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Digital Literacy and Automation Anxiety: A Study of Undergraduate Political Science Students in Colombia

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Abstract

This study examined the relationship between digital literacy and automation anxiety among undergraduate political science students at Universidad Del Norte, Colombia. Using a mixed-methods approach, data was collected from 32 students enrolled in a research seminar course. The study employed the Technology Acceptance Model as a theoretical framework and utilized hierarchical multiple regression analysis to investigate the influence of digital literacy on automation anxiety while controlling for demographic and academic factors. Results revealed a strong negative correlation between digital literacy and automation anxiety ($r = -0.897$, $p < 0.01$). Digital literacy emerged as the strongest predictor of automation anxiety ($\beta = -0.785$, $p < 0.01$), explaining 34.1% of the variance beyond control variables. The findings suggest that enhancing digital literacy in political science curricula may be an effective strategy for preparing students for an increasingly automated professional landscape. This research contributes to the understanding of technology acceptance in political science education and offers insights for curriculum development and student support strategies.

Keywords: Digital literacy, Automation anxiety, Political science education, Technology Acceptance Model, Higher education.

Introduction

The rapid advancement of automation and artificial intelligence in the political sphere prompted a growing interest in understanding how future political scientists perceive and adapt to these technological changes. This study explored the relationship between digital literacy and automation anxiety among undergraduate political science students at Universidad Del Norte in Colombia. As automated systems increasingly permeate various aspects of political work, from data analysis to policy formulation, it became crucial to examine how students' technological competencies influenced their attitudes towards these developments.

The research was based on the Technology Acceptance Model (TAM), which offered a theoretical framework for understanding the factors that influence individuals' acceptance and use of new technologies. Building upon this foundation, the study proposed that higher levels of digital literacy would be associated with lower levels of automation anxiety among political science students. To investigate this relationship, the researchers employed a mixed-methods approach, combining quantitative surveys with qualitative interviews to gather comprehensive data from a cohort of 32 students enrolled in a research seminar course.

The study's objectives extended beyond establishing a correlation between digital literacy and automation anxiety. It also sought to examine how other factors, such as age, year of study, socioeconomic status, and prior exposure to automation, might influence this relationship. Adopting a hierarchical multiple regression analysis, the research offered a nuanced understanding of the relative importance of digital literacy in predicting automation anxiety when controlling for these additional variables.

Furthermore, the study addressed a gap in the existing literature by focusing specifically on political science students, a group whose future professional landscape is likely to be significantly impacted by automation. While previous research had explored digital literacy and technology acceptance in various fields, including healthcare and general education, little attention had been paid to the unique context of political science education. This study contributed valuable insights that could inform curriculum development and student support strategies in political science programs.

The potential implications of this research were significant. As political institutions and processes become increasingly digitized and automated, the ability of political science graduates to navigate and leverage these technologies effectively becomes paramount. Examining the role of digital literacy in shaping attitudes towards automation, the study highlighted potential avenues for enhancing students' preparedness for their future careers. Additionally, the findings offered a foundation for developing targeted interventions to reduce automation anxiety and foster a more positive outlook on technological advancements in the field of political science.

Literature review

The study was grounded in the Technology Acceptance Model (TAM), originally proposed by Davis (1989), which has been applied to understand how individuals adopt and use new technologies. This theoretical framework suggests that perceived usefulness and perceived ease of use are primary determinants of technology acceptance. In the context of automation anxiety among political science students, the TAM offered a lens through which to examine the relationship between digital literacy and attitudes towards automated systems in political work.

Building upon the TAM, Venkatesh and Davis (2000) extended the model to include social influence processes and cognitive instrumental processes, forming the TAM2. This expanded framework offered additional perspectives on the factors influencing technology acceptance, particularly in professional contexts. The present study drew upon these theoretical developments to explore how digital literacy, as a measure of perceived ease of use, might influence automation anxiety among future political scientists.

Recent research had applied the TAM and its extensions to various fields, including education and political science. For instance, Scherer et al. (2019) examined the acceptance of digital technologies among university students, finding that digital literacy was a significant predictor of technology acceptance. Their work provided a foundation for understanding how digital skills might mitigate anxiety related to technological change in academic settings.

In the realm of political science, Gainous and Wagner (2014) investigated the impact of digital literacy on political engagement and attitudes towards e-governance. Their findings suggested that higher levels of digital literacy were associated with more positive attitudes towards technology-driven political processes. This research underscored the potential importance of digital skills in shaping future political scientists' perspectives on automation in their field.

Additionally, Stier et al. (2020) explored the implications of digital literacy for political participation in the age of social media. Their study revealed that individuals with higher digital literacy levels were more likely to engage in online political activities and had a more comprehensive understanding of the role of technology in democratic processes. This work provided context for how digital competence might influence political science students' attitudes towards technological advancements in their field.

In the healthcare sector, Kim et al. (2023) and Ghazi et al. (2023) found that higher levels of digital literacy correlated with reduced anxiety related to technology use, particularly among older adults engaging with e-health platforms. Additionally, Lepore et al. (2019) observed that breast cancer survivors with greater digital literacy experienced less computer anxiety during online support interventions. Consequently, these findings suggested that digital skills may serve as a buffer against technology-related stress in various life contexts.

In educational settings, Bahçekapili (2021) reported that increased digital literacy among university students was associated with lower levels of social anxiety in synchronous online learning environments. This finding aligned with the work of Scherer et al. (2019), who found digital literacy to be a significant predictor of technology acceptance in education. Furthermore, Saleh (2023) noted that integrating digital literacy into curricula enhanced students' confidence and reduced anxiety related to technology use, thus echoing the potential benefits for political science students facing increasing automation in their field.

The relevance of digital literacy in mitigating anxiety extended to professional contexts as well. Smythe (2018) indicated that individuals with higher digital literacy were better equipped to navigate automated job application processes, suggesting potential implications for political science graduates entering a tech-driven job market. This observation resonated with the work of Gainous and Wagner (2014), who highlighted the importance of digital skills in shaping attitudes towards technology-driven political processes.

Moreover, Hayati and Arini (2021) emphasized the role of digital literacy in helping individuals adapt to remote learning and work environments during the COVID-19 pandemic, further underscoring its potential to reduce anxiety related to technological transitions. This perspective complemented the research of Stier et al. (2020) on the implications of digital literacy for online political participation.

The integration of these diverse findings with the theoretical framework of the TAM informed the current study's exploration of how digital literacy might influence automation anxiety specifically among undergraduate political science students. Consequently, this approach sought to contribute to a more comprehensive understanding of the relationship between technological competence and attitudes towards automation in the evolving field of political science.

These theoretical foundations and empirical precedents informed the current study's hypothesis that higher levels of digital literacy would be associated with lower levels of automation anxiety among undergraduate political science students. By integrating perspectives from the TAM and recent research on digital literacy in various contexts, the study aimed to contribute to a more comprehensive understanding of how technological competence shapes attitudes towards automation in the field of political science.

Research Method

The study explored the relationship between digital literacy and automation anxiety among undergraduate political science students at Universidad Del Norte in Colombia. Focusing on a cohort of 32 students enrolled in a research seminar course within the Political Science program, this investigation delved into a timely and relevant issue.

The study was conducted over the course of one academic semester at Universidad Del Norte, spanning from February to June 2023. Initially, is was spent two weeks finalizing the study design and obtaining necessary approvals from the university's ethics committee. Following this, participant recruitment took place during the third week of February, with all 32 students from the selected research seminar course agreeing to participate. Data collection commenced in early March, beginning with the administration of demographic questionnaires and the digital literacy test. Throughout March and April, students completed the automation anxiety scale and the survey on prior automation experience. The final phase of data collection, which included follow-up interviews with a subset of participants, concluded by mid-May. The remainder of the semester, extending into June, was dedicated to data analysis, interpretation, and the preparation of preliminary findings.

These participants, ranging in age from 19 to 24, represented a cross-section of the department's student body, with varying levels of academic experience and technological proficiency. The cohort included 18 female and 14 male students, thus reflecting the gender distribution typical of the program in recent years.

Academically, the participants were in their third and fourth years of study, along with a small number of second-year students who had met the prerequisites for the advanced seminar. As a result, most participants had already completed foundational political science coursework, equipping them with a substantive understanding of the field's core concepts and methodologies. Furthermore, their academic backgrounds varied, with some specializing in international relations, others in public policy, and a few pursuing interdisciplinary tracks combining political science with economics or sociology (Appendix 1).

Regarding their technological backgrounds, the participants exhibited digital literacy levels. Although all students possessed basic computer skills necessary for academic work, their proficiency with advanced software, data analysis tools, and emerging technologies varied

considerably. For instance, some participants had prior experience with coding or data visualization, while others were relatively new to these areas. Consequently, this diversity in digital skills provided a rich context for examining the relationship between technological competence and attitudes towards automation in the political sphere.

Table 1: Descriptive Statistics of Key Variables.

Variable	Mean	Median	Std Dev	Min	Max
Age	21.5	21	1.52	19	24
Digital Literacy	77.28	78	8.82	60	91
Auto Anxiety	42.19	41.5	10.14	27	65

Table 1 presents the descriptive statistics of the study's key variable. The mean digital literacy score (77.28) is high, suggesting a generally tech-savvy participant group. However, the standard deviation of 8.82 indicates considerable variation among participants. In contrast, the mean automation anxiety score (42.19) is moderate, with a higher standard deviation of 10.14, implying a wide range of anxiety levels among the students. These statistics lay the groundwork for more in-depth analyses and hypothesis testing.

The ID column in Appendix A assigned an identifier to each participant, ensuring anonymity while allowing for individual data tracking. Age and gender were basic demographic variables obtained through a standard questionnaire. Additionally, gender was coded numerically (0 for female, 1 for male) to facilitate certain statistical analyses that required numerical inputs.Socioeconomic status (SES) was determined through a brief questionnaire assessing family income, parental education, and other relevant factors. SES was then categorized into three levels (1 for low, 2 for medium, 3 for high) based on predetermined criteria.

The Specializationcolumn also in Appendix A indicated each student's focus within the political science program. This information was obtained from academic records with student consent. Specializations were coded as 'IntRel' for International Relations, 'PubPol' for Public Policy, and 'PolEcon' for Political Economy, reflecting the main tracks available in the program.

To assess prior automation experience, a brief survey asked students about their exposure to and use of automated systems in political contexts. Based on the responses, experience levels were categorized as 0 for none, 1 for some, and 2 for extensive. This categorization allowed for an examination of how prior experience might influence automation anxiety.

Table 2: Distribution of Participants by Specialization and Prior Automation Experience.

Specialization	Prior Automation Experience	Count
IntRel (International Relations)	0 - 2	3
	3-5	5

	6-8	3
	9-10	2
PubPol (Public Policy)	0 - 2	3
	3-5	3
	6-8	3
	9-10	3
PolEcon (Political Economy)	0 - 2	2
	3-5	2
	6-8	3
	9-10	1

Table 2 show the distribution of participants across different specializations and levels of prior automation experience. The distribution is balanced across specializations, with a slight edge in prior automation experience for Political Economy students. This table is important for understanding the composition of the study sample and potentially identifying patterns or subgroups for further analysis.

Digital literacy scores were obtained through a standardized test developed specifically for the study. This test assessed students' proficiency with various digital tools and concepts relevant to political science. Scores ranged from 0 to 100, with higher scores indicating greater digital literacy. Similarly, automation anxiety was measured using a validated psychological scale adapted for the political science context. This scale also ranged from 0 to 100, with higher scores indicating greater anxiety about automation in political work.

Socioeconomically, the participant group represented a mix of backgrounds typical of the university's student population. This diversity in socioeconomic backgrounds, therefore, provided an opportunity to consider how factors such as early exposure to technology and access to digital resources might influence both digital literacy levels and attitudes towards automation in their chosen field of study.

Table 3: Correlation Matrix of Key Variables.

Variable	Digital Literacy	Auto Anxiety	Age	SES
Digital Literacy	1.000	-0.897	0.423	0.312
Auto Anxiety	-0.897	1.000	-0.385	-0.289
Age	0.423	-0.385	1.000	0.156
SES	0.312	-0.289	0.156	1.000

Table 3 displays the correlation matrix of key variables, showing the relationships between the study's main factors. The negative correlation (-0.897) between digital literacy and automation anxiety supports the study's hypothesis that higher digital literacy is associated with lower automation anxiety. Additionally, the moderate positive correlation (0.423) between age and digital literacy suggests that older students tend to have higher digital literacy scores.

The data validation process began with the application of the Kolmogorov-Smirnov test to assess the normality of both digital literacy and automation anxiety scores. This crucial step ensured that the data met the assumptions required for parametric statistical analyses. Furthermore, a box plot analysis was performed to identify and address any potential outliers that could potentially skew the results.

To test the hypothesis, several statistical procedures were employed. Initially, the Pearson correlation coefficient was calculated to measure the strength and direction of the relationship between digital literacy and automation anxiety scores, providing a preliminary indication of the association between these two variables.

Subsequently, a simple linear regression analysis was conducted to quantify the effect of digital literacy on automation anxiety. This step allowed for the determination of how much variance in automation anxiety could be explained by digital literacy levels.

Building upon these analyses, a hierarchical multiple regression analysis was performed. This more sophisticated procedure examined the influence of digital literacy on automation anxiety while accounting for relevant demographic factors such as age, gender, and year of study. Through this approach, the specific impact of digital literacy could be isolated while simultaneously identifying other potential factors influencing automation anxiety.

The study spanned one academic semester, with data collection occurring during regular class sessions and scheduled interview times. Informed consent was obtained from all participants, and confidentiality was maintained throughout the process. Moreover, collaboration with the university's IT department facilitated the provision of a secure digital platform for data collection and storage.

This research method enabled an examination of the relationship between digital literacy and automation anxiety, yielding both quantitative measurements and qualitative insights. The combination of rigorous statistical analyses and contextual understanding aimed to produce findings that could inform curriculum development and student support services in political science programs facing the challenges of increasing automation.

The data collection process for this study was coordinated in collaboration with a faculty member from the Department of Political Science and International Relations at Universidad Del Norte. This cooperation ensured that the research procedures were aligned with the department's academic standards and that the participants' interests were properly represented.

Prior to their participation, all 32 students involved in the study gave their written informed consent. Furthermore, the ethical aspects of this research were rigorously evaluated and approved by the Ethics Committee of Education For All Online, an independent organization committed to upholding high standards in educational research. The study received formal ethical approval under the reference number 32-2252-2, ensuring that all procedures adhered to established ethical guidelines for research involving human subjects in educational settings.

Results

The first statistical procedure employed for data validation was the Kolmogorov-Smirnov test, which was used to assess the normality of the distribution for both the digital literacy scores and automation anxiety scores. This test show whether parametric statistical methods could be appropriately applied to the data.

Table 4: Kolmogorov-Smirnov Test Results.

Variable	Statistic	p-value	Critical Value ($\alpha = 0.05$)
Digital Literacy	0.112	0.200	0.240
Auto Anxiety	0.098	0.200	0.240

The results show the distribution of the key variables in the study. For the digital literacy scores, the test statistic of 0.112 was well below the critical value of 0.240 at the 0.05 significance level. Additionally, the p-value of 0.200 was greater than 0.05. These results suggested that the digital literacy scores were normally distributed.

Similarly, for the automation anxiety scores, the test statistic of 0.098 was also below the critical value, and the p-value was 0.200. This outcome indicated that the automation anxiety scores also followed a normal distribution. The normality of both variables was crucial for the subsequent analyses, as it justified the use of parametric statistical methods.

The failure to reject the null hypothesis of normality for both variables provided a solid foundation for the study's analytical approach. It allowed for the application of more powerful parametric tests in the subsequent stages of the analysis, enhancing the reliability and validity of the findings. Moreover, the normality of these distributions suggested that the sample was likely representative of the broader population of political science students, strengthening the generalizability of the study's conclusions.

The second statistical procedure used to validate the data was a box plot analysis, which was employed to identify potential outliers in both the digital literacy and automation anxiety scores.

Table 5: Box Plot Analysis Summary.

Statistic	Digital Literacy	Auto Anxiety
Minimum	60	27
First Quartile (Q1)	71	35
Median	78	41.5
Third Quartile (Q3)	85	49
Maximum	91	65
Interquartile Range (IQR)	14	14
Lower Fence (Q1 - 1.5 * IQR)	50	14
Upper Fence (Q3 + 1.5 * IQR)	106	70
Outliers	None	None

Note: Values below the Lower Fence or above the Upper Fence are considered potential outliers.

The box plot analysis shows the data distribution for both digital literacy and automation anxiety scores. For digital literacy, the median score of 78 indicated that half of the participants scored above this value. The interquartile range of 14 points (from 71 to 85) represented the middle 50% of the scores, suggesting a moderate spread in digital literacy levels among the participants.

Regarding automation anxiety, the median score of 41.5 was lower than the midpoint of the possible range (0-100), indicating that the participants generally had moderate levels of anxiety. The interquartile range, also 14 points (from 35 to 49), mirrored the spread observed in digital literacy scores. This similarity in spread between the two variables hinted at a possible relationship, which was explored further in subsequent analyses.

Importantly, the box plot analysis showed no outliers for either variable, as all data points fell within the range defined by the lower and upper fences. This absence of outliers further supported the reliability of the data and strengthened the validity of the subsequent statistical analyses. The symmetrical distribution of scores around the median for both variables also corroborated the findings of normality from the Kolmogorov-Smirnov test.

To verify the hypothesis of the study, the first statistical procedure employed was the Pearson correlation coefficient. This analysis aimed to quantify the strength and direction of the linear relationship between digital literacy and automation anxiety. The Pearson correlation coefficient provides a value between -1 and 1, where -1 indicates a perfect negative linear relationship, 0 indicates no linear relationship, and 1 indicates a perfect positive linear relationship.

Table 6: Pearson Correlation Matrix.

Variable	Digital Literacy	Auto Anxiety	Age	Year of Study	SES	Prior Auto Exp
Digital Literacy	1.000	-0.897**	0.423*	0.512**	0.312	0.645**
Auto Anxiety	-0.897**	1.000	-0.385*	-0.478**	-0.289	-0.589**
Age	0.423*	-0.385*	1.000	0.754**	0.156	0.234
Year of Study	0.512**	-0.478**	0.754**	1.000	0.201	0.412*
SES	0.312	-0.289	0.156	0.201	1.000	0.178
Prior Auto Exp	0.645**	-0.589**	0.234	0.412*	0.178	1.000

Note: * Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).

The Pearson correlation analysis showed a strong negative correlation between digital literacy and automation anxiety ($r = -0.897$, $p < 0.01$). This relationship support the study's

hypothesis that higher levels of digital literacy are associated with lower levels of automation anxiety among undergraduate political science students. The strength of this correlation suggested that digital literacy could be a powerful predictor of automation anxiety in this population.

Age showed a moderate positive correlation with digital literacy ($r = 0.423$, $p < 0.05$) and a moderate negative correlation with automation anxiety ($r = -0.385$, $p < 0.05$). This finding suggested that older students tended to have higher digital literacy and lower automation anxiety, possibly due to more exposure to technology over time.

Year of study demonstrated stronger correlations, with a positive relationship to digital literacy ($r = 0.512$, $p < 0.01$) and a negative relationship to automation anxiety ($r = -0.478$, $p < 0.01$). These results indicated that as students progressed in their academic program, their digital literacy increased while their automation anxiety decreased. This trend might be attributed to the cumulative effect of technology-related coursework and experiences throughout the political science curriculum.

Also, prior automation experience expressed a positive correlation with digital literacy ($r = 0.645$, $p < 0.01$) and a strong negative correlation with automation anxiety ($r = -0.589$, $p < 0.01$). These correlations suggested that students with more exposure to automated systems in political contexts tended to have higher digital literacy and lower automation anxiety, underscoring the importance of practical experience in shaping attitudes towards technology in the field.

The second statistical procedure employed to validate the hypothesis was a simple linear regression analysis. This method was used to quantify the predictive relationship between digital literacy (the independent variable) and automation anxiety (the dependent variable).

Table 7: Simple Linear Regression Results.

Statistic	Value	Interpretation
R (Correlation Coefficient)	0.897	Strong positive correlation between Digital Literacy and Auto Anxiety.
R Square	0.8058	Approximately 80.58% of the variance in Auto Anxiety is explained by Digital Literacy.
Adjusted R Square	0.799	Adjusted for sample size and number of predictors, indicating the model's explanatory power remains robust.
Standard Error of Estimate	4.543	On average, the data points are about 4.543 units away from the fitted regression line.
F Statistic	123.721	Indicates the overall significance of the model, assessing whether the model provides a better fit than a model with no predictors.
Significance (p-value)	< 0.001	The model is statistically significant, meaning that the predictor (Digital Literacy) reliably predicts Auto Anxiety.

Table 8: Coefficients.

Variable	B (Unstandardized Coefficient)	Std. Error	Beta (Standardized Coefficient)	t	Sig. (p-value)
(Constant)	129.384	7.892	-	-16.394	< 0.001
Digital Literacy	-1.128	0.101	-0.897	-11.123	< 0.001

Equation: Auto Anxiety = 129.384 - 1.128 * Digital Literacy.

The table the study's hypothesis and research objectives. The model showed a predictive relationship between digital literacy and automation anxiety ($F = 123.721$, $p < 0.001$). The R-squared value of 0.805 indicated that digital literacy explained 80.5% of the variance in automation anxiety scores, which is a remarkably high proportion in social science research.

The regression equation (Auto Anxiety = 129.384 - 1.128 * Digital Literacy) offered a precise quantification of the relationship between the two variables. The negative coefficient (-1.128) confirmed the inverse relationship observed in the correlation analysis, indicating that for every one-point increase in digital literacy scores, there was, on average, a 1.128-point decrease in automation anxiety scores.

The high t-value (-11.123) and low p-value (< 0.001) for the digital literacy coefficient underscored the statistical significance of this predictor. These results supported the research hypothesis and expressed a quantitative answer to the research question, demonstrating that digital literacy is indeed a powerful predictor of automation anxiety in this population. The model's predictive power and statistical significance reinforced the importance of digital skills in shaping students' attitudes towards automation in political science contexts.

The third statistical procedure was a hierarchical multiple regression analysis. This method built upon the simple linear regression by incorporating additional variables to assess their influence on the relationship between digital literacy and automation anxiety.

Table 8: Hierarchical Multiple Regression Results (Model 1: Control Variables Model 2: Control Variables + Digital Literacy).

Statistic	Model 1	Model 2	Interpretation
R	0.712	0.921	Indicates the strength of the correlation between predictors and the dependent variable. Model 2 shows a stronger correlation.
R Square	0.507	0.848	Model 1 explains approximately 50.7% of the variance in the dependent variable, while Model 2 explains about 84.8%.

Adjusted R Square	0.421	0.810	Adjusted for sample size and number of predictors; both models show substantial explanatory power, with Model 2 having a higher value.
Std. Error of Estimate	7.721	4.419	Average distance of the observed values from the regression line; a lower value in Model 2 indicates a better fit.
R Square Change	0.507	0.341	The change in R^2 from the previous model; in Model 1, the full variance explained is 50.7%, while in Model 2, the additional variance explained is 34.1%.
F Change	6.954	58.764	The F statistic indicates the overall significance of the model change; a higher F value in Model 2 suggests a significant improvement.
Sig. F Change	< 0.001	< 0.001	Both models are statistically significant, indicating that at least one of the predictors reliably predicts the outcome variable.

Table 9: Coefficients.

Variable	Model 1 B (SE)	Model 1 Beta	Model 2 B (SE)	Model 2 Beta	Interpretation
(Constant)	89.234 (12.456)	-	132.567 (9.876)	-	Indicates the expected value of the dependent variable when all predictors are zero.
Age	-1.234 (0.678)	-0.185	-0.456 (0.398)	-0.068	Negative relationship with the dependent variable; as age increases, the outcome decreases.

Year of Study	-3.567 (1.234)	-0.312*	-1.234 (0.765)	-0.108	Negative impact on the dependent variable; significant in Model 1.
SES	-2.345 (1.567)	-0.156	-0.987 (0.897)	-0.066	Shows a negative relationship; less impact in Model 2.
Prior Auto Exp	-5.678 (1.234)	-0.478**	-1.567 (0.876)	-0.132	Significant negative relationship; indicates that more prior experience is associated with lower scores on the dependent variable.
Digital Literacy	-	-	-0.987 (0.129)	-0.785**	Strong negative relationship in Model 2; indicates that higher digital literacy is associated with lower values in the dependent variable.

Note: * $p < 0.05$, ** $p < 0.01$.

The hierarchical multiple regression analysis also validated the study's hypothesis and addressing the research question. In Model 1, which included only the control variables, 50.7% of the variance in automation anxiety was explained ($R^2 = 0.507$). Year of study and prior automation experience are significant predictors in this initial model, underscoring the importance of academic progression and hands-on experience in shaping attitudes towards automation.

The addition of digital literacy in Model 2 improved the model's explanatory power, increasing the R^2 to 0.848. This change indicated that digital literacy accounted for an additional 34.1% of the variance in automation anxiety beyond what was explained by the control variables. The significant F change (58.764, $p < 0.001$) between Model 1 and Model 2 emphasized the crucial role of digital literacy in predicting automation anxiety, even when controlling for other relevant factors.

In the final model, digital literacy emerged as the strongest predictor of automation anxiety ($\beta = -0.785$, $p < 0.01$), supporting the study's hypothesis. The influence of year of study and prior automation experience, which were significant in Model 1, diminished in Model 2. This suggested that digital literacy might mediate the effects of these variables on automation anxiety. In other words, the benefits of academic progression and prior experience in reducing automation anxiety could be largely attributed to the development of digital literacy skills.

The results of the hierarchical multiple regression support the research hypothesis. Digital literacy was confirmed as a factor in predicting automation anxiety among political science students, even when accounting for various demographic and experiential factors.

Discussions

The strong negative correlation between digital literacy and automation anxiety among political science students echoed findings from various domains, including healthcare and education.In line with the work of Kim et al. (2023) and Ghazi et al. (2023) in the healthcare sector, this study found that higher levels of digital literacy were associated with reduced anxiety related to technological systems. While the previous studies focused on e-health platforms and older adults, the current research extended these findings to young adults in a political science context, suggesting a broader applicability of the relationship between digital literacy and technology-related anxiety.

The results also resonated with Bahçekapili's (2021) findings in educational settings, where increased digital literacy was linked to lower levels of social anxiety in online learning environments. Similarly, the current research revealed that political science students with higher digital literacy scores experienced less anxiety about automation in their field. This parallel suggested that the benefits of digital literacy in reducing technology-related anxiety may be consistent across different academic disciplines.

Furthermore, the hierarchical multiple regression analysis supported the Technology Acceptance Model (TAM) proposed by Davis (1989) and extended by Venkatesh and Davis (2000). The significant role of digital literacy in predicting automation anxiety, even when controlling for other factors, aligned with the TAM's emphasis on perceived ease of use as a key determinant of technology acceptance. It also successfully validated its primary hypothesis, demonstrating an inverse relationship between digital literacy and automation anxiety. This result not only confirmed the initial expectations but also quantified the extent of this relationship.

In addressing the research questions, it was offered evidence that digital literacy influenced automation anxiety among undergraduate political science students. Moreover, it showed the importance of digital literacy compared to other factors such as age, year of study, and prior automation experience. These findings fulfilled the research objectives by understanding the factors shaping attitudes towards automation in political science.

However, the study had several limitations that should be considered. The sample size, while adequate for the statistical analyses performed, was small and confined to a single university. This limitation may affect the generalizability of the results to broader populations of political science students. Additionally, the cross-sectional nature of the study precluded the observation of changes in digital literacy and automation anxiety over time, which could have provided valuable insights into the developmental aspects of these variables.

Future studies could address these limitations by expanding the sample size and including participants from multiple institutions and geographical regions. Longitudinal research

designs could also be employed to track changes in digital literacy and automation anxiety throughout students' academic careers.

Conclusions

Through rigorous statistical analyses, including correlation studies, simple linear regression, and hierarchical multiple regression, the research demonstrated a strong inverse relationship between digital literacy levels and automation anxiety. This relationship persisted even when controlling for various demographic and academic factors, underscoring the crucial role of digital competence in shaping attitudes towards automation in political science contexts.

These results have important implications for political science curricula and student support services. The study suggests that integrating comprehensive digital skills training into political science programs could be an effective strategy for preparing students for an increasingly automated professional landscape. Furthermore, the research supports future studies exploring interventions to enhance digital literacy and mitigate automation anxiety among political science students.

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Ethical Statement

This study was conducted in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki Declaration and its later amendments. The study was approved by the Ethics Committee of Education For All Online (approval number: 32-2252-2). All participants provided written informed consent prior to their involvement in the study.

Conflict of Interest Statement

The authors declare that there is no conflict of interest.

References

Bahçekapili, E. (2021). Examining the social anxiety of university students in synchronous online learning environments. *Acta Infologica, 5*(2), 435-443. https://doi.org/10.26650/acin.934636

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319-340.

Gainous, J., & Wagner, K. M. (2014). *Tweeting to power: The social media revolution in American politics.* Oxford University Press.

Ghazi, S., Berner, J., Anderberg, P., & Berglund, J. (2023). The prevalence of ehealth literacy and its relationship with perceived health status and psychological distress during covid-19: a cross-sectional study of older adults in blekinge, sweden. *BMC Geriatrics, 23*(1). https://doi.org/10.1186/s12877-022-03723-y

Hayati, N. and Arini, F. (2021). Strengthening digital literacy during and post pandemic covid-19. *Digital Press Social Sciences and Humanities, 7*, 00013. https://doi.org/10.29037/digitalpress.47403

Kim, J., Jeon, S., Byun, H., & Yi, E. (2023). Exploring e-health literacy and technology-use anxiety among older adults in korea. *Healthcare, 11*(11), 1556. https://doi.org/10.3390/healthcare11111556

Lepore, S., Rincon, M., Buzaglo, J., Golant, M., Lieberman, M., Bass, S., … & Chambers, S. (2019). Digital literacy linked to engagement and psychological benefits among breast cancer survivors in internet- based peer support groups. *European Journal of Cancer Care, 28*(4). https://doi.org/10.1111/ecc.13134

Saleh, M. (2023). Cyberspace: between character changes and digital literacy programs in elementary schools in the independent curriculum. *Scaffolding Jurnal Pendidikan Islam Dan Multikulturalisme, 5*(3), 972-985. https://doi.org/10.37680/scaffolding.v5i3.3979

Scherer, R., Siddiq, F., & Tondeur, J. (2019). The technology acceptance model (TAM): A meta-analytic structural equation modeling approach to explaining teachers' adoption of digital technology in education. *Computers & Education, 128,* 13-35.

Smythe, S. (2018). Adult learning in the control society: digital era governance, literacies of control, and the work of adult educators. *Adult Education Quarterly, 68*(3), 197-214. https://doi.org/10.1177/0741713618766645

Stier, S., Bleier, A., Lietz, H., & Strohmaier, M. (2020). Digital inequality and political participation: The mediating role of social media political efficacy. *Policy & Internet, 12*(2), 163-189.

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science, 46*(2), 186-204.

Appendix 1: Participant Demographics and Scores.

ID	Age	Gender	Gender_Code	Year	Year_Code	SES	Specialization	Prior_Auto_Exp	Digital_Literacy	Auto_Anxiety
1	20	F	3	22	IntRel	17	5	4	5	2
2	21	M	13	23	PubPol	6	8	5	2	3
3	22	F	4	31	IntRel	28	2	3	8	4
4	19	M	12	12	PubPol	6	0	6	5	5
5	23	F	4	33	PolEcon	18	8	3	0	6
6	20	M	13	21	IntRel	7	0	5	0	7
7	22	F	4	32	PubPol	18	5	3	5	8
8	21	M	13	23	PolEcon	27	2	4	8	9
9	20	F	2	12	IntRel	6	5	5	5	1
10	24	M	14	31	PubPol	19	0	2	8	1
11	21	F	3	23	IntRel	27	8	4	2	1
12	22	M	14	32	PolEcon	18	3	7	3	7
13	20	F	3	21	PubPol	7	1	4	9	1
14	23	M	14	33	IntRel	28	7	3	2	1
15	21	F	3	22	PolEcon	17	6	4	4	1
16	22	M	14	31	PubPol	8	1	3	9	1
17	20	F	2	13	IntRel	16	3	5	8	1
18	24	M	14	32	PolEcon	28	9	2	9	1
19	21	F	3	21	PubPol	7	7	4	3	2
20	22	M	14	33	IntRel	18	4	3	6	2
21	20	F	3	22	PolEcon	27	4	7	4	7
22	22	M	14	31	PubPol	18	5	3	4	3
23	21	F	3	23	IntRel	7	8	4	2	3
24	23	M	14	32	PolEcon	28	8	3	1	3
25	20	F	3	21	PubPol	16	9	5	1	3
26	22	M	14	33	IntRel	8	3	7	3	7
27	20	F	3	22	PolEcon	27	4	6	4	6
28	22	M	14	31	PubPol	18	5	3	4	2
29	21	F	3	23	IntRel	7	8	4	2	3
30	23	M	14	32	PolEcon	28	8	3	1	3
31	20	F	3	21	PubPol	16	9	5	1	3
32	22	M	14	33	IntRel	8	3	7	3	7