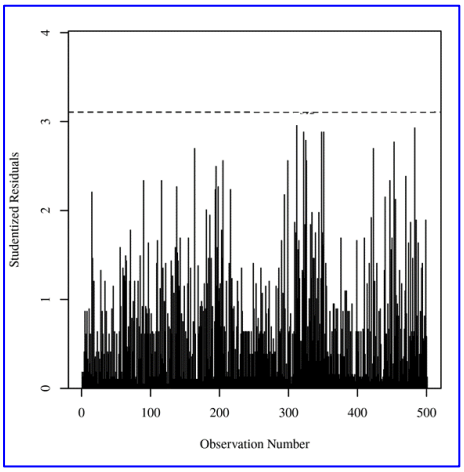


Multicollinearity. Since there was only one predictor variable, multicollinearity does not apply, and Variance Inflation Factors were not calculated.

Outliers. To identify influential points, Studentized residuals were calculated and the absolute values were plotted against the observation numbers (Field, 2017; Pituch & Stevens, 2015). Studentized residuals are calculated by dividing the model residuals by the estimated residual standard deviation. An observation with a Studentized residual greater than 3.11 in absolute value, the 0.999 quantile of a t distribution with 500 degrees of freedom, was considered to have significant influence on the results of the model. Figure 3 presents the Studentized residuals plot of the observations. Observation numbers are specified next to each point with a Studentized residual greater than 3.11.

Figure 3

Studentized residuals plot for outlier detection



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RESULTS

The results of the linear regression model were significant, $F(1,499) = 93.84$, $p < .001$, $R^2 = .16$, indicating that approximately 15.83% of the variance in Career Trajectories of Women is explainable by Technological Integration in Work Environments. Technological Integration in Work Environments significantly predicted Career Trajectories of Women, $B = 0.45$, $t(499) = 9.69$, $p < .001$. This indicates that on average, a one-unit increase of Technological Integration in Work Environments will increase the value of Career Trajectories of Women by 0.45 units. Table 3 summarizes the results of the regression model.

Table 3
Results for Linear Regression with Technological Integration in Work Environments predicting Career Trajectories of Women

Variable	B	SE	95.00% CI	β	t	p
(Intercept)	7.07	0.30	[6.49, 7.65]	0.00	23.97	< .001
Technological Integration in Work Environments	0.45	0.05	[0.36, 0.54]	0.40	9.69	< .001
Note. Results: $F(1,499) = 93.84$, $p < .001$, $R^2 = .16$ Unstandardized Regression Equation: Career Trajectories of Women = 7.07 + 0.45*Technological Integration in Work Environments						

Bootstrapping. Bootstrapping was performed (N = 1,000) to assess which predictors significantly predicted Career Trajectories of Women. Technological Integration in Work Environments significantly predicted Career Trajectories of Women, $B_0 = 0.45$, SE = 0.06, 95.00% CI [0.33, 0.56]. This indicates that on average, a one-unit increase of Technological Integration in Work Environments will increase the value of Career Trajectories of Women by 0.45 units.

Table 4
Results for Bootstrapping the Regression Coefficients.

Variable	B_0	SE	95.00% CI
(Intercept)	7.07	0.38	[6.34, 7.81]
Technological Integration in Work Environments	0.45	0.06	[0.33, 0.56]

DISCUSSION

The findings of the study provide valuable insights into the relationship between technological integration in work environments and women's career trajectories. The significant relationship observed between these variables suggests that technological advancements indeed play a crucial role in shaping the career paths of women. This aligns with the increasing importance of technology in today's workforce and highlights its impact on career opportunities for women.

The descriptive statistics reveal varying perceptions among participants regarding the influence of technological integration on women's career advancement opportunities. While a substantial portion agrees or strongly agrees on the positive impact of technology, there are also respondents who hold neutral or negative views. This diversity in perceptions underscores the complexity of the issue and suggests the need for further exploration.

The regression analysis confirms the hypothesis that there is a significant relationship between technological integration in work environments and women's career trajectories. The coefficient obtained indicates that a one-unit increase in technological integration corresponds to a 0.45-unit increase in women's career trajectories. This finding underscores the importance of considering technological factors when examining gender disparities in the workforce and designing interventions to promote gender equality.

LIMITATIONS OF THE STUDY

Despite the valuable insights provided by this study, several limitations should be acknowledged. Firstly, the use of convenience sampling may limit the generalizability of the findings to broader populations.

Secondly, the reliance on self-reported data through Likert scales introduces the possibility of response bias.

CONCLUSION

In conclusion, the findings of this study highlight the significant relationship between technological integration in work environments and women's career trajectories. The positive association observed underscores the importance of considering technological factors in efforts to promote gender equality in the workforce. By understanding how technology shapes career opportunities for women, organizations and policymakers can develop more inclusive strategies to address gender disparities and create supportive work environments for

all employees. However, it is essential to acknowledge the limitations of the study and continue investigating this complex issue to inform evidence-based interventions and policies aimed at achieving gender equity in the workplace.

The findings of this study have several implications for policymakers, organizations, and educational institutions. Firstly, they highlight the importance of considering technological factors in initiatives aimed at promoting gender equality in the workforce. Policymakers can use this information to develop policies supporting women's access to technology-related education and training programs. Secondly, organizations can leverage these insights to develop inclusive strategies that harness technological advancements to enhance women's career opportunities. This may involve creating supportive work environments, promoting diversity in leadership roles, and implementing mentorship programs. Thirdly, educational institutions can integrate technology-related skills training into curricula, particularly for women pursuing careers in technology-driven fields. By doing so, they can help bridge the gender gap in STEM fields and prepare women for success in the digital economy. Lastly, raising awareness about the impact of technological integration on women's career trajectories and advocating for policies and practices that promote gender equity and inclusivity in the workplace can foster positive change. Additionally, further research in this area can stimulate ongoing efforts to create more equitable and diverse workplaces

SCOPE FOR FUTURE RESEARCH

Future research in this field could benefit from conducting longitudinal studies to track the evolving relationship between technological integration and women's career trajectories over time. By examining how these dynamics change over the years, researchers can gain a deeper understanding of the long-term effects of technology on gender disparities in the workforce. Additionally, comparative analyses across different industries or sectors could shed light on sector-specific challenges and opportunities for promoting gender equality. Furthermore, qualitative research methods such as interviews or focus groups could complement quantitative findings by capturing the nuanced perspectives and experiences of women in technology-driven environments. Exploring how factors such as race, ethnicity, socioeconomic status, and age intersect with gender and technological integration could also provide valuable insights into the unique challenges faced by women from diverse backgrounds.

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