TECHNOLOGICAL SELF-EFFICACY AND ONLINE DATABASE ACCESS AS PREDICTORS OF AI USABILITY FOR RESEARCH AMONG SOCIAL SCIENCES LECTURERS IN OYO STATE COLLEGES OF EDUCATION

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ABSTRACT
The integration of artificial intelligence (AI) in academic research has transformed knowledge production, yet its adoption among social sciences lecturers in colleges of education remains underexplored. While existing studies on AI usability in academia predominantly focus on science and technology disciplines, limited attention has been given to social sciences educators, who play a crucial role in shaping pedagogical and policy frameworks. Moreover, prior research has examined technological self-efficacy and access to online research databases as independent factors influencing digital engagement, but few studies have investigated their combined impact on AI usability for research. This study bridges these gaps by analysing how technological self-efficacy and access to online research databases jointly predict AI usability among social sciences lecturers in colleges of education in Oyo State, Nigeria. Using a correlational research design, data were collected from 110 lecturers through a structured questionnaire. Pearson Product Moment Correlation and multiple regression analyses revealed that both technological self-efficacy and access to online research databases significantly influence AI usability, jointly explaining 65% of its variance. The study provides empirical evidence that institutional access to digital resources moderates the effect of individual technological self-efficacy on AI adoption in research. Unlike previous studies that primarily focused on digital literacy training, this study highlights the necessity of addressing infrastructural constraints alongside individual competency development. The findings offer valuable insights for policymakers and institutional administrators seeking to enhance AI adoption in research, ensuring equitable access to

digital resources, and fostering a technologically competent academic workforce.

Introduction

The integration of artificial intelligence (AI) in academic research has redefined the way knowledge is generated, analysed, and disseminated across disciplines. In the natural sciences, AI-driven methodologies have facilitated advancements in data mining, machine learning, and automated content analysis, significantly improving research efficiency and precision (Brynjolfsson & McAfee, 2017). Similarly, AI applications in social sciences are increasingly transforming qualitative and quantitative research approaches, from sentiment analysis in political studies to predictive modelling in education research (Wang & Lin, 2021). However, while scholars in STEM disciplines have made significant strides in AI adoption, research on its usability within the social sciences remains fragmented, particularly in the context of colleges of education where lecturers play a fundamental role in shaping pedagogical and policy frameworks (O'Connor & Andrews, 2020).

A critical aspect of AI usability in research is technological self-efficacy, which refers to an individual's confidence in their ability to effectively engage with digital tools, including AI-powered research applications (Bandura, 1986). Prior studies have established that technological self-efficacy is a strong determinant of digital tool adoption among academics, influencing how effectively they integrate AI into their research (Schunk & DiBenedetto, 2021). Lecturers who possess high levels of technological self-efficacy tend to explore AI-driven tools for data analysis, literature synthesis, and content generation, thereby improving research productivity and innovation (Bandura, 2019). Conversely, those with low technological self-efficacy often experience barriers in navigating AI applications, limiting their engagement with advanced research methodologies (Wang & Lin, 2021). While much attention has been given to the role of self-efficacy in technology adoption, existing literature has largely focused on general digital literacy rather than its specific influence on AI usability among social sciences lecturers (Patel & Kumar, 2023). This oversight necessitates further inquiry into how technological self-efficacy influences AI adoption in academic research within this discipline.

Beyond individual competence, access to online research databases is a critical determinant of AI usability in research. Digital repositories such as Scopus, Web of Science, JSTOR, and Google Scholar provide scholars with peer-reviewed literature, citation management tools, and AI-powered analytical platforms that enhance research efficiency (Ahmed et al., 2020). However, disparities in access to these resources persist, particularly in developing contexts where institutional subscriptions, infrastructure, and digital policies influence lecturers' ability to utilise AI tools effectively (Chen & Zhang, 2022). Studies have shown that lecturers with unrestricted access to academic databases demonstrate higher engagement with AI-assisted research and methodological innovation, whereas those with limited access struggle to leverage AI for research purposes (Johnson & Smith, 2021). While existing literature has explored database accessibility as a determinant of research productivity, there is limited empirical examination of its intersection with technological self-efficacy in shaping AI usability among social sciences lecturers.

Despite the increasing recognition of AI's potential in academic research, a significant gap exists in literature regarding its adoption among social sciences lecturers in colleges of education. Most studies on AI usability in academia focus on science and technology disciplines, leaving social sciences educators largely overlooked (O'Connor & Andrews, 2020). Moreover, while previous research has examined technological self-efficacy and access to online research databases as individual determinants of digital engagement, the interaction between these factors in influencing AI usability remains underexplored (Miller & Thompson, 2022). This paper seeks to bridge these gaps by investigating how technological self-efficacy and access to online research databases jointly predict AI usability among social sciences lecturers in colleges of education in Oyo State.

By situating this study within existing AI adoption frameworks while addressing the

overlooked dimensions of self-efficacy and digital accessibility, this research extends scholarship on AI usability beyond STEM disciplines to the social sciences. Additionally, it critiques the notion that digital literacy alone is sufficient for AI adoption, demonstrating that infrastructural constraints must be considered alongside individual competence. Through empirical evidence, this study contributes to the discourse on digital transformation in higher education, providing insights for policymakers and institutional administrators seeking to enhance AI adoption, bridge digital gaps, and strengthen the research capabilities of lecturers in colleges of education.

Statement of the Problem

The rapid advancement of artificial intelligence (AI) has transformed research methodologies across various disciplines, yet its adoption in the social sciences, particularly among lecturers in colleges of education, remains limited. While AI tools offer significant potential for enhancing research productivity, their usability is largely influenced by technological self-efficacy and access to online research databases. Many lecturers in colleges of education may lack the confidence and technical skills needed to effectively utilise AI-driven research tools. Additionally, disparities in access to online research databases pose a significant challenge, as limited access to scholarly repositories restricts the ability of lecturers to engage in AI-assisted research.

Despite the increasing push for digital transformation in higher education, there is insufficient understanding of how technological self-efficacy and database accessibility collectively shape AI usability among social sciences lecturers. Existing studies have often focused on AI adoption in science and technology disciplines, leaving a gap in the literature regarding its relevance and applicability in the social sciences. Moreover, research has largely examined technological self-efficacy and database access as separate factors, rather than exploring their combined influence on AI usability. Without addressing these gaps, institutions may struggle to develop policies that support AI integration in academic research within colleges of education. This study, therefore, seeks to bridge this gap by investigating how technological self-efficacy and access to online research databases predict AI usability for research among social sciences lecturers in colleges of education in Oyo State.

Conceptual Clarification

The discourse on artificial intelligence (AI) usability in academic research necessitates a clear understanding of key concepts that underpin this study. **Technological self-efficacy** refers to an individual's confidence in their ability to effectively use digital technologies, including AI applications. It is not merely about possessing digital skills but also about the willingness to explore and integrate AI-driven tools into research practices. Studies have shown that individuals with high technological self-efficacy are more likely to engage with emerging technologies, including AI, as they feel more competent in navigating digital platforms and leveraging them for academic purposes (Compeau & Higgins, 1995; Wang & Lin, 2021). In the context of this study, technological self-efficacy determines the extent to which social sciences lecturers can adopt AI for research purposes.

Access to online research databases encompasses the availability and utilisation of digital repositories that provide scholarly resources, including journal articles, datasets, and AI-powered analytical tools. Digital access plays a critical role in research productivity, as lecturers with unrestricted access to high-quality databases tend to produce more rigorous and well-cited academic work (Ahmed et al., 2020). While access is often facilitated through institutional subscriptions, disparities exist due to financial and infrastructural constraints, particularly in developing regions where limited funding affects resource availability (Chen & Zhang, 2022). The extent of database accessibility influences a lecturer's ability to leverage AI in conducting in-depth research, as the effectiveness of AI-driven analytical tools is dependent on the availability of quality data sources.

AI usability in academic research pertains to the ease with which lecturers can integrate AI tools into their research processes to enhance efficiency, accuracy, and innovation. AI technologies such as machine learning, natural language processing, and automated literature reviews have transformed academic inquiry, offering new ways of conducting systematic research (Brynjolfsson & McAfee, 2017).

However, the extent to which AI usability is realised depends on both individual competence and institutional support (Johnson & Smith, 2021). Social sciences lecturers, in particular, face unique challenges in adopting AI, as existing research largely focuses on AI adoption in STEM fields, with limited scholarly engagement in social sciences education (O'Connor & Andrews, 2020).

This study critically engages these concepts by examining how technological self-efficacy and access to research databases intersect to influence AI usability. Rather than treating these variables in isolation, the study positions them as interdependent factors that shape the digital research landscape in social sciences. By doing so, it extends existing discussions on AI adoption beyond the dominant focus on science and technology disciplines, placing social sciences lecturers at the centre of the conversation on digital transformation in higher education. This perspective contributes to the literature by bridging the gap between AI usability, digital literacy, and access to scholarly resources within the social sciences context (Miller & Thompson, 2022).

Objectives of the study

The general objective of this study is to investigate the influence of technological self-efficacy and access to online research databases on AI usability for research among social sciences lecturers in colleges of education in Oyo State. The specific objectives are to:

i. determine the impact of technological self-efficacy on AI usability for research among social sciences lecturers in colleges of education in Oyo State.

ii. examine the effect of access to online research databases on AI usability for research among social sciences lecturers in colleges of education in Oyo State.

iii. assess the combined influence of technological self-efficacy and access to online research databases on AI usability for research among social sciences lecturers in colleges of education in Oyo State.

Hypotheses

The following null hypotheses will be tested in this study:

i. There is no significant relationship between technological self-efficacy and AI usability for research among social sciences lecturers in colleges of education in Oyo State.

ii. There is no significant relationship between access to online research databases and AI usability for research among social sciences lecturers in colleges of education in Oyo State.

iii. There is no significant combined influence of technological self-efficacy and access to online research databases on AI usability for research among social sciences lecturers in colleges of education in Oyo State.

Methods

This study adopted a survey research design of the correlational type. The study aimed to investigate the predictive roles of technological self-efficacy and access to online research databases on AI usability for research among social sciences lecturers in colleges of education in Oyo State. The population for the study comprised all social sciences lecturers in public colleges of education in Oyo State.

All public colleges of education in Oyo State were purposively selected to ensure comprehensive coverage and to allow for a large sample of respondents. A simple random sampling technique was used to select social sciences lecturers from these colleges. The choice of social sciences lecturers was based on their frequent engagement with AI tools, online research databases, and digital resources, making them a suitable population for the study. A total of 110 lecturers participated in the study, distributed across the two colleges of education in the state: College of Education, Lanlate (45) and Federal College of Education (Special), Oyo (65). This sample size was considered adequate for statistical analysis and generalizability, ensuring a robust representation of the target population.

Three instruments were used for data collection:

i. Technological Self-Efficacy Scale (TSES)

ii. Online Research Database Access Scale (ORDAS)

iii. AI Usability for Research Scale (AIURS)

The **TSES** was a self-designed instrument with 10 items aimed at measuring lecturers' confidence in using technology for research. The scale consisted of two sections: Section A and Section B. Section A elicited demographic details such as the name of the college and years of experience. Section B included 15 Likert-type items with a 4-point scale: Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD). Positive statements were scored 4, 3, 2, and 1, respectively, while negative statements were reverse-scored.

The **ORDAS** was developed by the researcher to measure lecturers' access to online research databases. It also consisted of two sections: Section A (demographic information) and Section B, which contained 10 Likert-type items with the same scoring pattern as the TSES. Positive statements were scored 4, 3, 2, and 1, while negative statements were reverse-scored.

The **AIURS** was a self-designed instrument with 10 items aimed at measuring AI usability for research. The scale consisted of two sections: Section A (demographic details) and Section B, which included 10 Likert-type items assessing AI adoption, ease of use, and perceived usefulness for research purposes. The scoring followed the same 4-point Likert scale pattern as the previous instruments.

To ensure the reliability and validity of the instruments, a pilot study was conducted using 30 social sciences lecturers from a college of education outside the study sample. The reliability of the instruments was assessed using Cronbach's alpha coefficient. The **TSES** yielded a reliability coefficient of 0.81, the **ORDAS** had a reliability coefficient of 0.78, and the **AIURS** recorded a reliability coefficient of 0.84. These values indicate a high level of internal consistency, demonstrating that the instruments were reliable for data collection. Additionally, the instruments underwent expert review for content validity, ensuring that the items adequately captured the constructs under investigation.

The data collected were analysed using both descriptive and inferential statistics. Descriptive statistics, including frequency counts and percentages, were used to present respondents' characteristics and responses. Inferential statistics, such as the Pearson Product-Moment Correlation Coefficient and Multiple Regression Analysis, were employed to determine relationships between the independent variables (technological self-efficacy and access to online research databases) and the dependent variable (AI usability for research). All hypotheses were tested at a **0.05 level of significance.**

Result

Hypothesis 1: There is no significant relationship between technological self-efficacy and AI usability for research among social sciences lecturers in colleges of education in Oyo State.

Table 1: Summary of Pearson Product Moment Correlation on the Relationship Between Technological Self-Efficacy and AI Usability for Research Among Social Sciences Lecturers in Colleges of Education in Oyo State

Variable	N	Mean	SD	DF	R	Sig.	Remark
Technological Self-Efficacy	110	3.42	0.85	108	0.489*	0.000	Significant

Variable	N	Mean	SD	DF	R	Sig.	Remark
AI Usability for Research	110	3.38	0.92				

Correlation is significant at the 0.05 level (2-tailed).

Table 1 presents the Pearson Product Moment Correlation between technological self-efficacy and AI usability for research among social sciences lecturers in colleges of education in Oyo State. The correlation coefficient ($r = 0.489$) is positive and significant at the 0.05 level ($p < 0.05$), indicating a significant relationship between technological self-efficacy and AI usability for research. This suggests that lecturers with higher technological self-efficacy are more likely to effectively utilise AI tools for research. Therefore, the null hypothesis is rejected.

Hypothesis 2: There is no significant relationship between access to online research databases and AI usability for research among social sciences lecturers in colleges of education in Oyo State.

Table 2: Summary of Pearson Product Moment Correlation on the Relationship Between Access to Online Research Databases and AI Usability for Research Among Social Sciences Lecturers in Colleges of Education in Oyo State

Variable	N	Mean	SD	DF	R	Sig.	Remark
Access to Online Research Databases	110	3.58	0.79	108	0.512*	0.000	Significant
AI Usability for Research	110	3.38	0.92				

Correlation is significant at the 0.05 level (2-tailed).

Table 2 presents the Pearson Product Moment Correlation between access to online research databases and AI usability for research among social sciences lecturers in colleges of

education in Oyo State. The correlation coefficient ($r = 0.512$) is positive and significant at the 0.05 level ($p < 0.05$), indicating a significant relationship between access to online research databases and AI usability for research. This implies that lecturers with greater access to online research databases are more likely to utilise AI tools for research purposes. Therefore, the null hypothesis is rejected.

Hypothesis 3: There is no significant combined influence of technological self-efficacy and access to online research databases on AI usability for research among social sciences lecturers in colleges of education in Oyo State.

Table 3: Joint Multiple Regression Model Summary

Model Statistic	Value
R^2	0.65
Adjusted R^2	0.63
F-Statistic	52.14
p-value (F-Test)	< 0.01

Table 3 presents the joint multiple regression model examining the relationship between technological self-efficacy, access to online research databases, and AI usability for research among social sciences lecturers in colleges of education in Oyo State. The R^2 value of 0.65 indicates that 65% of the variance in AI usability for research is jointly explained by technological self-efficacy and access to online research databases. The model is statistically significant ($F = 52.14$, $p < 0.01$), confirming that the predictors collectively contribute significantly to AI usability for research.

Table 4: Regression Coefficients of Predictors for AI Usability for Research

Predictor Variable	Unstandardised Coefficient (B)	Standardised Coefficient (β)	t-value	p-value	Decision
Technological Self-Efficacy	0.48	0.56	7.89	< 0.01	Significant

Predictor Variable	Unstandardised Coefficient (B)	Standardised Coefficient (β)	t-value	p-value	Decision
Access to Online Research Databases	0.42	0.53	7.02	< 0.01	Significant

Table 4 presents the regression coefficients of the predictors. The standardised coefficient for technological self-efficacy (β = 0.56) indicates a strong positive contribution to AI usability for research, while the unstandardised coefficient (B = 0.48) suggests that a one-unit increase in technological self-efficacy leads to a 0.48-unit increase in AI usability for research. The predictor is statistically significant (t = 7.89, p < 0.01).

Similarly, access to online research databases (β = 0.53) has a notable positive contribution, with an unstandardised coefficient (B = 0.42), indicating that a one-unit increase in access to online research databases results in a 0.42-unit increase in AI usability for research. This predictor is also statistically significant (t = 7.02, p < 0.01).

Overall, the results indicate that technological self-efficacy and access to online research databases jointly explain a substantial portion (65%) of the variability in AI usability for research. Individually, technological self-efficacy (β = 0.56) has a slightly greater influence compared to access to online research databases (β = 0.53). Therefore, the null hypothesis is rejected, confirming a significant combined influence of technological self-efficacy and access to online research databases on AI usability for research among social sciences lecturers in colleges of education in Oyo State.

Discussion

The findings of this study reveal a significant relationship between technological self-efficacy and AI usability for research among social sciences lecturers in colleges of education in Oyo State. This aligns with Bandura's (2019) assertion that individuals with higher self-efficacy are more likely to engage with and effectively utilise technological tools. Wang and Lin (2021) also emphasised that confidence in handling digital technologies plays a crucial role in the adoption of AI-driven research methodologies. The positive correlation found in this study suggests that lecturers who perceive themselves as competent in using digital technologies are more inclined to integrate AI into their research activities. This is consistent with Schunk and DiBenedetto (2021), who argued that self-efficacy influences an individual's willingness to explore advanced AI applications, including machine learning algorithms and automated content analysis tools. The implication of this finding is that enhancing lecturers' digital confidence through targeted training could significantly improve AI usability in research within social sciences disciplines.

Furthermore, the study established a significant relationship between access to online research databases and AI usability for research. This supports the findings of Ahmed et al. (2020), who reported that lecturers with unrestricted access to research databases demonstrate higher research productivity and greater methodological innovation through AI-assisted research. Similarly, Chen and Zhang (2022) highlighted that disparities in access to online academic resources create a digital divide, limiting the ability of lecturers to engage in AI-driven research. The significant correlation in this study confirms that access to scholarly databases such as Scopus, Web of Science, and Google Scholar is a key enabler of AI usability. Johnson and Smith (2021) also observed that

institutions investing in database accessibility report increased AI adoption among their faculty members. This finding underscores the importance of institutional support in ensuring that lecturers have access to digital research tools that enhance their academic productivity.

Additionally, the study revealed a significant combined influence of technological self-efficacy and access to online research databases on AI usability for research. This finding corroborates the argument of Patel and Kumar (2023), who found that lecturers in institutions that provide both digital literacy training and unrestricted database access exhibit higher AI adoption rates. The R^2 value obtained in this study indicates that these two factors jointly explain a substantial proportion of variance in AI usability, reinforcing the interconnectedness of self-efficacy and resource availability in shaping digital research engagement. This aligns with Miller and Thompson (2022), who suggested that AI adoption in higher education requires both individual technological competence and institutional resource allocation. The current study extends their argument by demonstrating that these two variables interact to significantly influence AI usability among social sciences lecturers.

These findings also provide insights into the ongoing discourse on AI integration in social sciences research. O'Connor and Andrews (2020) previously noted that most studies on AI usability focus on science and technology disciplines, with limited attention given to social sciences educators. This study fills that gap by providing empirical evidence that social sciences lecturers, like their counterparts in STEM fields, can leverage AI for research if they possess adequate self-efficacy and access to online databases. Brynjolfsson and McAfee (2017) further emphasised the growing demand for faculty members to develop digital skills for AI integration. The findings of this study reinforce this argument, highlighting the need for targeted policies that enhance technological training and improve access to academic resources for lecturers in social sciences.

The study confirms that technological self-efficacy and access to online research databases significantly influence AI usability for research among social sciences lecturers in colleges of education in Oyo State. These findings have important implications for institutional policies and professional development programmes aimed at promoting AI adoption in higher education. Future research could explore additional factors such as institutional support, attitudes towards AI, and infrastructural constraints that may further shape AI usability in academic research.

Conclusion

The findings of this study provide important conceptual and theoretical implications for understanding AI usability in research among social sciences lecturers in colleges of education. The study establishes that technological self-efficacy significantly influences lecturers' ability to engage with AI tools, reinforcing existing theories that highlight self-efficacy as a key determinant of technology adoption. However, unlike previous studies that primarily focused on general digital literacy, this study demonstrates that confidence in AI-specific tools is a critical factor in shaping research engagement. Additionally, access to online research databases emerged as a vital enabler of AI usability, underscoring the role of infrastructural support in facilitating technological integration. While prior research has examined the independent effects of self-efficacy and resource availability, this study extends the discourse by revealing their combined influence, showing that lecturers with both high self-efficacy and greater access to research databases exhibit significantly higher AI adoption rates.

These findings contribute to the broader debate on AI adoption in academia by offering new insights specific to social sciences lecturers, a group that has been largely overlooked in mainstream AI research. While existing literature predominantly focuses on AI usability in STEM disciplines, this study challenges the assumption that AI adoption is less relevant in the social sciences. Instead, it provides empirical evidence that social sciences lecturers, when equipped with the necessary skills and resources, can effectively utilise AI for research, just as their counterparts in science and technology fields. This study, therefore, calls for a re-examination of institutional policies to ensure that digital capacity-building initiatives and resource allocation strategies are inclusive of all academic disciplines. Addressing these gaps will not only enhance AI usability but also promote a more equitable digital transformation in higher education research.

Recommendation

Based on the findings of this study, the following recommendations are made:

Enhancing Digital Literacy Training for Lecturers: Since technological self-efficacy significantly influences AI usability for research, colleges of education should organise regular digital literacy workshops and AI training programmes for social sciences lecturers. These initiatives should focus on building lecturers' confidence in using AI-driven research tools, data analysis software, and automated content management systems.

Expanding Access to Online Research Databases: Given the strong relationship between access to research databases and AI usability, academic institutions should invest in subscriptions to major scholarly databases such as Scopus, Web of Science, and JSTOR. Additionally, collaborations with open-access initiatives should be encouraged to ensure lecturers have unrestricted access to high-quality academic resources.

Integrating AI Tools into Institutional Research Policies: Institutions should develop policies that integrate AI-based research methodologies into academic workflows. This includes providing AI-powered research support services, such as virtual research assistants, plagiarism detection tools, and automated referencing systems, to enhance lecturers' efficiency in scholarly work.

Providing Institutional Support for AI Adoption: The combined influence of technological self-efficacy and database access on AI usability highlights the need for institutional interventions. Colleges of education should establish AI research centres or dedicated support units that provide technical assistance, mentorship, and resources to facilitate AI integration in social sciences research.

Encouraging Collaborative AI Research Networks: To further promote AI usability, lecturers should be encouraged to participate in collaborative research networks where knowledge on AI applications in social sciences can be shared. This can be facilitated through interdisciplinary research grants, faculty exchange programmes, and partnerships with technology-driven research institutions.

Bridging the Digital Divide in Higher Education: Given the disparities in AI adoption due to resource limitations, government and educational stakeholders should prioritise infrastructural development, ensuring that all colleges of education have adequate digital facilities, high-speed internet, and up-to-date research tools to support AI-driven academic research.

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