Journal of Literacy and Technology
Volume 26, Number 3: Fall 2025
ISSN: 1535-0975

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Volume 26, Number 3: Fall 2025
ISSN: 1535-0975


# Global Leadership and Artificial Intelligence (AI) Literacies: A Fulbright Perspective

Eileen N. Whelan Ariza & Meredith Mountford
Florida Atlantic University

## Abstract

This article is based on an invited dinner presentation delivered at the 2025 Annual Convention of the University Council for Educational Administration (UCEA) in San Juan, Puerto Rico. As a Fulbright Alumni Ambassador, appointed by the U.S. Department of State, which oversees the Fulbright Program, Ariza examines how the Fulbright Program can serve as a leadership framework for educational administrators navigating artificial intelligence (AI), digital literacies, and multilingual communication opportunities abroad. Using qualitative narrative analysis grounded in Ariza's Fulbright appointments in Mexico, Costa Rica, and Malta, as well as her role as Fulbright Alumni Ambassador and reviewer of hundreds of Fulbright proposals, the paper integrates firsthand reflections with peer-reviewed research and international policy guidance. We argue that immersive global experiences cultivate intercultural competence, strategic vision, and ethical reflexivity, capacities essential for AI-inflected decision-making and digital equity work. Drawing on guidance from UNESCO and the U.S. Department of Education, as well as established scholarship in digital literacy, we propose design principles, mentoring practices, and programmatic recommendations for administrator preparation programs. We further illustrate how country-level policies (e.g., Estonia's AI Leap) offer concrete models for preplanned human-centered implementation. The article concludes with tools that administrators can adapt, suggestions for proposal design, readiness checklists, and evaluation indicators, to ensure that AI and digital initiatives are inclusive, sustainable, and linguistically responsive.

**Keywords**: artificial intelligence, digital literacies, educational administration, Fulbright Program, global leadership, intercultural competence, multilingual education

## Introduction

Artificial intelligence is not just reshaping educational administration; it's fundamentally altering how leaders allocate resources, communicate, evaluate programs, and support teaching and learning. In this context, effective administrators require three interdependent literacies: digital literacy (access, analysis, creation), AI literacy (understanding, use, evaluation, and ethics), and intercultural-linguistic literacy (working across languages and cultures with humility). (Digital Promise, 2024; UNESCO, 2023; Warschauer & Matuchniak, 2010). (Digital Promise, 2024; UNESCO, 2023; Warschauer & Matuchniak, 2010). Research bodies increasingly call for human-centered, transparent, and equitable approaches to AI in education, providing reassurance that the ethical considerations in AI integration are at the forefront. At the same time, digital access and infrastructure remain uneven across regions, requiring context-sensitive planning and phased implementation.

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By placing educators and administrators in different national systems, the Fulbright Program offers a practical and invaluable pathway for developing these literacies. Through Ariza's Fulbright experiences in Mexico (2009), Costa Rica (2016), and Malta (2018), we consider how global immersion strengthens leaders' ability to design inclusive, feasible, and culturally aware technology strategies.

## Theoretical and Conceptual Framework

Our framework draws from three strands. First, the digital literacy tradition emphasizes critical engagement and production in multimodal environments (Warschauer & Matuchniak, 2010). Second, emerging AI-literacy frameworks highlight the need for explainability, fairness, data protection, and human oversight (UNESCO, 2021, 2023; U.S. Department of Education, 2023). Third, scholarship on internationalization suggests that immersive cross-cultural experiences develop the adaptive expertise needed to implement technology responsibly. Together, these strands suggest that leadership for AI and digital initiatives must be ethical and intercultural in addition to being technical.

### Methodological Note

In a narrative synthesis, Ariza's firsthand reflections from three Fulbright appointments are interwoven with policy documents, official information from the Fulbright site, and her experience as a panelist reviewer for hundreds of Fulbright applicants. These narrative episodes not only illustrate how context and culture influence decisions but also provide practical guidance for administrators, mentors, applicants, and reviewers. This guidance equips them with the necessary tools to navigate the challenges of AI integration, ensuring they are well-prepared and confident in their roles.

## Fulbright as an International Pathway for Educational Administrators

Currently, the most ubiquitous topic for investigation abroad pertains to the international uses and policies of Artificial Intelligence (AI). The Fulbright network offers multiple entry points for educational administrators to travel abroad. International Education Administrators (IEA) seminars provide short, cohort-based visits to understand host systems and explore collaborative opportunities with administrators in other countries. Several types of awards are available for administrators, which can be beneficial for participants who wish to gain international experience, especially in the short term. Teaching and research awards foster sustained engagement within host institutions. Specialist awards facilitate short, project-based consultancies tailored to the specific needs of institutions. These formats expose leaders to infrastructure, policy, and language constraints that shape digital innovation in other countries. Such experiences are critical for all educational administrators, given the challenges related to AI implementation and policy formation at each district level. Artificial intelligence is increasingly being integrated into education through adaptive learning platforms, administrative automation, generative tools, analytics dashboards, and other applications. Developments like these promise to transform instructional practice, administrative efficiency, and decision-making. However, for educational administrators in Fulbright programs, integrating AI involves more than simply selecting a new tool. It requires

navigating complex systemic, ethical, and policy-oriented challenges. **Ariza's Fulbright Reflections**

In Mexico (2009), Ariza taught graduate Teachers of English as a Foreign Language (TEFL) courses at the Universidad de las Americas in Puebla, in an environment with inconsistent electricity and classroom connectivity. The access to technology was unpredictable, at best. She resorted to focusing on offline pedagogy in the classroom and on access to the language lab. This experience reshaped her thoughts on evaluating technology plans within Fulbright applications being reviewed, as reliability and feasibility often outweigh the reality of available technology. These experiences with proposal reviews allow insight into bridging the gap between educational administrators who seek to apply for the dedicated Fulbright awards and encourages them to suggest more realistic components of the Fulbright proposals for this specific community.

In Costa Rica (2016), at the Universidad de San Jose, Ariza developed and led multilingual literacy workshops, conference style, for Costa Rican English teachers and professors of English as a Foreign Language (EFL). She invited 10 colleagues from the United States to present strategies in their specialized content areas for English learners, teachers, and professors in a coordinated, cross-institutional collaboration with the Ministry of Education. She learned that successful digital projects require explicit agreements about platforms, data handling, and language access. Digital partnerships are most effective when they complement existing networks and cultural practices. Technology in the classroom was also quite limited, as only certain rooms offered Internet connections. The students who had smartphones used them for language practice and shared them with students who did not have phones. Coupled with poor acoustics, access to rooms and technology was severely restricted.

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In Malta (2018), Ariza presented on multilingual/multicultural teaching in migration-affected classrooms. Translation technologies were helpful but limited, and often the language to be translated was not available or accessible. Pedagogical design and teacher preparation remained central to the process. Digital tools served the goals of linguistic inclusion as defined by educators and communities.

**Comparative Policy Illustrations in Other Countries**

Each country has its own policies and beliefs regarding the use of technology and AI. For example, Estonia's AI Leap 2025 emphasizes phased student access and teacher training within a national strategy (Education Estonia, 2025). China's Strategic Action Plan integrates AI across schooling with a focus on critical thinking and talent development (Ministry of Education of China, 2025). The U.S. Department of Education calls for human-centered design, transparency, and inclusive engagement (U.S. Department of Education, 2023). Finland's AI Guidelines prioritize ethical innovation and digital competence (Ministry of Education and Culture, Finland, 2023). Brazil is drafting national AI guidelines with public consultation and risk-based rules (Valor International, 2025). Successful implementations pair policy clarity with staged pilots, professional learning, and multilingual sensitivity (Education Estonia, 2025; UNESCO, 2023; U.S. Department of Education, 2023). School leaders must be aware of the various AI policies globally, including their similarities

and differences, as well as effective AI policies. Showing awareness about this type of knowledge suggests that the candidate will make an easier transition into a new culture.

**Digital and AI Literacies for Leadership**

Digital literacy involves multimodal authorship, critical evaluation, and collaborative problem-solving (Erwin & Mohammed, 2022). AI literacy extends this stance, and leaders should understand how AI systems work, set guardrails and parameters, evaluate output, and anticipate bias. Policy bodies recommend transparency, explainability, and human oversight (UNESCO, 2023). Administrators should implement staff development, auditability, and channels for stakeholder feedback within educational settings.

This implementation guide outlines a staged approach for Fulbright-informed AI/digital initiatives, particularly those emerging from international education, cultural exchange, or capacity-building contexts. It is designed to help institutions, ministries, and educators integrate AI and digital tools responsibly in ways that respect local values, promote equity, and ensure sustainability. These aspects are crucial to writing a successful proposal because they demonstrate an understanding of multicultural viewpoints.

OECD (2023) and Digital Promise (2024) provide guidance on how to refine current approaches for Fulbright-informed AI/digital initiatives. Johnson (2020) and MAEC (2021) also include the following objectives for equity implementation:

> **Readiness and Equity Audit**: Evaluations include policies and practices that recognize inequities and readiness for change.
> **Purpose and Fit**: The initiative must align with the institution's mission and needs.
> **Co-Design and Consent**: All stakeholders should be involved in shaping the initiatives.
> **Phased Pilots**: Changes are made gradually.
> **Professional Learning**: Ongoing training and support are offered to all participants.
> **Monitoring and Recourse**: Tracking and evaluation procedures are incorporated into the program.
> **Sustainability and Handover**: The program's viability is maintained through ongoing impact beyond the initial stages.

Each phase ensures that initiatives are inclusive, feasible, and responsive to local conditions (OECD, 2023; Digital Promise, 2024).

**Mentoring Administrators for Fulbright Success**

The dedicated Fulbright programs designed for administrators are called International Education Administrators Program (IEA) seminars. Fulbright program assistants provide support for administrators planning to submit proposals in cross-border collaboration. Upcoming opportunities for IEA programs include Japan and South Korea (June 2026), as well as France, Germany, and India (February 2026), along with the HBCU IEA Seminar in France and Senegal. These two-week programs promote diversity, equity, and global leadership. Mentors from the

Fulbright program and previous participants can guide applicants during proposal development by suggesting approaches that have worked, utilizing knowledge gained from their own successful applications, or by providing tips learned from their involvement in the proposal review process.

**Points and Key Features about the Fulbright IEA Seminar Programs**

**Audience:**
U.S. university administrators, deans, directors of international programs, and senior staff involved in global education strategy are participants in these seminars.

**Duration:**
Each seminar lasts 2 weeks in the selected country.

**Purpose**:

- Learn about the host country's higher education system
- Exchange best practices with international colleagues
- Explore potential partnerships and collaborations
- Raise the profile of the home institution abroad

**Activities in the IEA Seminar Programs**:

- American administrators make campus visits across a range of institutions in the host country.
- American participants are involved in briefings with government officials, faculty, and education experts.
- Cultural site visits and networking events promote interactions between Americans and host
- participants.

**Funding:** Fulbright covers round-trip airfare, in-country travel, lodging, and a stipend for incidentals. Candidates can find individual information for each host country at https://fulbrightscholars.org/us-scholar-awards/IEA

**Application Strategies**

IEA Fulbright programs are particularly competitive and are geared towards selecting administrators who have little to no previous experience abroad. To be sure the proposal aligns with the needs of the country, successful Fulbright applications should include:
**Institutional Fit:** Ensure the proposal aligns with the institution's needs.

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- **Strategic Relevance**: Ensure the proposal is appropriate for the program.
- **Cultural Humility**: Focus on what you can offer the country and host institutions.
- **Digital and AI Dimension**: Understand and comply with the country's policies.
- **Narrative Clarity**: Ensure your narrative has objectives that can be achieved.

Applicants should consult the Fulbright U.S. Scholar Awards Catalog for current deadlines and program details, including information about current awards, deadlines, eligibility criteria, and country-specific opportunities. Here is the official URL for the Fulbright U.S. Scholar Awards Catalog: https://fulbrightscholars.org/awards/search

**Expanding Opportunities Beyond IEA**

Administrators may also explore the Fulbright Specialist Program, Fulbright Scholar Awards, Fulbright Distinguished Scholar Awards, Fulbright Alumni Initiatives, and Global Scholar Awards. Each category supports leadership and internationalization. The administrator program is the shortest and seeks candidates with limited or no international experience. The Specialist Program is a short-term program, ranging from a few weeks to a few months, and prefers candidates who have some international experience, allowing them to make a quick adaptation to the country. The Fulbright Scholar awards are for one semester or the full academic year. Since the time spent overseas is longer, reviewers also try to select candidates who have limited experience abroad.

**Ariza's Mentoring Insights**

As mentioned, Ariza's role as a Fulbright Scholar, reviewer, and Fulbright Ambassador nominated by the state department to represent Fulbright in national speaking engagements, she has evaluated hundreds of Fulbright proposals. She recommends integrating intercultural reflection during proposal reviews. An important suggestion she gives participants is to first research the country of interest. Determine the country's needs and then align your (the candidate's) strengths with these needs to match the potential opportunity most effectively. During the proposal preparation stage, she encourages the participant to use the preferred language embedded in the Fulbright pages and incorporate ethics that align with the association's goals. Finally, applicants must provide a clear articulation of the cross-cultural collaboration expected to occur as a result of the exchange.
When reading candidates' proposals, Ariza considers digital portfolio development and other technological opportunities during the evaluation process. During proposal preparation, skilled mentoring can help applicants align their proposals, embed ethics, and preview potential cross-cultural collaborations. Researching the host country's needs and aligning them with what the candidate can offer is a winning strategy for proposal selection.

**Assessment of the Proposal and Evidence of Potential Impact**

Administrators should gather implementation indicators such as training participation, platform adoption, language accommodations, data compliance, and outcome indicators that include engagement, equity, and multilingual responsiveness. Measurement should be fair, locally triangulated, and culturally valid (ETS, 2024; UNESCO, 2021). Consider what impact you and your Fulbright will have on the host country, as well as what impact will be made upon your return to your home country. In addition, consider what long-term impact and implications will be made, as you think about how you can foster greater returns on your Fulbright experience. These impacts could include research collaboration and publication with colleagues in the host country, invitations to your home country institutions, joint grant proposals, cross-campus curriculum development, virtual exchange programs, co-authored conference presentations, institutional

memoranda of understanding (MOUs), and sustained mentoring relationships that influence policy, pedagogy, and leadership practice across borders.

### Ethical AI Implementation in Multilingual Educational Contexts

UNESCO (2023) advises that any suggested technology or AI policies must ensure transparency, data protection, bias auditing, and language accommodations. Translation tools must be vetted for appropriate cultural nuance, and leaders must plan for continuity in the face of shifting conditions. These safeguards are especially critical in multilingual and migration-affected contexts, where algorithmic decisions may inadvertently reinforce exclusion or misinterpret cultural nuance. Administrators must ensure that AI tools are not only technically sound but also linguistically inclusive and ethically aligned with community values. These steps include screening translation platforms for dialect sensitivity, ensuring human oversight in automated decision-making, and budgeting for long-term support and retraining (Education Estonia, 2025; UNESCO, 2023; U.S. Department of Education, 2023). Ultimately, UNESCO emphasizes that the development of ethical AI in education necessitates ongoing monitoring, stakeholder engagement, and adaptable governance structures (UNESCO, 2023).

### Recommendations for Administrator Preparation Programs

Preparation programs should include the following steps for best practices:

- Embed Fulbright-inspired modules.
- Require coursework in AI literacy and multilingual leadership.
- Build virtual exchange partnerships.
- Provide lab-based pilot experiences.
- Formalize mentoring pipelines.

(UNESCO, 2023; U.S. Department of Education, 2023; Warschauer & Matuchniak, 2010).
These steps move beyond access toward equitable sociotechnical systems (Warschauer & Matuchniak, 2010).

## Limitations and Future Research

This article presents a narrative-conceptual synthesis based on the personal experiences of a Fulbright scholar who has received and evaluated multiple awards. Future research should include comparative case studies of Fulbright alums leading AI/digital initiatives, design-based research on multilingual AI integration, and mixed-methods evaluations of administrator preparation models. Cross-regional studies would clarify how infrastructure and policy mediate adoption trajectories.

## Conclusion

Fulbright experiences equip educational administrators with a valuable intercultural perspective, diverse points of view, strategic sensibility, and ethical grounding necessary for leadership in the

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AI era. When paired with global policy guidance and digital-literacy scholarship, these experiences yield design principles that prioritize equity, linguistic inclusion, transparency, and sustainability. The result is not a universal blueprint but a way of leading by being attentive to context, rigorous about evidence, and committed to human-centered innovation. As AI continues to shape educational systems worldwide, leaders who combine technical fluency with cultural humility will be best positioned to ensure that digital transformation serves all learners. (UNESCO, 2023; U.S. Department of Education, 2023; Warschauer & Matuchniak, 2010; Fulbright Program, n.d.).

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**Acknowledgments**

The authors gratefully acknowledge the support of the Fulbright Program, which made the international experiences and collaborations described in this article possible. Eileen N. Whelan Ariza's Fulbright appointments in Mexico, Costa Rica, and Malta provided invaluable opportunities for intercultural engagement, leadership development in education, and scholarly reflection. These experiences deeply informed the conceptual framework and practical recommendations presented here. We also thank the host institutions and colleagues abroad who contributed to the success of these exchanges and enriched our understanding of global educational contexts.

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# Establishing the Literacy Educators' Attitudes and Perspectives on Artificial Intelligence (LEAP-AI) Scale: Teacher Perceptions on Protectionism, Empowerment, and Preparedness

**Sam von Gillern**
University of Missouri
svongillern@missouri.edu

**Amy Hutchison**
University of Alabama
achutchison1@ua.edu

**Chad Rose**
University of South Carolina
chadrose@sc.edu

**Nicholas Gage**
WestEd
ngage@wested.org

## Abstract

Artificial intelligence (AI) technologies are transforming the educational landscape. The concept of AI literacy has emerged in recent years with calls for researchers, educators, and students to develop their understanding of and ability to effectively navigate and utilize AI technologies in various educational contexts. Literacy teachers will likely play a substantial part in supporting students' AI literacy development given their central role in support students' digital literacy skills. Given that teachers' perceptions of technologies influence if and how these technologies are integrated into their teaching, it is valuable to investigate literacy teachers' perceptions on AI. This study surveyed 1,045 literacy teachers from around the United States to investigate these issues. A theory-driven confirmatory factor analysis led to the development of the Literacy Educators' Attitudes and Perceptions on Artificial Intelligence (LEAP-AI) Scale as a reliable and valid 24-item six-factor model. Factor constructs include 1) teacher understanding: protectionism, 2) teacher understanding: empowerment, 3) teacher teaching: protectionism, 4) teacher teaching: empowerment, 5) student understanding: protectionism, and 6) student understanding: empowerment. Additional analyses illustrate that literacy teachers have received limited support from their schools to deal with AI-related issues in their teaching and do not feel well-prepared to utilize AI tools for personal or educational purposes. Regression analyses demonstrate a trend in which teachers who feel better prepared to use AI rated empowerment factors more highly and less prepared teachers rated protectionism factors more highly. Implications and directions for future research are discussed.

**Keywords:** *artificial intelligence, literacy education, English language arts, teacher perspectives*

## Introduction

The topic of Artificial Intelligence (AI) literacy is rapidly being introduced, explored, and studied in both research literature and mainstream media (e.g., Casal-Otero et al., 2023; Long & Magerko, 2020; Martin et al., 2024). Yetisensoy and Rapoport (2023) define AI literacy as the "ability of individuals to use AI technologies effectively and ethically" (p. 101) and argue that AI literacy has become an important citizenship competence in recent years. The term AI literacy implies that there are a set of practices, competencies, and skills related to AI that are necessary for participation in contemporary society. Indeed, the recent introduction of ChatGPT, a conversational AI model, resulted in widespread speculation in the mainstream media about how it would change education and why educators should be concerned about generative AI (Lambert & Stevens, 2024; Nelson, 2025). For this reason, there have been many calls for researchers and educators to study the impacts, effects, and possibilities of AI in education. Because this topic is vast, rapidly emerging, and relatively unstudied, there are many ways in which it can and should be explored. In the current study, we approach this topic from a foundational level by creating an instrument to better understand literacy and language arts teachers' perspectives on AI. The Literacy Educators' Attitudes and Perspectives on AI (LEAP-AI) Model was created by surveying 1,045 literacy teachers from around the United States as to what they believe they should know about AI, what aspects of or topics related to AI they perceive they are responsible for teaching to their students, and what students should know about and be able to do with AI. Thus, the purpose of this study was to (1) design and validate a reliable survey for understanding literacy and language arts teachers' perceptions about AI, and (2) report the results of this survey and its implication for literacy and language arts instruction.

## Literature Review

### What is AI Literacy?

As digital technologies evolve, so do our definitions of literacy. In recent years, increasing emphasis has been placed on the development of digital literacies (e.g., Coiro, 2021; Spires et al., 2019). von Gillern et al. (2022) refer to digital literacy as the "...ability to successfully navigate and participate in a variety of digital environments involving information presented in a variety of modes, such as audio, video, printed text, and images," and posit that "the ability to read, write, and interpret information online contributes to the development of democratic capacities" (p.146). Many scholars argue that the list of environments that must be navigated now includes sites and applications that use and produce content with AI. The expansion of AI into everyday activities has led to introduction of the term AI literacy (Kong et al., 2024; Younis, 2024). A recent review of literature on the term AI literacy (Ng et al., 2021) revealed that AI literacy is conceptualized by four components: (1) Knowing the basic functions of AI and how to use AI application, (2) Applying AI knowledge, concepts and applications in different scenarios, (3) Creating with AI and evaluating content generated by AI, and (4) AI ethics. The ever-increasing expansion of AI for instructional planning and use by students holds implications for how we prepare teachers and students to understand and effectively use AI tools for educational and learning purposes, including how AI can influence the production of writing. Researchers are rapidly producing scholarship to help teachers and policymakers navigate this terrain (e.g., Holmes & Miao, 2023; Su & Yang,

2023), but much work is still needed. From previous research, we know that one of the primary factors that determines the extent to which teachers use and seek knowledge about technologies is frequently determined by the extent to which they think it is valuable (Li et al., 2019). In other words, teachers' perceptions matter. This is the subject to which we now turn our attention.

**The Importance of Teacher Perceptions**

Numerous studies have found that teacher beliefs and perceptions have a significant impact on what and how they teach in the classroom. For example, Hutchison & Reinking (2011) found that as teachers' perceptions of the importance of digital technologies for literacy instruction increased, so did their perceptions of their competency for teaching with digital technologies and their perceptions of how digital technologies benefit students. Further, teachers with more positive perceptions about the importance of digital technologies in literacy instruction were more willing to overcome obstacles related to the inclusion of digital technologies, and, ultimately, integrated digital technologies more frequently and with greater variety than teachers who perceived technologies as less important.

Relatedly, in a recent review of the literature, Abel et al. (2022) found that both local settings and global education trends influence teachers' perceptions about technologies in the classroom. They point to national policies and what they refer to as the pro-technology zeitgeist as important global education trends influencing teachers' perceptions. They found that in the local context, teachers' experiences, school pedagogical culture, and teacher training were the most important contextual elements influencing teachers' perceptions. These findings indicate that teachers' perceptions about digital technologies and their role in the classroom can be shaped, or, to be more precise, teachers' perceptions *are* shaped, regardless of whether those in their immediate environment are consciously trying to shape them. Understanding the nature of this relationship is important for ensuring that teachers are empowered to consciously and proactively select the influences that shape their instructional decisions. As it relates to the current study, understanding teachers' perceptions about AI and its emerging presence in the classroom is an important starting point for proactively creating professional development and other materials that can support teachers in developing their professional expertise in this area (Galindo-Domínguez et al., 2023).

**Theoretical Framework**

This study is guided by Diffusion of Innovations Theory (Rogers, 2003), which is a widely recognized framework for understanding how and why innovations spread through societies or social systems. The theory provides insights into the adoption, diffusion, and eventual saturation of new ideas, practices, products, or technologies. This theory is particularly relevant to the topic of our current study since classroom-friendly AI is a rapidly changing innovation with significant potential for enhancing education and supporting teachers and students. For example, generative AI algorithms can create personalized learning materials tailored to individual students' needs, preferences, and learning styles (Hashim et al., 2022) These AI-generated resources could include interactive simulations, customized textbooks, and adaptive learning modules that adapt to students' knowledge levels and progress. Additionally, generative AI models can be used for brainstorming or deepening knowledge about a topic, generating research questions, summary

writing, generating outlines, creating model texts, identifying gaps in an argument, or improving grammar and mechanics within a written text.

However, such benefits or transformations can only occur if teachers choose to introduce innovations into the classroom. Thus, it is particularly important to understand teachers' perceptions about AI and its relevance to the classroom. According to Diffusion of Innovation Theory, the decision to accept or adopt an innovation is a five-stage process consisting of the knowledge stage, persuasion stage, decision stage, implementation stage, and confirmation stage. Of particular relevance to the current study is the persuasion stage in which individuals continue to learn about the innovation and its potential benefits and begin to form attitudes and perceptions toward it. These attitudes are influenced by factors such as the innovation's perceived attributes (e.g., relative advantage, compatibility, complexity, ease-of-use), personal values and beliefs, social norms, and experiences with similar innovations or technologies. Ultimately, positive attitudes toward an innovation are more likely to lead to adoption, while negative attitudes may act as barriers to adoption. Thus, it is important to understand teachers' attitudes and beliefs about AI in order to not only predict likelihood of adoption, but also to develop an understanding of their concerns. Understanding teachers' beliefs and concerns about AI can inform development of future curricular materials, professional development, and educational interventions and innovations.

**Protectionism and Empowerment**

Understanding educators' views on AI can be supported by two key perspectives in the media literacy scholarship: protectionism and empowerment (Potter, 2022). Protectionist perspectives highlight the importance of mitigating potentially negative experiences and consequences that can stem from media engagement (Buckingham, 1998). Such experiences may include falling victim to misinformation or being exposed to objectionable content, such as media that includes violence, sexuality, and/or harassment.

Empowerment perspectives, on the other hand, focus on helping people develop skills they can use productively for various goals (Potter, 2022). Expanding students' ability to utilize media tools to participate in democracy, for example, aligns with the perspective of empowerment (Funk et al., 2016). Further, developing students' skills to use media productively to enhance their economic opportunities or connect with and learn from diverse cultures represents an empowered use of media technologies (RobbGrieco, 2014).

As the perspectives of protectionism and empowerment have historically been applied to a variety of media formats and experiences (Potter, 2022), we theorized these perspectives may also align with and illuminate teachers' perceptions on AI in literacy education. This position is informed by existing scholarship and institutional perspectives (e.g., Casal-Otero et al., 2023; ISTE, 2021; Ng et al., 2021; UNESCO, 2023), which illustrate both opportunities for productive and responsible use of AI (i.e., empowerment) as well as pitfalls to be aware of and mitigate (i.e., protectionism). Our research, thus, was informed by this theorized perspective that literacy teachers' views on AI would align with and could be interpreted by the concepts of empowerment and protectionism.

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Drawing upon key concepts in the literature and our goals of establishing and reporting the results of a reliable and valid survey to examine literacy teachers' views on AI, our study was informed by the following research questions (RQs):

- RQ 1- Does the theorized model proposed in this study maintain acceptable factor structure?
- RQ 2 - What is the relationship among teachers' confidence with technology and AI and their beliefs about AI protectionism and empowerment?

## Methods

### Survey Design

A survey design methodology (Dillman et al., 2014) was utilized for this study. This survey utilized a questionnaire to understand the perspectives of the participants (Johnson & Christensen, 2019). To inform the survey and item development, the research team reviewed scholarship on AI literacy (e.g., Lee et al., 2021; Long & Magerko, 2020; Ng et al., 2021) as well as prominent reports on AI and education (e.g., ISTE, 2021; UNESCO, 2023; U.S. Department of Education Office of Educational Technology, 2023). This review led to the identification of prominent concepts and perspectives relevant to AI in education, such as the importance of students developing a general understanding of AI, ethical issues related to AI, and opportunities for productive uses of generative AI platforms in student learning. These concepts then informed survey item development, with items being crafted to examine the perspectives of literacy and language arts teachers on AI in literacy education. To this end, we created three parallel 11-item sets of Likert-scale items to examine different issues on AI in literacy education, each with a specific focus: 1) Importance for teacher understanding, 2) Importance for teacher teaching, and 3) Importance for student understanding. Structuring surveys in this parallel-item fashion allows researchers to develop a holistic view on teacher views as well as allows for comparison between different areas of focus (Korona, 2020). These 30 items were supplemented with additional Likert-scale items on teacher preparedness, including three items related to AI and one Likert-Scale item on self-efficacy with educational technologies. The draft of the survey was then distributed to a panel of three experts on AI in literacy education to evaluate content validity and provide feedback on survey content and item clarity. This expert feedback was then discussed by two of the researchers to deliberate and decide ways to improve survey and item content and clarity. The final survey included: (a) 3 parallel sets of 11 Likert-scale items each with a different area of focus (importance of teacher understanding, importance of teacher teaching, and importance of student understanding); (b) Three additional items on teacher efficacy and preparedness on AI; and (c) One item on teacher self-efficacy with educational technology. These 34 items were supplemented by 8 demographic items and constitute our Literacy Educators' Attitudes and Perspectives on AI (LEAP-AI) Survey.

### Data Collection and Participants

The LEAP-AI Survey was distributed to PK-12 literacy and language arts teachers across the United States. There were two primary means for identifying and distributing the email to potential

participants. First, the email addresses of literacy and language arts teachers were requested from state-level departments of education. Second, state chapters of the International Literacy Association (ILA) were contacted to request that chapter leaders distribute the survey to their chapter members. After receiving email addresses from state departments of education and agreements from ILA chapter leaders to distribute the survey to chapter members, the LEAP-AI Survey was distributed via Qualtrics. Any participant who did not have at least a 90% survey completion rate was deleted prior to data analysis. This process resulted in 1,045 total surveys being utilized in data analysis. See participant demographics in Table 1.

**Data Analysis**

We examined the factor structure of LEAP-AI by conducting a confirmatory factor analysis (CFA) based on the theory-driven constructs used to design the measure. We created two models and compared fit. We created our theory-driven model with six latent factors: (a) Teacher Understanding: Protectionism with five items; (b) Teacher Understanding: Empowerment with three items; (c) Teacher Teaching: Protectionism, with five items; (d) Teacher Teaching: Empowerment with three items, (e) Student Understanding: Protectionism with five items, and (f) Student Understanding: Empowerment with three items. We then evaluated model fit statistics, including the chi-square statistic, degrees of freedom, and Hu and Bentler's (1999) joint criteria: Comparative Fit Index (CFI) and Tucker–Lewis Index (TLI) ≥ .95, the root mean square error of approximation (RMSEA) ≤ .06, and standardized root mean squared residual (SRMR) ≤ .08. We also used the chi-square divided by the degrees of freedom (2/df) as a measure of model fit, with values of 5 or less being a recommended benchmark (Schumacker & Lomax, 2010). If model fit criteria were not met, we examined modification indices to improve model fit. We used a conservative approach to modification indices by only adding correlations between observed items within factors to ensure all additional parameters fit within the theoretical model (Kline, 2023). There is little empirical guidance related to allowing the estimation of correlations as a function of the modification indices beyond ensuring that all modifications are conceptually and theoretically appropriate. We followed these guidelines but also made the following a priori modification indices rule: we only added correlations with modification indices greater than 50 and resulted in a CFI change of greater than 0.01. Then we created a single latent factor model where all items loaded onto a single g-factor and compared the theory-driven six-factor model to the g-factor model using the log-likelihood test. All analyses were conducted in (R Core Team, 2023). The CFA was estimated using maximum likelihood in the lavaan package (Rosseel, 2012). Following confirmation of the factor structure, we estimated internal consistency reliability by calculating Cronbach's alpha for each latent factor using the psych package (Revelle, 2023).

Following the examination of the measurement model, separate linear regression models were fit for the four teacher preparedness items. Specifically, the teacher preparedness items were regressed on each of the six constructs to determine if preparedness predicted responses for (a) Teacher Understanding: Protectionism, (b) Teacher Understanding: Empowerment, (c) Teacher Teaching: Protectionism, (d) Teacher Teaching: Empowerment, (e) Student Understanding: Protectionism, and (f) Student Understanding: Empowerment. Regression results are presented subsequently.

## Results

### RQ1: Does the theorized model proposed in this study maintain acceptable factor structure?

#### *Descriptive Statistics*

First, we examined the correlations, mean, standard deviation, and skewness of each item included in the CFA (see Table 2). The average response across all items was 4.00 (Agree), with a range of 1.00 to 5.00. The average item-level standard deviation was 0.89; almost a full point on the 5-point scale. Next, we examined the skewness of each item. The average skewness across all 24 items was -0.98 (range -0.16 to -1.54), suggesting that there was slight negative skew (i.e., more values at or near the top of the scoring range). Correlation matrices of items and factors are available as supplemental Tables A1 and A2, respectively. Correlations ranged from .01 to .77, suggesting heterogeneity of relations between many of the individual items (see Table 2).

#### *One- and Six-factor Models*

We estimated two different factor models: a g-model with all items loading onto a single factor and a theory-driven six-factor model. First, we created the single-factor g-model and then, using the modification indices and our a priori rules, added additional correlations between observed variables until the final modified model was identified. We then followed the same procedures for the six-factor model. The model fit indices for all four models are presented in Table 3. Neither single-factor g-model met the recommended 2/df value or Hu and Bentler joint criteria, even after adding modifications.

**Table 1**
*Participant Demographics (n = 1,045)*

| | |
|---|---|
| Grade Level Taught | |
| P – 2 | 19.0% |
| 3 – 5 | 22.8% |
| 6 – 8 | 24.5% |
| 9 – 10 | 14.5% |
| 11 – 12 | 19.3% |
| Years of Teaching Experience | |
| 0 – 4 | 5.8% |
| 5 – 9 | 17.4% |
| 10 – 14 | 19.8% |
| 15 – 19 | 24.8% |
| 20 – 24 | 15.8% |
| 25 or more | 16.4% |
| Age | |
| 20 – 30 | 10.2% |
| 31 – 40 | 26.2% |
| 41 – 50 | 30.5% |
| 51 – 60 | 26.3% |

| | |
|---|---|
| Over 60 | 6.7% |
| School District Setting | |
| Rural | 27.6% |
| Suburban | 48.2% |
| Urban | 24.4% |
| Gender | |
| Female | 83.9% |
| Male | 14.6% |
| Non-Binary / Third Gender | 0.0% |
| Transgender | 0.2% |
| Prefer Not to Say | 1.1% |
| U.S. Region | |
| Northeast | 5.3% |
| Midwest | 33.3% |
| South | 61.4% |

**Table 2**
*Variables, Means, Standard Deviations, and Skewness*

| Variable | *M* | *SD* | *Skewness* |
|---|---|---|---|
| Factor 1: *Teacher Understanding-Protectionism* | 4.38 | 0.56 | |
| Q4. It is important for literacy and language arts teachers to understand that AI generated texts often include inaccuracies | 4.32 | 0.75 | -1.29 |
| Q6. It is important for literacy and language arts teachers to understand that AI tools often include bias in their algorithms and the products they generate. | 4.25 | 0.74 | -0.95 |
| Q8. It is important for literacy and language arts teachers to know techniques to try to determine if digital artifacts (such as images or writing) have been created using AI. | 4.34 | 0.84 | -1.5 |
| Q9. It is important for literacy and language arts teachers to understand ethical issues related to AI. | 4.52 | 0.67 | -1.53 |
| Q12. It is important for literacy and language arts teachers to learn about how people can use AI maliciously to create and propagate misinformation. | 4.5 | 0.69 | -1.54 |
| Factor 2: *Teacher Understanding-Empowerment* | 3.75 | 0.86 | |
| Q5. It is important for literacy and language arts teachers to be able to utilize AI tools in different educational scenarios. | 3.78 | 1 | -0.81 |
| Q7. It is important for literacy and language arts teachers to be able to use AI tools to create instructional content for students. | 3.55 | 1.05 | -0.49 |

| | | | |
|---|---|---|---|
| Q13. It is important for literacy and language arts teachers to understand how to create effective prompts for generative AI tools. | 3.94 | 0.96 | -0.83 |
| Factor 3: *Teacher Teaching-Protectionism* | 4.17 | 0.70 | |
| Q15. Literacy and language arts teachers should be responsible for teaching their students that AI generated texts often include inaccuracies. | 4.29 | 0.79 | -1.28 |
| Q17. Literacy and language arts teachers should be responsible for teaching their students that AI tools often include bias in their algorithms and the products they generate. | 4.13 | 0.88 | -1.1 |
| Q19. Literacy and language arts teachers should be responsible for teaching their students techniques to try to determine if digital artifacts (such as images or writing) have been created using AI. | 3.88 | 0.95 | -0.76 |
| Q20. Literacy and language arts teachers should be responsible for teaching their students ethical issues related to AI. | 4.3 | 0.87 | -1.43 |
| Q23. Literacy and language arts teachers should be responsible for teaching that people can use AI maliciously to create and propagate misinformation. | 4.3 | 0.83 | -1.37 |
| Factor 4: *Teacher Teaching-Empowerment* | 3.35 | 1.04 | |
| Q16. Literacy and language arts teachers should be responsible for teaching their students to utilize AI tools in different educational scenarios. | 3.49 | 1.15 | -0.48 |
| Q18.Literacy and language arts teachers should be responsible for teaching their students to create products using AI tools. | 3.14 | 1.14 | -0.16 |
| Q24. Literacy and language arts teachers should be responsible for teaching their students how to create effective prompts for generative AI tools. | 3.4 | 1.15 | -0.35 |
| Factor 5: *Student Understanding-Protectionism* | 4.32 | 0.61 | |
| Q26. It is important for literacy and language arts students to understand that AI generated texts often include inaccuracies. | 4.37 | 0.7 | -1.33 |
| Q28. It is important for literacy and language arts students to understand that AI tools often include bias in their algorithms and the products they generate. | 4.34 | 0.71 | -1.18 |
| Q30. It is important for literacy and language arts students to know techniques to try to determine if digital artifacts (such as images or writing) have been created using AI. | 4.05 | 0.85 | -0.96 |
| Q31. It is important for literacy and language arts students to understand ethical issues related to AI. | 4.43 | 0.72 | -1.47 |

| | | | |
|---|---|---|---|
| Q34. It is important for literacy and language arts students to understand how people can use AI maliciously to create and propagate misinformation. | 4.4 | 0.71 | -1.27 |
| Factor 6: *Student Understanding-Empowerment* | 3.47 | 1.01 | |
| Q27. It is important for literacy and language arts students to be able to utilize AI tools in different educational scenarios. | 3.56 | 1.05 | -0.6 |
| Q29. It is important for literacy and language arts students to be able to create content using AI tools. | 3.32 | 1.12 | -0.29 |
| Q35. It is important for literacy and language arts students to understand how to create effective prompts for generative AI tools. | 3.53 | 1.11 | -0.5 |

**Table 3**
*Model Fit Statistics*

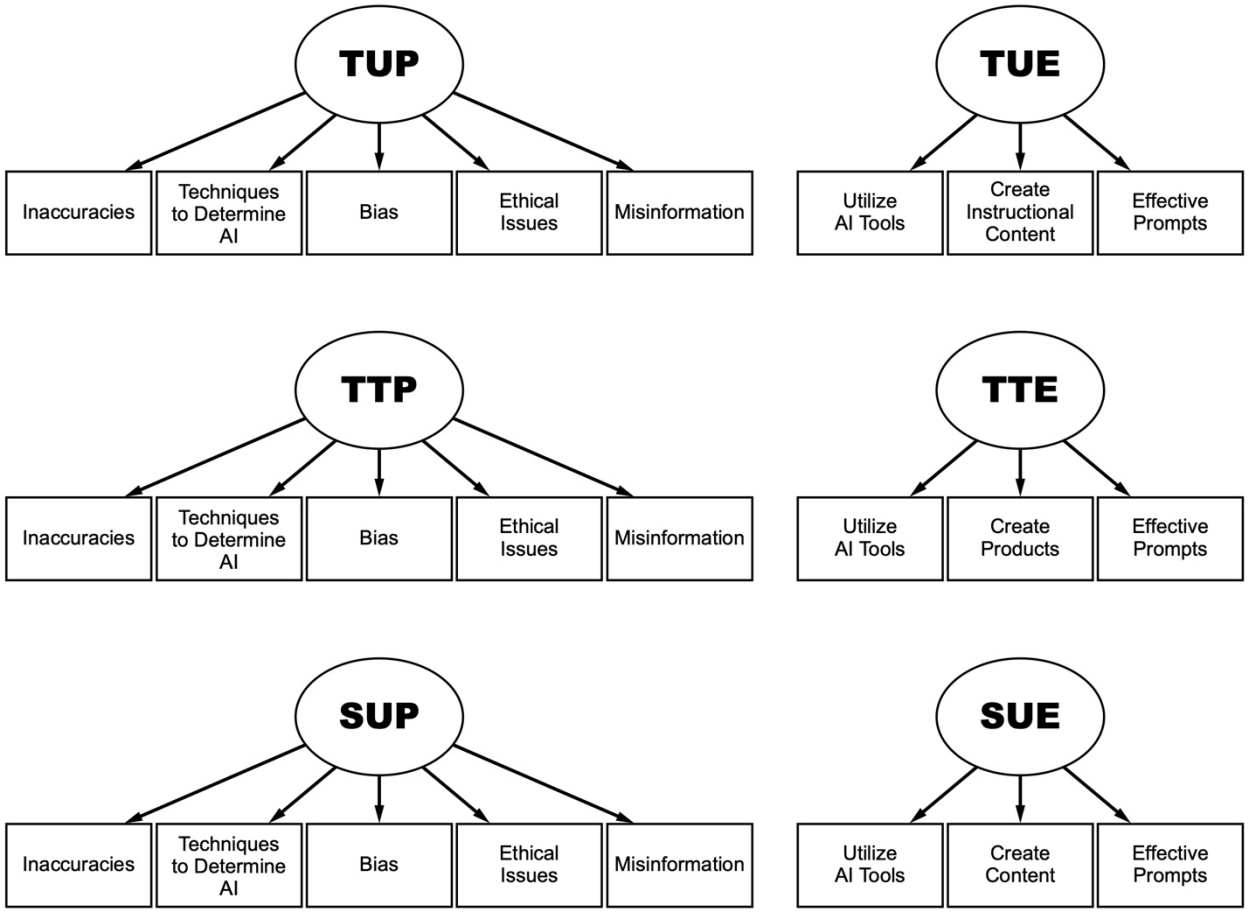
| | One-factor Model | | Six-factor Model | |
|---|---|---|---|---|
| Model Fit Index | No Modifications | Modifications | No Modifications | Modifications |
| Parameters | 48 | 75 | 63 | 76 |
| $\chi^2$ | 8739.75 | 2284.51 | 1807.27 | 899.72 |
| df | 252 | 225 | 237 | 224 |
| $\chi^2$/df | 34.68 | 10.15 | 7.63 | 4.02 |
| CFI | 0.499 | 0.878 | 0.907 | 0.960 |
| TFI | 0.451 | 0.851 | 0.892 | 0.951 |
| RMSEA | 0.184 | 0.096 | 0.081 | 0.055 |
| LL | 0.180 | 0.092 | 0.078 | 0.051 |
| UL | 0.187 | 0.099 | 0.085 | 0.059 |
| SRMR | 0.176 | 0.127 | 0.055 | 0.048 |

Note: CFI is Comparative Fit Index, TFI is Tucker–Lewis Index, RMSEA is root mean square error of approximation, SRMR is standardized root mean squared residual, LL is 90% lower limit, and UL is 90% upper limit.

The six-factor model without modifications had much better fit than either of the single-factor g-models, but the model fit statistics were still below recommended values. After adding modifications using our a priori rule, the modified six-factor model met both the recommended 2/df value and Hu and Bentler joint criteria. We confirmed that the modified six-factor model fit the data better than the modified single-factor g-model using log-likelihood test. The result was statistically significant (2 difference = 1384.8, $p < .001$). Therefore, we retained the modified six-factor model that included (a) Teacher Understanding: Protectionism, (b) Teacher Understanding: Empowerment, (c) Teacher Teaching: Protectionism, (d) Teacher Teaching: Empowerment, (e) Student Understanding: Protectionism, and (f) Student Understanding: Empowerment (see Figure

1). For reference, the modified six-factor model included 13 correlations between observed variables.

**Figure 1.** *LEAP-AI Model*




Note. TUP = Teacher Understanding: Protectionism, TUE = Teacher Understanding: Empowerment, TTP = Teacher Teaching: Protectionism, TTE = Teacher Teaching: Empowerment, SUP = Student Understanding: Protectionism, SUE = Student Understanding: Empowerment

Table 4 presents the parameter estimates for the final modified six-factor model. All parameters were statistically significant. The smallest factor loadings were the items loading onto F1, with only one indicator loading greater than .70. The items with the highest loading values were those that loaded on F6. Table 5 presents the covariances. A few factors were highly correlated. The standardized estimates were largest between F2 and F6 (.80), F3 and F5 (.84), and F4 and F6 (.94). We report the observed correlations between items in Table 4, but note none were greater than .50, suggesting that they improved model fit, but were only moderately correlated.

**Table 4**

*Theory-Driven, Modified Six-Factor CFA Model Parameter Estimates*

| Factor | Item | Est. | Std.Err | p-value | Std. Est. |
|---|---|---|---|---|---|
| F1 | | | | | |
| | Q4 | 1.00 | 0.41 | | |
| | Q6 | 1.19 | 0.07 | 0.000 | 0.67 |
| | Q8 | 1.22 | 0.08 | 0.000 | 0.62 |
| | Q9 | 1.11 | 0.07 | 0.000 | 0.69 |
| | Q12 | 1.18 | 0.07 | 0.000 | 0.73 |
| F2 | | | | | |
| | Q5 | 1.00 | 0.71 | | |
| | Q7 | 1.24 | 0.05 | 0.000 | 0.85 |
| | Q13 | 1.07 | 0.04 | 0.000 | 0.80 |
| F3 | | | | | |
| | Q15 | 1.00 | 0.62 | | |
| | Q17 | 1.17 | 0.04 | 0.000 | 0.82 |
| | Q19 | 1.03 | 0.05 | 0.000 | 0.67 |
| | Q20 | 1.12 | 0.04 | 0.000 | 0.79 |
| | Q23 | 1.02 | 0.04 | 0.000 | 0.74 |
| F4 | | | | | |
| | Q16 | 1.00 | 1.00 | | |
| | Q18 | 1.00 | 0.03 | 0.000 | 0.88 |
| | Q24 | 1.01 | 0.03 | 0.000 | 0.86 |
| F5 | | | | | |
| | Q26 | 1.00 | 0.59 | | |
| | Q28 | 1.06 | 0.03 | 0.000 | 0.86 |
| | Q30 | 0.94 | 0.04 | 0.000 | 0.64 |
| | Q31 | 0.98 | 0.03 | 0.000 | 0.79 |
| | Q34 | 0.96 | 0.03 | 0.000 | 0.80 |
| F6 | | | | | |
| | Q27 | 1.00 | 0.96 | | |
| | Q29 | 1.04 | 0.03 | 0.000 | 0.89 |
| | Q35 | 0.97 | 0.03 | 0.000 | 0.84 |

Note. Est. is estimate, std.err is standard error, and Std. Est. is standardized estimate.

**Table 5.**

*Theory-Driven, Modified Six-Factor CFA Model Covariances*

| Covariances | Est. | Std.Err | p-value | Std. Est. |
|---|---|---|---|---|
| F1 ~~ | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | F2 | 0.11 | 0.01 | 0.000 | 0.37 |
| | F3 | 0.19 | 0.02 | 0.000 | 0.73 |
| | F4 | 0.05 | 0.02 | 0.002 | 0.12 |
| | F5 | 0.19 | 0.01 | 0.000 | 0.78 |
| | F6 | 0.05 | 0.02 | 0.002 | 0.12 |
| F2 ~~ | | | | | |
| | F3 | 0.17 | 0.02 | 0.000 | 0.38 |
| | F4 | 0.56 | 0.04 | 0.000 | 0.79 |
| | F5 | 0.14 | 0.02 | 0.000 | 0.33 |
| | F6 | 0.55 | 0.04 | 0.000 | 0.80 |
| F3 ~~ | | | | | |
| | F4 | 0.27 | 0.03 | 0.000 | 0.44 |
| | F5 | 0.31 | 0.02 | 0.000 | 0.84 |
| | F6 | 0.21 | 0.02 | 0.000 | 0.35 |
| F4 ~~ | | | | | |
| | F5 | 0.17 | 0.02 | 0.000 | 0.29 |
| | F6 | 0.88 | 0.05 | 0.000 | 0.93 |
| F5 ~~ | | | | | |
| | F6 | 0.19 | 0.02 | 0.000 | 0.33 |
| | | | | | |
| Q19 ~~ | Q30 | 0.23 | 0.02 | 0.000 | 0.49 |
| Q4 ~~ | Q5 | 0.16 | 0.02 | 0.000 | 0.38 |
| Q20 ~~ | Q31 | 0.10 | 0.01 | 0.000 | 0.39 |
| Q8 ~~ | Q9 | 0.09 | 0.01 | 0.000 | 0.28 |
| Q23 ~~ | Q34 | 0.06 | 0.01 | 0.000 | 0.24 |
| Q4 ~~ | Q6 | 0.08 | 0.01 | 0.000 | 0.23 |
| Q24 ~~ | Q35 | 0.10 | 0.02 | 0.000 | 0.29 |
| Q18 ~~ | Q29 | 0.09 | 0.01 | 0.000 | 0.30 |
| Q23 ~~ | Q24 | 0.07 | 0.01 | 0.000 | 0.21 |
| Q15 ~~ | Q16 | 0.07 | 0.01 | 0.000 | 0.24 |
| Q30 ~~ | Q29 | 0.06 | 0.01 | 0.000 | 0.18 |
| Q26 ~~ | Q27 | 0.03 | 0.01 | 0.000 | 0.18 |

| | | | | | |
|---|---|---|---|---|---|
| Q31 ~~ | Q34 | 0.03 | 0.01 | 0.000 | 0.16 |

Note. Est. is estimate, std.err is standard error, and Std. Est. is standardized estimate.

**RQ 2: What is the relationship among teachers' confidence with technology and AI and their beliefs about AI protectionism and empowerment?**

***Descriptive Statistics***

We calculated the descriptive statistics for the educational technology self-efficacy item and the three teacher preparedness items on AI (see Table 6). Responses ranged from 1.00 (strongly disagree) to 5.00 (strongly agree). As can be seen in Table 6, results indicate that teachers are more confident in their abilities to integrate educational technologies in general than their abilities with AI. Further, teachers do not feel that their schools have prepared them to issues related to AI.

**Table 6.**
*Means & Standard Deviations of Teacher Preparedness Items*

| Item | Mean | SD |
|---|---|---|
| In general, I am confident in my ability to effectively integrate educational technologies. | 3.81 | 0.95 |
| My school has prepared literacy and language arts teachers to handle AI related issues in their teaching. | 2.08 | 1.03 |
| I am confident in my ability to effectively use AI tools for personal purposes. | 3.15 | 1.21 |
| I am confident in my ability to effectively use AI tools for educational purposes. | 3.00 | 1.21 |

***Regression Analyses***

Six separate regression analyses were run with the individual constructs from the measurement model serving as the Dependent Variable (DV) and Teacher Preparedness items serving as independent variable (IV). I am confident in my ability to effectively integrate educational technologies significantly predicted Teacher Understanding: Empowerment ( = .17), Teacher Teaching: Protectionism ( = .10), Teacher Teaching: Empowerment ( = -.08), Student Understanding: Protectionism ( = .09), and Student Understanding: Empowerment ( = -.09). My school has prepared literacy and language arts teachers to handle AI related issues in their teaching significantly predicted Teacher Understanding: Protectionism ( = -.16), Teacher Teaching: Empowerment ( = .12), Student Understanding: Protectionism ( = -.10), and Student Understanding: Empowerment ( = .09). I am confident in my ability to effectively use AI tools for personal purposes significantly predicted Teacher Understanding: Empowerment ( = .11), Teacher Teaching: Protectionism ( = .14), Teacher Teaching: Empowerment ( = .17), Student Understanding: Protectionism ( = .15), and Student Understanding: Empowerment ( = .16). I am confident in my ability to effectively use AI tools for educational purposes significantly predicted Teacher Understanding: Empowerment ( = .33), Teacher Teaching: Empowerment ( = .19), and Student Understanding: Empowerment ( = .19). Positive values represent positive directionality, where increases in the IV predicts increases in the DV and vice versa. Negative values represent

inverse directionality, where increases in the IV predicts decreases in the DV and vice versa. See Table 7 for regression analyses results. Specifically, results indicate that as teachers' confidence in integrating educational technology increased, values on the three protectionism constructs increased, while values on two of the three empowerment items decreased (i.e., teacher teaching, student understanding). Higher levels of school-related preparation predicted higher levels on two of three empowerment constructs (i.e., teacher teaching, student understanding), but lower levels on two of the three protectionism constructs (i.e., teacher understanding, student understanding). Higher confidence in using AI for personal purposes predicted higher levels on all empowerment constructs and two of three protectionism constructs (i.e., teacher teaching, student understanding). Similarly, higher confidence in using AI for educational purposes predicted higher levels on all three empowerment constructs.

**Table 7.**
*Regression analyses for six-factor constructs and teacher preparedness items*

| | Teacher Understanding: Protectionism | | Teacher Understanding: Empowerment | | Teacher Teaching: Protectionism | | Teacher Teaching: Empowerment | | Student Understanding: Protectionism | | Student Understanding: Empowerment | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | β | *t* | β | *t* | β | *t* | β | *t* | β | *t* | β | *t* |
| I am confident in my ability to effectively integrate educational technologies. | .17*** | 4.82 | -.01 | -.35 | .10** | 2.93 | -.07* | -2.15 | .09* | 2.52 | -.09** | -2.70 |
| My school has prepared literacy and language arts teachers to handle AI related issues in their teaching. | -.16*** | -5.04 | -.03 | -1.10 | -.04 | -1.08 | .12*** | 3.74 | -.10** | -2.92 | .09** | 2.69 |
| I am confident in my ability to effectively use AI tools for personal purposes. | .10 | 1.78 | .11* | 2.08 | .14* | 2.46 | .17** | 3.06 | .15** | 2.62 | .16** | 2.84 |
| I am confident in my ability to effectively use AI tools for educational purposes. | .02 | .25 | .33*** | 5.91 | .01 | .08 | .19*** | 3.40 | -.03 | -.49 | .19*** | 3.28 |

*Note.* β = standardized beta coefficient, * = $p < .05$, ** = $p < .01$, *** = $p < .001$

Journal of Literacy and Technology
Volume 26, Number 3: Winter 2025
ISSN: 1535-0975

## Discussion

LEAP-AI survey results demonstrate the perspectives of literacy teachers from the United States on the relevance of AI in literacy and language arts education. The model also addresses key concepts in the AI literacy literature, including knowing how to use AI, applying AI knowledge, creating and evaluating AI content, and AI ethics (Long & Magerko, 2020; Ng et al., 2021). The LEAP-AI instrument, therefore, serves as a way to measure educators' views on AI literacy. Given the rapid proliferation of AI tools and their substantial consequences for literacy teaching and learning, LEAP-AI can serve as a reliable and validated tool for scholars, teacher educators, and educational administrators to examine teachers' views on AI literacy across time and contexts. This is particularly important as we are in the early years of mass availability of generative AI tools to the general populace, and new more powerful and versatile tools are on the horizon (Emmer, 2024).

The research confirmed our theoretical perspective described at the end of the literature review about how the items focused on protectionism would cohere in the model as would empowerment items. Results illustrated teachers' perceptions on AI differed substantially between items related to protectionism and empowerment (Potter, 2022), resulting in three protectionist factors and three empowerment factors. While these concepts are commonly utilized in the media literacy scholarship (RobbGrieco, 2014; Potter, 2018; Higdon et al., 2021), they are useful for understanding teachers' views on AI as well. The protectionist constructs and items focused on issues such as ethics, malicious use of AI, and inaccuracies generated by AI tools. The empowerment constructs and items, on the other hand, focused on issues such as creating content, crafting effective prompts, and utilizing AI tools. For each category of items, the teachers placed higher values on protectionist constructs compared to empowerment constructs. Teacher understanding means were 4.38 for protectionism compared to 3.75 for empowerment. Teacher teaching means were 4.17 for protectionism compared to 3.35 for empowerment. Student understanding means were 4.32 for protectionism compared to 3.47 for empowerment. Teachers' high ratings of the importance of protectionist-focused behaviors is certainly understandable, yet a balance between protectionism and empowerment is valuable. Collectively, survey results illustrate the higher values teachers placed on protectionism than empowerment as well as provide empirical data that highlight teachers' priorities and perspectives related to key AI literacy issues in the literature (Lee et al., 2021; UNESCO, 2023).

Research illustrates that online safety and ethics are top-priorities for teachers as relates to digital literacies (Tomczyk, 2020) and digital citizenship (Öztürk, 2021). This focus on digital safety and ethics is also emphasized by educational organizations, such as the National Council of Teachers of English (2019) in their position statement on literacy in a digital age as well as ISTE (2016) in their digital citizenship standards for students. Educators and policy makers understandably place high value protectionism, safety, and ethics as relates to AI (Long & Magerko, 2020; U.S. Department of Education Office of Educational Technology, 2023), yet empowering students to effectively utilize AI tools for academic, social, and economic purposes is also important (Kong et al., 2024; Ng et al., 2021). Given the transformative nature of AI and how it can support student learning (ISTE, 2021; Onesi-Ozigagun et al., 2024), facilitate and enhance creative processes (Ali et al., 2019; Creely et al., 2023), and contribute to productivity and yield economic benefits (Dell-

Acqua et al., 2023; Gao & Feng, 2023), children deserve to develop AI literacy skills, so they can utilize and benefit from AI platforms.

Supporting students' understanding of and abilities with AI is important, which begs the question of who should teach students these skills. The mean values of the survey categories suggest the answer may not be entirely clear. Of the three primary categories of survey items, teacher teaching had the lowest mean values when accounting for differences in protectionist constructs and empowerment constructs. Teacher teaching has a mean value of 4.17 for protectionism compared to a 4.38 for teacher understanding protectionism and 4.32 for student understanding protectionism. Teacher teaching has a mean value of 3.35 for empowerment compared to a 3.75 for teacher understanding empowerment and 3.47 for student understanding empowerment. These results indicate that participants' felt it was more important for literacy teachers and students understand AI related issues than it was for literacy teachers to teach AI related issues. This may be because while teachers recognize the importance of AI, they feel they do not have time to teach it in their already full schedules or it may be more appropriate for another type of educator to support students' AI learning (e.g., a media specialist or librarian). Further research is needed to understand which types of teachers are well-positioned to support students AI literacy skills. In our view, it is likely that multiple educators across content areas will be increasingly encouraged or required to address AI related issues in their teaching in ways that support students' overall AI literacy skills.

In order to teach children AI skills, it is obviously valuable for teachers themselves to have a suite of skills and knowledge that can support such efforts. The teacher preparedness items on AI (see Table 6), though, illustrate that literacy teachers do not see themselves as well-prepared to do so as indicated by the items on teachers' ability to effectively utilize AI for personal purposes and educational purposes. Results also indicate that these literacy educators generally disagree that their schools have prepared them to handle AI related issues in their teaching. These are three of the lowest rated items completed by survey participants and are notably lower than the self-efficacy with educational technology item as well, indicating a substantial disparity between self-efficacy with educational technology compared to their preparedness with AI. Given that educational technologies have been around for decades, but AI tools are relatively new, this isn't entirely surprising. Yet, it still demonstrates the need for teachers to develop their skills to teach AI literacy knowledge and skills to their students, an effort that warrants schools support and professional development and aligns with existing calls in the literature to support teachers develop their own AI skills (Celik et al., 2022)

**Relationships Among Teachers' Confidence and Perceived Importance**

The regression analyses of the six factors and teacher preparedness items yielded interesting results (see Table 6). The higher teachers' self-confidence in using AI for both personal and educational purposes were associated with higher levels for all three empowerment constructs. Similarly, teachers who indicated a higher agreement with statements about how their school has prepared literacy teachers to deal with AI related issues had higher values for two empowerment constructs (teacher teaching and student understanding). A potential explanation for this is that teachers with greater confidence had more experience with AI tools and recognized the benefits of effectively

using AI, aligning with an empowerment perspective. Interestingly, the item on schools preparing teachers to use AI was inversely related to two of the protectionist factors (teacher understanding and student understanding). A possible reason for this inverse relationship is that teachers who felt less prepared to deal with AI issues were more concerned about potential negative impacts of AI. Collectively, these results demonstrate a relationship between teacher preparedness with AI and the value the teacher places on protectionist and empowerment constructs, which leads us to theorize that greater familiarity with AI generally leads to higher value placed on empowerment and less familiarity generally leads to higher value placed on protectionism. While this perspective was not corroborated by across all three AI teacher preparedness items across all six constructs, it is a general trend that can be observed in the data.

Regression results of teachers' confidence in their ability to effectively integrate educational technologies in general with the six factors contrasts with the preparedness with AI regression in an interesting and important way. Teachers with higher self-efficacy with educational technology corresponded with higher ratings for all three protectionist constructs and lower ratings for two of the empowerment constructs (teacher teaching and student understanding). This stands in contrast to the AI-specific items on teacher preparedness in which greater preparedness generally led to greater value placed on empowerment and less preparedness was often associated with higher protectionism. The notable difference in relationships between the six LEAP-AI constructs when comparing AI-specific items to a broader educational technology self-efficacy item in general suggests that AI tools, at least at this point in time, are unique and cannot simply be lumped in with educational technologies in general. This, coupled with the low values on teacher preparedness with AI (see Table 6), indicate a need for AI-specific training and professional development.

Teacher education and professional development on AI literacy would likely increase the speed and quality of classroom integration of AI in classrooms by accelerating the progression of the five stages of Diffusion of Innovations Theory: knowledge, persuasion, decision, and implementation (Rogers, 2003). Professional development would support teachers' knowledge and understanding of AI and can demonstrate its classroom value in ways that lead to and support teachers' successful implementation. Classroom integration of AI literacy would in turn support students as they progress through the five stages of Diffusion of Innovations as well.

We believe there are few places better suited to support students' AI literacy development and their ability to effectively utilize AI tools than literacy education. While computer science education may be best positioned to help children develop technical knowledge of and create and train AI systems, literacy educators are primary contributors to children's learning of contemporary media landscapes and ways to understand, navigate, and participate in digital spaces and processes (Hobbs et al., 2022). This, coupled with the fact that children in the United States generally spend more time in literacy education than any other content area, demonstrates the central role literacy teachers can and should play in children's learning of AI literacy knowledge and skills. Understanding and effectively utilizing AI platforms essentially constitutes a subset of digital literacies (Spires et al., 2019) that will continue to evolve and thread its way through various digitally mediated communication processes, including accessing information, organizing and generating knowledge, and communicating in online spaces.

## Implications

There are a few important implications from this study. First, given that teachers indicated they generally felt they had not been prepared by their schools to deal with AI related issues in literacy education and nor were they confident in their own AI skills, it is crucial for districts, educational organizations, and government agencies provide professional training, curricula, and access to necessary technologies effectively to promote teachers' understanding of and effectiveness with AI technology. Given public and educational access to AI tools is still relatively new, teachers are likely still in the persuasion stage with AI, and there is opportunity to positively influence their attitudes about AI. Diffusion of Innovations Theory (Rogers, 2003) posits that the more positive one's attitude about an innovation, the more likely they are to adopt the innovation. Thus, educating teachers about AI, its importance in society, and the value of addressing AI in literacy education may lead to teachers deciding to implement AI tools in teaching and learning in ways that support students' AI literacy.

Professional development would include comprehensive and structured programming for teacher education including professional development for in-service teachers and course- and field-work for preservice teachers. While many schools have made initial strides to support teachers in their ability to effectively utilize AI tools (Casal-Otero et al., 2023), it is likely that much of teachers' learning about AI has been self-guided with teachers exploring key concepts, implications for education, and engaging with AI tools themselves to develop their own abilities and understanding. Schools, districts, and governments need to support literacy teachers through professional development, sharing curricula, and providing technological resources to strengthen teachers' ability to effectively utilize AI tools in literacy teaching and learning.

In alignment with recent scholarship and notable organizational reports on AI in education, we believe professional training on AI in literacy should address at least four key themes: general understandings of the AI landscape, ethics, protectionism, and empowerment (see Table 8). These themes draw from the literature and organizational documents (e.g., Casal-Otero et al., 2023; ISTE, 2023; Ng et al., 2021; U.S. Department of Education Office of Educational Technology, 2023) and are not necessarily discrete or mutually exclusive. Yet, we believe they represent crucial AI literacy issues in a way can support balanced professional development experiences for teachers to learn about and appropriately address AI related issues in their teaching.

General understandings of AI are crucial for AI literacy and help teachers understand what AI is, how it functions, and what it can do (Long & Magerko, 2020). While literacy teachers do not need to have deeply technical understandings of how to create and train AI systems, it is valuable for them to understand key AI concepts, such as developing a basic understanding of AI systems, including how they are trained on data (e.g., written text, images, audio, etc.) with algorithms to identify patterns in the data, patterns that can inform their ability to generate content that aligns with those patterns (Long & Magerko, 2020). It is valuable for teachers to develop understandings of different types of AI technologies and popular AI tools in society and education in ways that support their ability to make decisions about which types of AI are appropriate for them to integrate into their teaching. Finally, while AI tools obviously serve a variety of functions in ways that vary

for different users, there are myriad challenges and limitations of AI that are deserve teacher consideration (Crompton et al., 2024).

**Table 8.**

*Core Themes for Teacher Professional Development on AI Literacy*

| | General Understandings of the AI Landscape | Ethics (Responsibility in Development and Deployment) | Protectionism (Safeguarding Society and Users) | Empowerment (Productive Use) |
|---|---|---|---|---|
| Key Issues | Overview of AI and Machine Learning | Bias in AI Algorithms and their Products | Misinformation | Prompt Engineering |
| | Types of AI Technologies | Equitable Access and Use | Data Privacy | AI-Assisted Lesson Planning and Content Generation |
| | Popular AI Tools in Society and Education | Ethical Use in Education | Safeguarding Against Misuse | AI for Personalized Learning and Feedback |
| | Challenges and Limitations of AI | Policy Development for Schools and Classrooms | Impact on Student Well-Being | Educational Assessment with AI |

Beyond general understandings of AI, it is essential that educators learn about and teach ethical issues related to AI (UNESCO, 2023; U.S. Department of Education Office of Educational Technology, 2023). It is important for teachers and students to know that AI systems often include bias and reflect social and cultural biases (Ferrer et al., 2021) in ways that can adversely affect historically marginalized groups and ossify oppressive systems. Relatedly, inequities in AI access may result in a new digital divide (Carter et al., 2020) in which the people with AI access can boost productivity and creativity and people with limited access cannot reap the benefits of AI. While some AI tools are freely available, many of the most advanced AI platforms (such as GPT 4o and Midjourney) cost money to utilize. This represents a barrier for both schools and educators in helping teachers and students engage with AI platforms, a barrier likely to more prominently affect schools serving low-income communities more than schools in wealthier areas. It is valuable for educators to consider ethical issues and contribute to school and classroom policy development on AI as well. AI-related plagiarism is a major concern for many educators, who understandably worry that students will utilize generative AI to write their essays and create other artifacts for school assignments without providing acknowledgement or credit that the writing or artifact was created or improved by AI (Lee et al., 2024). Discussing and implementing AI policies that promote ethical use and allow for teacher autonomy and professional judgement are worthy topics for professional development.

Protectionist perspectives and topics deserve attention as well. It is important for educators to both reflect on and teach that AI can produce misinformation. This can occur via malicious actors who intentionally create and propagate misinformation to sow confusion and discord as well as through

AI "hallucinations" in which output contains false or misleading information (Maleki et al., 2024). Data privacy considerations are also crucial considerations for both teachers and students (Akgun & Greenhow, 2022). AI tools often use new input from users to further train the platform, meaning that when teachers or students enter information into an AI tool that information may be used in ways that are poorly understood by users. Being mindful and selective about what types of information to input into AI tools is valuable, along with the more familiar issues of data privacy related to being careful about which platforms to use and personal information to provide. Safeguarding against misuse is valuable as well and applies to both students and teachers. For students, this may focus on mitigating student plagiarism and helping children understand problems and consequences of producing misleading information. For teachers, on the other hand, misuse seems less likely, but, for example, unloading all grading and feedback to AI would likely be problematic. Relatedly, it is important for teachers and administrators to understand the impact of AI on student well-being, an area in need of additional research. Interactions will likely affect the way people, including students, think about personal, social, and academic issues. For example, students may be less likely to approach a teacher, peer, or parent for feedback on their writing or ideas, if they can simply ask Chat-GPT. This may have social, psychological, and academic consequences, and teachers can individually and collectively examine, reflect on, and address ways that AI tools affect student well-being.

In terms of empowerment, supporting processes relevant to literacy education may be focal. Professional development should support teachers' understanding of and fluency with crafting effective prompts is important. Prompt engineering, the ability to craft prompts and provide input to help a user achieve their designed goal, is highly valuable for users of generative AI including in literacy education. Lo (2023) created the CLEAR Framework for prompt engineering that involves the following components: Concise (brevity and clarity), Logical (structured and coherent), Explicit (clear output specifications), Adaptive (flexibility and customization), and Reflective (continuous evaluation and improvement). Professional development that supports teachers' understanding of prompt engineering, whether through the CLEAR Framework or another perspective, would help teachers effectively utilize AI tools and teach their students strategies for productive use. Prompt engineering skills can help teachers and students across various AI tools in ways that support lesson planning and content generation. Teachers and students can also use AI to tailor learning experiences to the needs and interests of individual students, provide feedback on students' writing and ideas, and assess students' performance and progress.

Ultimately, professional development is needed to support teachers' understanding of and ability to effectively utilize AI tools. Valuable AI issues to address include promoting general understandings, ethical issues, protectionism, and empowerment. These represent crucial elements of AI literacy (Long & Magerko, 2020; Ng et al., 2021). These themes are not mutually exclusive. For example, understanding the AI landscape can support empowerment, and misinformation and plagiarism relate to both ethics and protectionism. Yet, we believe these four themes provide a broad and well-balanced coverage of AI literacy issues in a way that scaffold and support teacher understanding of key AI issues in society and education. Professional development in these areas would not only support teachers' AI literacy but likely help persuade them to implement and address AI issues in their classrooms (Rogers, 2003) in ways that help their students develop AI literacy skills as well.

## Limitations

While this research illuminates important issues related to literacy teachers' perspectives on AI and literacy and language arts education, it has its limitations. First, this research examined the perspectives of literacy teachers in three of the four census regions from the United States (i.e., Northeast, South, and Midwest), yet it did not include teachers from the western region of the U.S. nor other countries and locations around the world. It is important that future research examine the perspectives of literacy teachers in diverse locations around the world to develop a better understanding of literacy educators' views on AI as well as patterns within and across different locations. Second, this research investigated educators' view on AI in literacy education, but it did not examine their if or how they actually address AI related issues in their classrooms. It is crucial that future research examines classroom instruction and identifies effective classroom practices as relates to helping students develop a general understanding of AI tools and how they can safely, responsibly, and productively use AI platforms in their academic and personal lives. Third, given that participants in this study indicated they had received limited preparation from their schools on how to handle AI related issues in their teaching, future studies would benefit from examining the content, activities, and efficacy of different professional development programming on AI for literacy educators. Further, studies that examine how AI related issues can be integrated into preservice literacy teacher education would also be valuable (Powers et al., 2025).

## Conclusion

Given the transformative nature of AI and how it will permeate media landscape and shape the future global economy (Gao & Feng, 2023), it is crucial that schools and governments prepare literacy teachers to utilize these platforms in their teaching to support students' literacy learning and children's ability to ethically and productively utilize AI tools in their academic, social, and economic endeavors. This study demonstrates that literacy teachers recognize the importance of AI in literacy education but feel limited in their abilities to effectively address AI issues in their teaching. Thus, it is critical that literacy researchers and teacher educators examine effective approaches for teachers to learn about, use, and teach AI technology and skills. Educators, politicians, and AI experts of diverse backgrounds and perspectives recognize that AI will reshape education, the economy, and society (Casal-Otero et al., 2023; Dell-Acqua et al., 2023), and literacy educators are well-positioned to have a primary role in promoting AI literacy for all children. Schools, educational institutions, and governments should invest accordingly.

**Declarations of Interest Statement:** The authors declare no conflicts of interest.

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Journal of Literacy and Technology
Volume 26, Number 3: Winter 2025
ISSN: 1535-0975


# Do Technology and Social Media Help or Hinder Middle Grade and Secondary Students' Literacy Skills?: Teachers' Perceptions

Alma D. Stevenson, Ph.D.
almastevenson@georgiasouthern.edu
Professor, Literacy Education
Georgia Southern University

Leslie Roberts-Chala, Ph.D.
ldroberts@georgiasouthern.edu
Associate Professor, Reading Education
Georgia Southern University

Antonio Gutierrez de Blume, Ph.D.
agutierrez@georgiasouthern.edu
Professor, Educational Research
Georgia Southern University

## Abstract

School districts across the United States have increasingly advocated for incorporating technology into daily instruction and assessment. College of Education faculty at a university in the Southeast recently noticed their graduate students expressing contradictory opinions and perspectives regarding the impact of technology and social media on their students' literacy skills. These professors developed and used a questionnaire to understand teachers' perceptions regarding the impact of technology and social media on their students' literacy skill development. Teachers reported that technology helped students develop literacy skills, allowing for differentiation, choice, and creativity. However, technology also hindered students' ability to develop essential writing skills and critical thinking, including their ability to evaluate sources. Researchers suggest various professional development programs that focus on the strategic and systematic use of these tools in the classroom, including an emphasis on students' development of critical thinking, metacognitive skills, and social-emotional learning.

**Keywords:** Critical thinking skills, differentiation, reading, social media, source evaluation, technology, writing.

## Introduction

The 21st century has underscored the need to increase the use of technology in classrooms to develop functional, digitally literate citizens for our global society. Decades of research suggest that technology can keep up with the changing needs of students because it is an ongoing, changing entity that continuously enhances an individual's ability to search for, obtain, and produce information (Leu & Kinzer, 2000; Leu et al., 2004; Leu et al., 2017). Often referred to as New

Literacies, "reading, reading instruction, and more broadly conceived notions of literacy and literacy instruction are being defined by change in even more profound ways as new technologies require new literacies" (Leu et al., 2004, p. 1570).

School districts across the United States have increasingly advocated for incorporating technology into the teaching, learning, and assessment processes. This, in turn, prompted public school systems to incorporate computers, Chromebooks, iPads, or other technology into classrooms that students could access individually.

This increase in technology in public education settings accelerated dramatically during the COVID-19 pandemic, when E-learning, the use of technology and the Internet (Sakkir et al., 2021), became essential to attempts to provide remote education to all students. However, this action did not yield the hoped-for results. Fahle et al. (2024) reported that by the spring of 2022, when states returned to regular testing, "the average student in grades 3 through 8 had lost the equivalent of half a grade level in math achievement and a third of a grade level in reading achievement" (p. 2). A year later, the authors found that students, on average, had barely recovered one-third of what they had lost.

As professors in a college of education in a southeastern state, we became aware of this situation during discussions with our graduate students in our virtual meetings and their digital literacy assignments. We repeatedly heard and read contradictory opinions and perspectives from teachers on the impact of technology and social media on their students' literacy skills. This information and the increase in the use of instructional technology during the COVID-19 pandemic prompted us to conduct the present study with our graduate students, nearly all of whom are active teachers working in urban, suburban, and rural areas. In this way, we aimed to gain a deeper understanding of the teachers' perceptions, practices, and recommendations regarding technology and the development of literacy skills.

We sought to answer the following questions:

1. What are the teachers' perceptions of the impact of technology and social media on their students' literacy skills? In their opinion, what specific students' literacy skills are hindered or enhanced by technology and social media?
2. What are the teachers' concerns about using technology and social media in the classroom, and what do they recommend?

## Effects of Technology and Social Media in the Classroom

In this study, we refer to technology as the use of computers, laptops, tablets, cellphones, or any other technological device in classrooms for instructional purposes. We refer to social media as the use of websites, applications, platforms, and other online tools where students can participate in social networks.

### Technology's Effect on Students' Learning

Research has shown that while teachers recognize the potential benefits of technology and social media in their students' learning, they also have concerns about the possible harm and challenges of technology and social media in their students' learning skills (Albashtawi & Al Bataineh, 2020; Carpenter & Krutka, 2014; Mandasari & Wahyudin, 2021; Mercer et al., 2019; Van Den Beemt et al., 2020).

Numerous studies have demonstrated the benefits of incorporating technology into classrooms. For example, Mercer et al. (2019) found that technology-mediated spaces can help support classroom dialogue and improve students' interactions. Their work with elementary students using interactive whiteboards found that creating a digital space allowed students to share ideas and co-construct knowledge. The authors also found that "using technology with a dialogic intention thus opens up new kinds of opportunities for learners and teachers publicly to share, explain, justify, critique and reformulate ideas − using language and other symbolic representations" (Mercer et al., 2019, p. 192). Specifically for English Learners (ELs), digital mediums (such as Google Classroom or Zoom) in the classroom can be an integral component for supporting their language development. These findings align with those of Albashtawi and Al Bataineh (2020) and Mandasari and Wahyudin (2021), who also found that ELs utilized these digital platforms to support their language development.

In 2022, Akram and colleagues published a literature review on teachers' perceptions of technology integration in teaching and learning. The authors presented a meta-analysis of 25 representative articles published from 2017 to 2021. The researchers found that in most studies, teachers expressed positive attitudes toward integrating technology in the classroom. They discussed the role of technology in fostering connections between students, promoting engagement, and providing learning opportunities. The authors also found that using technology increased the students' creativity and academic performance. In particular, studies conducted during the COVID-19 pandemic revealed that technology-enhanced teaching improves instructional quality, especially among teachers who received adequate training. Technology was also seen as a positive asset in enabling teachers to "share course outlines, reference materials, lesson plans, assignment submissions, assessment reports, etc." (Akram et al., 2022, p. 5).

Similarly, Picton (2019) surveyed 219 teachers in the United Kingdom to examine how educators used digital resources to enhance literacy skills. The author found that most teachers agreed that technology supports struggling students, creates a more inclusive learning environment, provides students with opportunities to participate in creative tasks, and enhances students' reading, writing, and vocabulary skills. Williams and Beam (2019) examined 29 empirical studies published in peer-reviewed journals investigating the use of technology-based instruction embedded in the writing curriculum. They found that technology encouraged motivation, student engagement, and participation in writing assignments through social interaction and peer collaboration.

However, most studies have yielded negative findings regarding the use of classroom technology. For example, Williams and Beam (2019) also discovered that teachers faced numerous challenges while integrating technology into the writing curriculum due to a lack of adequate professional training. The studies in Akram et al. (2022) discussed barriers to effectively integrating technology into classrooms, including inadequate infrastructure that prevents teachers from receiving

appropriate professional development, suitable pedagogical models, and necessary resources. Picton (2019) also identified obstacles, including the lack of training and inadequate software, tools, and resources. Picton concludes that technology can be a powerful tool to enhance students' literacy skills. However, there is a need for an "educational transformation [that] will require support from policymakers and the technology sector, in consultation with academics, educationalists, and learners" (p. 28).

It is worth noting that some studies have reported that many teachers prefer face-to-face teaching, citing that communication and active participation are more beneficial for both students and teachers (Akram et al., 2022). Picton (2019) also reported that more than half of the teacher participants believed that "non-technology-based teaching was better than or just as good as technology-based methods" (p.3).

**The Impact of Artificial Intelligence (AI) on the Classroom**

The integration of AI, and more recently, Generative Artificial Intelligence (GenAI), has become pervasive in K-12 classrooms as writing enhancement resources, whether intentionally chosen by teachers or surreptitiously used by students. Some research suggests that integrating AI can be a powerful and valuable tool for promoting students' cognitive skills, enhancing learning, and transforming education (Al-Huwail et al., 2025; Klar, 2025; Levin et al., 2025; Tabib & Alrabeei, 2024; Vu & Vu, 2024). However, research has also shown the necessity for adequate guidance in effectively using GenAI in education.

For example, Tabib and Alrabeei (2024) contend that AI can enhance cognitive and metacognitive skills when used in the classroom with a clear purpose and appropriate guidance. In the same way, after synthesizing empirical and theoretical literature, Levin et al. (2025) suggest that in order for the effective integration of AI into the curricula, teachers need to scaffold "prompt engineering (e.g., refining AI queries), multimodal projects (e.g., creating cross-media narratives), and critical evaluation of AI outputs" (p. 250). These findings corroborate Klar's (2025) results from mixed-methods research involving 106 secondary school students. Klar notes that if students are provided with specific instruction and guidelines when using a chatbot, such as "prompt suggestions and a feature to adapt the output length and language level" (p. 6), it can enhance students' interactions with the chatbot and use of GenAI capabilities. Vu and Vu's (2024) study, which involved 20 ninth-grade students, found that while AI writing tools can enhance students' creativity and aid with grammar and structure, they do not improve essential writing skills. While the benefits and risks of using AI and GenAI have been discussed and documented, there is much debate about how to address ethical considerations via teacher and student training (Al-Huwail et al., 2025; Levin et al., 2025; Tabib & Alrabeei, 2024; Vu & Vu, 2024).

**Effects of Social Media on Students' Literacy Skills**

Social media has become an integral part of our society. It is one of, if not the primary, medium for people, especially young individuals, to express their opinions and communicate globally. Social media has also been explored as an instructional tool for enhancing the teaching and learning process among students. For example, Carpenter and Krutka (2014) surveyed 755 K-16

educators in the United States to explore their perceptions of using Twitter (now X) in education. The study found that educators had a positive attitude toward Twitter and valued its role in facilitating a collaborative community. However, research has also revealed the limitations and problems associated with social media as an instructional tool. Perkins (2013) found that using Twitter can lead to poor word choice and incomplete sentences due to its maximum character count.

Similarly, Greenhow and Askari (2017) reviewed 24 studies on the impact of social networks on teaching and learning. The authors concluded that the use of social networks in education has both advantages and disadvantages; however, they also contended that there are few studies conducted in formal settings that examine the perceptions and practices of actual classroom teachers in middle or secondary school settings. Greenhow and Askari (2017) recommended that "teacher education initiatives should set up opportunities to critically evaluate recent research literature on conditions for potentially beneficial or harmful social media integration" (p.18).

After reviewing the existing literature regarding social media in educational settings from 2005 to 2016, Van Den Beemt et al. (2020) found that some teachers reported an increase in student engagement and motivation when using Facebook and Twitter in writing and language arts classes. However, the authors reported that the results regarding the positive or negative effects of using social media in the classroom were not conclusive, but rather anecdotal. Furthermore, educators also mentioned district policies, lack of support, and issues regarding students' privacy and security limited the use of social media as an instructional tool (Carpenter & Krutka, 2014; Van Den Beemt et al., 2020).

These findings in the existing research literature helped guide us as we explore what our teacher/graduate students think about using technology in the classroom.

## Method

### Research Design, Procedure, and Participants

This study employed a concurrent embedded mixed-methods research design in which the quantitative and qualitative data were collected simultaneously. During the analysis, the qualitative data served as the primary source, and the quantitative data were used to support and enrich the qualitative findings (Creswell & Clark, 2017).

A purposive sampling approach was used to recruit teachers who taught English, Language Arts, or Reading in the $4^{th}$ to $12^{th}$ grades in the Southeastern United States. A list of 757 graduate students enrolled across a wide variety of programs in our college, which served at least a few potential participants, was used to distribute our initial recruitment email broadly. That email expressed our study's narrow focus on only English, Language Arts, or Reading teachers in grades 4 to 12. The emails also informed them of the study's purpose and encouraged their voluntary participation. Two follow-up recruitment emails, two weeks apart, were sent to participants to maximize sample size. At the conclusion of the four-week recruitment period, the data files (both quantitative and qualitative) were downloaded from Qualtrics, with the quantitative data in SPSS (.sav) format.

The first page of the digital Qualtrics survey contained the informed consent form. Participants were asked to close the browser if they did not wish to participate. Seventy-five potential participants responded to the recruitment email by logging into the Qualtrics survey. Thirty of these consented to participate and finished the survey. The questionnaire was completed, on average, in 23 minutes.

Of the $N = 30$ participants, 27 identified as female. Eleven teachers reported working in a rural area, 11 reported working in a small town, four reported working in a suburban area, and four reported working in an urban area. This imbalance reflects the university's location in a rural region of our state. Further, eight teachers identified as Black or African American, one identified as multiracial, and 21 identified as White, Non-Hispanic, again reflecting the demographics of our student population.

All human subjects' ethical guidelines for social-behavioral research were followed throughout the study. University Institutional Review Board (IRB) approval was secured prior to any data collection (IRB Approval No. H24022). After receiving IRB approval, the questionnaire was transferred to the Qualtrics platform for online administration. Participants requested no personal identifying information; hence, all data were deemed deidentified for data analysis purposes.

**Materials and Instruments**

A researcher-developed 22-item quantitative questionnaire, along with five open-ended questions, was employed to collect data from participants. The questionnaire included both quantitative self-report prompts and five open-ended, qualitative questions. The five open-ended questions were designed to gauge teachers' opinions and perceptions about using technology (e.g., computers, the internet) and social media (e.g., TikTok, Facebook, Snapchat, Twitter/X) in the classroom.

The 22 quantitative prompts were similarly divided into two separate scales, each comprising 11 prompts. One scale was related to the use of technology in the classroom, whereas the other scale included prompts regarding social media use in the classroom. It is essential to note that both scales were designed to assess whether technology and/or social media enhanced students' proficiency in various literacy skills (see Appendix A).

Reliability coefficients, McDonald's ω, for each scale were 0.81 and 0.91, respectively, demonstrating high and very high reliability. The questionnaire included seven demographic prompts. The 22 prompts were rated on a 3-point Likert scale, where 1 = Hindered, 2 = Neutral, and 3 = Helped.

**Quantitative Data Analysis and Results**

The researcher most experienced in quantitative analysis methods handled his part of the analysis. Data were screened for univariate outliers using box-and-whisker plots and were tested against relevant statistical assumptions, including homogeneity of variance, linearity, and normality. The

data did not contain any extreme outliers (more than three standard deviations from the mean) and met all the requisite statistical assumptions.

Although 19 of the 22 quantitative prompts were complete across all 30 participants, a few data points were missing, with two prompts lacking one response and one prompt lacking two responses. To retain all the participants' data, a series of analyses regarding missing values was conducted on the data. Little's Missing Completely at Random (MCAR) statistics (Little & Rubin, 1983) were used to evaluate whether the missingness pattern in the data was random. An MCAR $p$-value $\leq 0.050$ indicates that the pattern is non-random and, problematically, there are systematic differences in non-responses. In contrast, an MCAR $p$-value $\geq 0.051$ indicates the inverse, that the gaps in the data are unproblematically random. The results revealed that, for both scales, the missingness pattern was random, with all MCAR $p$-value $\geq 0.816$. Therefore, the missing data could be imputed without biasing the results.

The Expectation Maximization (EM) algorithm (Tabachnick & Fidell, 2019) was employed to impute the missing data points for each scale separately. The EM algorithm is a regression-based analysis that predicts the most likely response for each missing data point by using all available observed data for each participant. It is considered a superior approach to imputing data when it is MCAR (Tabachnick & Fidell, 2019). Thus, all 30 cases were available for quantitative data analysis.

**Descriptive and Correlational**

Descriptive statistics for the technology and social media scales are displayed in Table 2. The means are based on a 3-point Likert scale, ranging from 1 (Hindered) to 3 (Helped).

**Table 2**
*Descriptive Statistics for the Technology and Social Media Prompts by Literacy Skill*

| Literacy Skill | *M* | *SD* |
|---|---|---|
| TECHNOLOGY | | |
| Reading Fluency | 1.98 | 0.55 |
| Reading Comprehension | 2.20 | 0.58 |
| Critical Thinking Skills | 1.66 | 0.50 |
| Research Skills | 2.49 | 0.54 |
| Grammatical Conventions | 1.69 | 0.53 |
| Writing Essays | 2.09 | 0.54 |
| Using Virtual Representations | 2.77 | 0.34 |
| Interpreting Visual Representations | 2.57 | 0.45 |
| Ability to Create Small Group and Individual Projects | 2.71 | 0.40 |
| Ability to Work Independently at their Own Pace | 2.60 | 0.48 |
| Ability to Orally Present Projects | 2.25 | 0.54 |
| SOCIAL MEDIA | | |
| Reading Fluency | 1.58 | 0.44 |
| Reading Comprehension | 1.52 | 0.47 |

| | | |
|---|---|---|
| Critical Thinking Skills | 1.45 | 0.47 |
| Research Skills | 1.71 | 0.54 |
| Grammatical Conventions | 1.23 | 0.32 |
| Writing Essays | 1.52 | 0.47 |
| Using Virtual Representations | 2.39 | 0.49 |
| Interpreting Visual Representations | 2.32 | 0.54 |
| Ability to Create Small Group and Individual Projects | 2.10 | 0.51 |
| Ability to Work Independently at their Own Pace | 2.03 | 0.52 |
| Ability to Orally Present Projects | 1.87 | 0.60 |

$N = 30$

As evident in Table 2, our teacher participants reported that technology broadly helped their students develop their literacy skills, with a mean for technology, $M \geq 2.20$ on 7 of the 11 prompts. On the other hand, our teacher participants reported that social media generally hindered students' ability to develop essential literacy skills, with a mean score for social media, $M \leq 1.87$, on 7 of 11 prompts.

The two prompts that best exemplified this dichotomy were Reading Comprehension ($M = 2.20$ vs. $M = 1.52$) and Research Skills ($M = 2.49$ vs. $M = 1.71$), both of which manifested large inversions across the two scales. A smaller inversion ($M = 2.25$ vs. $M = 1.87$) was found regarding the Ability to Orally Present Projects.

On both scales, Using Virtual Representations was identified as the skill best supported by both technology and social media. This is unsurprising because it is, by definition, a technological task. Also among the highest means in both scales was the closely related skill of Interpreting Visual Representations, which is increasingly taught electronically in the classroom. Weaker double positives were found regarding the Ability to Create Small Group and Individual Projects and the Ability to Work Independently at their Own Pace, with the support of technology far outstripping social media.

Also on both scales, teachers identified Critical Thinking Skills and Grammatical Conventions as the areas of literacy most negatively impacted by both technology and social media. Substantial negative impacts upon Reading Fluency and Writing Essays were attributed to social media, but not to technology in general. Many of these quantitative findings will be addressed by our qualitative data.

## Qualitative Data Analysis and Results

The two researchers with the most experience in qualitative analysis examined this data. Data were analyzed, recursively coded, and classified using a descriptive and interpretive approach to elucidate themes (Vaismoradi et al., 2016). After reading the responses of all participants separately, the researchers conducted initial coding using keywords from the quantitative survey and descriptive phrases related to the research questions. Initially, the data were classified into ten different labels. After analyzing the initial set of labels, the researchers merged and combined some

of the interrelated labels and reclassified the codes. After the second coding round, the researchers identified five themes (see Appendix B).

## Findings

The study identified five dominant themes within the qualitative data. This section presents the findings based on the research questions that guided this study. Three themes are related to the Research Question 1: *What are the teachers' perceptions of the impact of technology and social media on their students' literacy skills? In their opinion, what specific students' literacy skills are hindered or enhanced by technology and social media?* The following three themes will be discussed below, supported by quotes from the participants.

### Technology Facilitates Reading Comprehension and Differentiation

Our participants' responses to open-ended questions elaborated that reading comprehension is enhanced in two ways by technology: by offering teachers the ability to differentiate and even individualize instruction for students, and by providing students with choice in their learning. This aligns with our qualitative analysis, wherein participants agreed that technology, but not social media, facilitates students' reading comprehension. Participants referred to several programs as ways they had utilized technology to integrate and enhance reading instruction and assessment in their classrooms. They cited these technologies as being instrumental in facilitating reading comprehension. By allowing students choice in their learning and facilitating individualized/differentiated learning, our participants praised technology as a tool that can have a positive effect on a literacy curriculum, especially reading comprehension.

One participant stated, "We use an online program for reading comprehension with our SPED students. It has greatly enhanced their reading comprehension levels. We also use Google Classroom to allow students to work at their own pace." Technology offers ease of differentiation and individualization for reading instruction, enabling students to work at a self-directed rate. As stated, one participant uses the technology-based tool, "Readworks to allow students to independently practice their reading comprehension skills and provide feedback." Furthermore, participants noted that they have been able to use other technology-based tools to differentiate more effectively. They stated that students utilize i-Ready, IXL, and Read180 software to meet their goals and engage in targeted instruction tailored to their individual learning needs. They argued that technology can offer a "personalized learning pathway that addresses [students'] individual literacy needs."

Beyond facilitating reading comprehension through differentiation and individualization, technology allows students to make choices about their learning. With multiple entry points and pathways, technology offers students the opportunity to guide their own learning through a multitude of options, opportunities, and resources, as "technology opens new possibilities for communication and information" (Leu et al., 2004, p. 1570). Some participants spoke positively about technology's fast access to a wide range of materials, such as "expos[ing] students to multiple genres of text in an instant." Other participants mentioned how some of their students preferred technology-based reading materials to traditional ones. One participant responded that,

> Technology has helped my students' reading skills because we use several software to have them read. A lot of my students don't want to read a paperback book. They prefer to use the software SORA because they have access to read-aloud books, ARC (American Reading Company) Bookshelf app, and we use a Read 180 software called Reading Counts to have them test what they read.

Students are motivated to read when given choices (Schiefele et al., 2012; Wigfield et al., 2016). The integration of technology expands the range and frequency of student options when reading digitally or working on collaborative projects (Schmar-Dobler, 2003; Van Den Beemt et al., 2020; Williams & Beam, 2019).

**Technology and Social Media Decrease Basic Writing Skills**

Despite technology's many positive attributes, two negative themes arose in our participants' open-ended responses. As our qualitative analysis indicated, our participants repeatedly asserted that students' basic writing skills, especially attention to grammatical conventions, are diminished by technology, especially social media. Several facets of students' writing abilities have suffered, as mentioned by one participant,

> I've noticed a decrease in reading and writing stamina. I have noticed a significant decrease in spelling and grammar knowledge, which affects writing. Difficulty with word recognition and decoding skills have affected reading fluency which causes difficulty with reading comprehension.

In their qualitative commentaries, our participants provided several causative rationales for this decrease in students' writing abilities, including (a) lack of physical books and pencil-paper based graphic organizers, which serve as models for students' writing, (b) reliance on technology-based tools to perfect conventional writing skills such as capitalization, punctuation, grammar, and spelling, (c) poor technology-based writing examples such as text messaging, which leads students to use abbreviations and provide shorter written responses and a reliance on "text talk" and slang instead of using proper grammar.

These statements align with other research-based findings regarding technology-enhanced literacy instruction. Teachers often experience difficulty when faced with contemporary students' lack of basic writing skills and limited writing abilities in general (Vu & Vu, 2024). However, research suggests that incorporating technology into writing instruction, when properly structured, can motivate students by facilitating social interaction and peer collaboration, as well as supporting composing and processing skills (Williams & Beam, 2019; Vu & Vu, 2024). The difficulty lies in teachers' ability to use technology effectively to enhance students' writing. This significant discovery suggests that teachers require timely and relevant professional development to enhance their ability and attitudes regarding teaching writing effectively using technology (Akram et al., 2022; Picton, 2019; Williams & Beam, 2019).

**Critical Thinking Skills Undermined by Google Search and AI**

The third theme derived from the participant responses centered on students' reliance on technology and social media and how this reliance negatively impacts their critical thinking skills. This critique was also documented in our quantitative data. Some participants noted that students have become increasingly dependent on technology rather than building their own knowledge and skills. One participant wrote, "When posed with questions on paper, I have caught students typing the question into Google and writing down the first answer they see. Rather than forming an answer independently, they are using someone else's thoughts." Other participants were also concerned that their students were relying too heavily on technology for answers, rather than presenting their own ideas, particularly by copying and pasting the work of others. As stated by another participant, "continued access to such a vast amount of information has formulated students that don't know how to create, critically think, or figure out answers and responses themselves. They want it spoon-fed to them." This critique was also documented in our quantitative data.

Research consistently reiterates the effectiveness of technology in the classroom in enhancing many teaching and learning processes. However, students should utilize this tool to access information, critique and synthesize that information to create new knowledge, and share it globally. Rather than copying and pasting what is found online, students should be taught to "interpret and respond to information from multiple social and cultural contexts that share profoundly different assumptions about our world" (Leu et al., 2017, p. 6). Therefore, educators must prepare their students "to think critically, interpret the meanings they find on the Internet, and communicate with others" (Leu et al., 2017, p. 6). Additionally, Leu and colleagues (2017) reiterate the importance of promoting critical thinking skills in students, as they are central to students' interaction with New Literacies and technology. Although critical thinking skills have always been integral within the literacy curriculum, innovative technologies and communication are complex, and "new social practices will be needed in classrooms to interact within increasingly complex technologies for information and communication" (Leu et al., 2017, p. 7). Therefore, the literacy curriculum will require teachers to offer a range of new strategies to help students succeed within a technology-based curriculum.

Two themes were identified that respond to Research Question 2: *What are the teachers' concerns about using technology and social media in the classroom, and what recommendations do they offer?* These two themes will be discussed in detail and supported with quotes from our participants.

**Teaching Students How to Evaluate Sources and Detect False Information**

Our teachers expressed great concerns about their students' access to false and harmful information within the immense amount of information they are exposed to daily, both inside and outside the classroom. Our participants' qualitative responses indicated that they blamed social media for this exposure and consequent undermining of research skills. For example, some of their comments were:

> "So much false information is presented as facts by so many people and organizations."

> "Students are inundated with large amounts of information, much of which may be inaccurate or misrepresented."
> "The media does not explain the information and what is happening."
> "Instead of objective viewpoints, users are constantly subjected to the simplistic, thoughtless opinions of everyone on said platforms."

Teachers' concerns extended beyond inaccurate information to encompass the emotional well-being of students. One participant wrote, "Many teenagers do not know how to spot credible sources and are easily swayed by misinformation that pervades social networks." Another participant was even more assertive regarding social media and students' mental health: "Social media has warped their minds and given them a false sense of reality."

The participants also noted that they are responsible for teaching students how to critically evaluate websites. One of them stated that "Students truly have to be taught to be critical observers of these pages and pushed to fact-check all information." Commonly, participants asserted that they were not only in charge of teaching grammatical conventions and academic writing, but they also had "to correct the misconceptions students have gained from social media."

As a result, participants shared ways in which they have effectively used social media to teach students critical awareness and how to evaluate sources. One of the teachers mentioned that she showed her students "examples of 'fake news' and showed them the importance of checking facts. We used Wikipedia, Facebook, and YouTube." With examples like this, teacher participants believed that technology should be used to challenge falsehoods in social media.

With the increased use of technology in the classroom, it has become essential for teachers to intentionally teach students how to find and synthesize information and "critically evaluate the information they found" (Leu et al., 2004, p. 1576). This theme demonstrated the participants' awareness of their responsibility to teach their students the necessary skills to become digitally and critically literate citizens in our always-evolving global society.

**Appropriate Use of Technology Can Nurture Creativity and Literacy Skills**

Research has found that when technology is not used purposedly and with adequate guidance, it has the potential to hinder students' literacy skills, especially writing and reading (Albashtawi & Al Bataineh, 2020; Al-Huwail et al., 2025; Carpenter & Krutka, 2014; Mandasari & Wahyudin, 2021; Mercer et al., 2019; Van Den Beemt et al., 2020; Vu & Vu, 2024).

The final theme was focused on the participants' opinions regarding the effective use of technology in the classroom. The teacher participants considered technology an excellent tool for advancing their students' literacy skills, provided it is used appropriately. For example, one of the participants stated, "Technology in the classroom is a gift. We just need to make sure we are using it intentionally." Another stated, "I feel that with adult supervision of technology, it is a wonderful and necessary method to use in education." They argued that using technology with a clear purpose and training can benefit students and help promote reading and writing skills. The participants shared how technology and social media have benefited their students.

For example, the teachers praised Read 180, System 44, and i-Ready as effective ways to "differentiate instruction tailored to each child's individual need" and "help students with fluency and comprehension." Similarly, the participants also shared how the focused and well-thought-out use of technology and social media has benefited their students. For example, they mentioned how Blogs, YouTube, Vlogs, and podcasts have enhanced their students' engagement in literacy and writing "because it is relevant to their day-to-day lives and interests." Students are exposed to "different topics from YouTube to help my students," and "social media could help students be exposed to more ideas that they may become inspired to read about."

Special emphasis was placed on how technology in the classroom promotes creativity among students, allowing teachers to "add computer games for specific skills, have students create Docs, Slides, and create video clips." They also noted that technology and social media have helped facilitate collaborative projects and presentations that demonstrate enhanced visual and oral literacy skills among their students. In addition, they mentioned that "YouTube and Vlogs gave students a creative and relatable outlet to display knowledge and the skills they are learning." This aligns with our quantitative findings, which indicate that our participants viewed both technology and social media as enhancing student use and interpretation of virtual and visual representations. These findings also corroborate and expand on research that has demonstrated the positive impact of technology in the classroom on students' interactions, creativity, and academic performance (Akram et al., 2022; Picton, 2019; Tabib & Alrabeei, 2024; Vu & Vu, 2024). Below are a few specific ideas lauded by the participants.

- "Create a fake Instagram post to show significant events in stories we read. This helps increase engagement."
- "Use TikTok to create 'Book Toks.' Using this tool made my students read the book, rate it, and persuade their audience to read the book."
- "Use Instagram as a tool to allow students to demonstrate their understanding of character traits and summarizing. It activates critical thinking and research skills. Example: Let us look at this person's Instagram. What inferences can you make about this person? How can you prove it?"

Overall, our participants' open-ended responses demonstrated that they support using technology to enhance education, but within limits and not as the sole teaching strategy. "Technology can be useful for instruction and learning, but students/teachers must use it as a tool, not as a substitute for instruction," stated one participant. Another teacher contended that "There needs to be restraints set in place on how much time is spent on technology," arguing that sometimes students get distracted and do not take their work seriously. Regarding the time spent on technology, the participants asserted that they should combine traditional teaching methods with technology to enhance learning. One noted that "a healthy balance of each [technology and traditional teaching] may complement each other and improve students' learning and literacy." These findings align with Picton's (2019) research, which found that some teachers believed instruction without technology could be as effective as, or even better than, technology-based instruction.

## Discussion, Implications, and Recommendations

The following section presents a discussion of the five themes identified from the qualitative data, along with their implications and plausible recommendations. Two themes focus on the positive aspects that teachers in this study found when implementing technology and social media in the classroom: Technology Facilitates Reading Comprehension and Differentiation, and Appropriate Use of Technology Can Nurture Creativity and Literacy Skills. The three remaining themes focus on some concerning issues teachers identified regarding technology and social media in the classroom: Technology and Social Media Decrease Basic Writing Skills, Critical Thinking Skills Undermined by Google Search and AI, and Teaching Students How to Evaluate Sources and Detect False Information.

**Positive Effects of Integrating Technology and Social Media into Classroom Instruction**

As mentioned in the findings, teachers agree that technology usage in the classroom helps facilitate students' reading comprehension in two ways: by enabling teachers to differentiate/individualize instruction for their students, and by providing students with choice. Research has shown that choice motivates students to read (Schiefele et al., 2012; Wigfield et al., 2016). Furthermore, integrating technology enhances the range of choices students have when reading and/or when on individual or collaborative projects (Schmar-Dobler, 2003; Van Den Beemt et al., 2020; Williams & Beam, 2019).

Additionally, technology enables teachers to individualize and differentiate instruction more easily and effectively for students. Due to its multiple entry points and pathways, technology enables students to navigate their learning through numerous options, opportunities, and resources. In this way, "technology opens new possibilities for communication and information" (Leu et al., 2004, p. 1570).

Thanks to these multiple pathways, technology and social media also have the potential to enhance students' literacy skills and creativity. Research suggests that incorporating technology into the classroom can enhance students' interactions, creativity, and academic performance (Akram, 2022; Picton, 2019; Tabib & Alrabeei, 2024; Vu & Vu, 2024). Furthermore, technology can bring students together beyond the physical barriers of a classroom or within the confines of a school day. Students can continue to collaborate on group activities in various spaces and at different times. Also, the facility with which visual and virtual representations can be manipulated using technology facilitates creative understanding and presentations of knowledge.

Thus, for some purposes, our teacher participants considered technology, and sometimes social media, to be practical tools for advancing their students' literacy skills when used appropriately. Research suggests that technology and/or social media can also be motivating and useful tools when used appropriately and intentionally; however, they can also hinder some literacy skills. (Williams & Beam, 2019; Vu & Vu, 2024).

**Negative Impacts of Technology and Social Media upon Teaching and Learning**

Along with the above positive attributes, three negative themes regarding the impact of technology and social media on literacy education emerged from our qualitative findings. Our quantitative data corroborated these findings. Based on our findings, it is essential to highlight how technology and social media usage decrease students' basic writing skills, critical thinking skills, and ability to evaluate sources and detect false information. To reverse these impacts, teachers must be provided with adequate and relevant professional development on the effective use of not only technology and social media, but also increasingly pervasive versions of AI and GenAI.

## The Need for Professional Development

Following the mixed reviews from our teachers regarding the use of technology and social media in the classroom, along with their recommended activities that effectively integrate these tools, we assert the necessity for professional development focused on the strategic and systematic use of these tools in the classroom. Teachers need guidance and time to properly integrate these tools and discover their potential while countering the negative potential outlined in this study.

### *Focus on Students' Development of Critical Thinking*

A special focus of such professional development should be on developing students' critical thinking skills. In all aspects of traditional reading instruction, teachers focus on students' ability to think critically and analyze texts. The same should be true for literacy instruction incorporating technology and social media. Students should also be taught critical thinking skills when prompting AI and GenAI and learn that technology and social media are tools for literacy instruction and cannot replace students' ability to think critically, only enhance it (Picton, 2019; Schmar-Dobler, 2003; Van Den Beemt et al., 2020; Williams & Beam, 2019).

### *Focus on Students' Development of Metacognitive Skills*

Professional development in metacognitive skills would be beneficial for teachers to help their students develop critical thinking skills. Flavell (1979) originally coined the term "metacognition" and defined it as higher-order thinking processes in which one's cognition is the subject of regulatory and monitoring processes. Schraw and Moshman (1995) subsequently expanded the concept. They provided specificity to the construct by postulating that metacognition involves metacognitive experiences (e.g., episodes in which people are self-aware and mindful of tasks, environments, affect, and others), metacognitive knowledge (e.g., knowledge of oneself as a person, including habits, strengths, shortcomings, etc., that help people to succeed in tasks), and metacognitive skills (e.g., emotion regulation, mindfulness, self-generated feedback, self-questioning, planning, information management strategies, monitoring, debugging strategies, and evaluation). To this end, technologies such as generative AI and gamified learning environments embedded within social media can help educators develop, train, and foster students' metacognitive knowledge, experiences, and skills. Authentic scenarios, for instance, can be designed to model effective and practical regulatory and monitoring skills in students, thereby enhancing their learning outcomes. One project, MetaCog, uses GenAI within a gamified learning environment to first learn about the user (Author et al., under review) and then train students in the metacognitive skills in which they are weak, followed by those in which they are average.

### *Focus on Social-Emotional Learning*

Several participants expressed concerns about technology, particularly social media, endangering students' mental health outside the classroom. “Addressing students’ social and emotional needs is vital, and it should be a priority for all teachers [as these skills] directly influence students’ academic ability” (Savitz et al., 2021, p. 253). Students need more social and emotional learning focused on the impacts of technology and social media on their identities and self-images. As previously mentioned, technology and social media offer students’ opportunities to communicate and collaborate beyond school hours and locations. Unfortunately, without these confines, social media often accelerates, amplifies, and conceals the bullying and abuse teachers monitor during the school day. Therefore, in addition to instructing students about dubious information sources for academic work, teachers should also address the unfair and inaccurate nature of much of the personal information encountered on social media. Then, teachers and students can engage in social-emotional learning conversations seeking to establish less-damaging norms on their shared social media.

## Limitations

Although this study is limited to data from 30 teachers from 4$^{th}$ through 12$^{th}$ grade, these findings align with the opinions of teachers we have heard and read during our years of work with in-service teachers in our graduate programs. Nonetheless, this study has limitations. The researchers suggest conducting further research to confirm or refute the findings in this study using a larger sample size and extending the study to other states and regions. Additionally, future research is needed on how to plan and implement instructional uses of social media, technology, and especially AI and GenAI, that increase both students’ motivation and their development of literacy skills.

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## Appendix A

Technology, Social Media, and the Development and Proficiency in Literacy Skills Questionnaire

1. How has the use of TECHNOLOGY (computers, the internet) IN YOUR CLASSROOM helped or hindered your students' development and proficiency in the following literacy skills:

| | Helped | Neutral | Hindered |
|---|---|---|---|
| a. Reading fluency | | | |
| b. Reading comprehension | | | |
| c. Critical thinking skills | | | |
| d. Research skills | | | |
| e. Grammatical conventions | | | |
| f. Writing essays | | | |
| g. Using visual representations | | | |
| h. Interpreting visual representations | | | |
| i. Ability to create small group and individual projects | | | |
| j. Ability to work independently at their own pace | | | |
| k. Ability to orally present projects | | | |

Can you share HOW TECHNOLOGY IN YOUR CLASSROOM has helped or hindered your students' literacy skills (especially reading, writing, and visually representing)?
Please mention any specific software or other technology-based programs implemented in your classroom.

_____
_____
_____

Can you share HOW OTHER TECHNOLOGIES OUTSIDE THE CLASSROOM (e.g., video games, YouTube, VEMO, Blogs, Vlogs, Podcasts, etc.) have helped or hindered your students' literacy skills (especially reading, writing, and visually representing)?

_____
_____
_____

2. How has SOCIAL MEDIA helped or hindered your students' development and proficiency in the following literacy skills:

| | Helped | Neutral | Hindered |
|---|---|---|---|
| a. Reading fluency | | | |
| b. Reading comprehension | | | |
| c. Critical thinking skills | | | |
| d. Research skills | | | |
| e. Grammatical Conventions | | | |
| f. Writing essays | | | |
| g. Using visual representations | | | |
| h. Interpreting visual representations | | | |
| i. The ability to create small group and individual projects | | | |
| j. The ability to work independently at their own pace | | | |
| k. The ability to orally present projects | | | |

Can you share HOW SOCIAL MEDIA has helped or hindered your students' literacy skills and proficiency?

_____
_____
_____

Have you used SOCIAL MEDIA as an INSTRUCTIONAL TOOL? If so, HOW? Did it help? HOW? Please mention which platforms you used.

_____
_____
_____

Final Thoughts? _____
_____
_____
_____

 

**Appendix B**
**Coding**

| | | | |
|---|---|---|---|
| Q. 1 What are the teachers' perceptions of the impact of technology and social media on their students' literacy skills? In their opinion, what specific students' literacy skills are hindered or enhanced by technology and social media? | First Round of Coding | Second Round of Coding | Theme |
| | Technology Helps Reading Comprehension --Provides Choices | Technology Helps Reading Comprehension -Provides Choices Independent Practice and Differentiation | Technology Facilitates Reading Comprehension and Differentiation |
| | Independent Practice and Differentiation | | |
| | Technology and Social Media Hinder Writing | Technology and Social Media Hinder Writing | Technology and Social Media Decrease Basic Writing Skills |
| | Critical Thinking Skills Restricted by Google Search and AI | Critical Thinking Skills Restricted by Google Search and AI | Critical Thinking Skills Undermined by Google Search and AI |
| Q. 2 What are the teachers' concerns about using technology and social media in the classroom, and what do they recommend? | First Round of Coding | Second Round of Coding | Theme |
| | Technology Should Be Used Purposely to Enhance Students' Skills and Engagement | Technology Should Be Used Purposely as an Instructional Tool to Enhance Students' Skills and Engagement<br><br>Using Technology and Social Media to Promote Creativity Among Students | Appropriate Use of Technology Can Nurture Creativity and Literacy Skills |
| | Social media and Technology Expand Students' Options for Creative Work<br><br>Using Social Media as an Instructional Tool | | |
| | Technology and Social Media Provide Access to False Information | Teach Students How to Evaluate Sources and Detect False Information | Teaching Students How to Evaluate Sources and Detect False Information |
| | Teaching Students How to Evaluate Sources | | |

Journal of Literacy and Technology
Volume 26, Number 3: Winter 2025
ISSN: 1535-0975


# Emojitism: A Condition Suppressing Digital Communication

Turja, Tuuli
tuuli.turja@tuni.fi
Tampere University, Faculty of Social Sciences
Kalevantie 5, 33014 Tampere, Finland
tel. +358 44 4847121
ORCID: 0000-0001-7815-9511

## Abstract

This essay introduces *emojitism*—a new concept referring to a condition in which children and adolescents are expected to participate in digital discussions but are unable to do so because of a psychological barrier of anxiety. Instead, they turn to emojitism, the restrictive use of emojis by which written words are replaced, and communication is reduced to ready-made images. Emojitism lies between social withdrawal and self-produced expression by providing a middle ground allowing social participation in a minimalistic manner. Thus, emojitism can also be viewed as a strategy for masking social anxiety and can hinder the development of both digital literacy and meaningful communication. Research is required to understand the implications, identify warning signs, and develop interventions to support individuals experiencing emojitism, particularly those at risk of social isolation. Emojitism is of great educational importance, as it sheds light on the impact of social anxiety on digital communication and education.

*Keywords: digital communication, emoji, replacement behavior, social phobia, special education*

## Introduction

Social networking technologies require that children and adolescents possess digital literacy to be able to use social media, email, schools' messaging platforms, and other communication applications. Using emojis is part of digital literacy, which, by definition, requires a basic understanding of digital communication and the use of technology. Emojis are graphical icons or symbols that complement digital communication by expressing gestures, tone of voice, and affective reactions (Bai *et al.*, 2019; Egbert et al., 2022) and are considered a form of multimodal public writing (Gray & Holmes, 2020). Using emojis in a digitally literate way requires an understanding of online social norms and consideration of the context, purpose, and recipient of a given message.

Digital literacy is important not only for using and managing social media and communication applications but also for forming and maintaining personal online identities and meaningful relationships (Cunningham, 2014; Feerrar, 2019) In online environments, besides expressing one's true identity, it is also easy for one to conceal one's true self. Social networking platforms allow individuals to present themselves in ways that differ from how they may feel. Impression management, referring to the possibility of individuals appearing in a manner that does not represent their authentic selves or hides their true feelings, is easier in online environments than in face-to-face communication (Scott & Fullwood, 2020). In the masking type (Ekman, 1978) of impression management, an individual can hide their sadness behind a smiley-face emoji.

Social networking technologies can impact children's and adolescents' well-being through dynamic and inconsistent mechanisms (Livingstone, 2019; Petersen *et al.*, 2020; Rasi *et al.*, 2019). While technology-mediated interaction and online communication are sometimes considered welcomed options for people suffering from social anxiety (Petersen *et al.*, 2020; Tate & Zabinski, 2004; Yen *et al.*, 2012), studies have shown that online interaction can also cause social anxiety (Probst, 2017; Woods & Scott, 2016).

Drawing on the dynamics of online well-being and impression management, this conceptual essay introduces the term *emojitism* as a form of masking in which digital communication is suppressed due to social anxiety and then camouflaged through the use of ready-made emojis. In emojitism, normative *emojication* is distorted by symptoms of selective mutism, resulting in an expression-constricted condition related to social anxiety.

## From Emojication to Emojitism

Emojication is a communication style in which written words are not merely complemented but replaced by emojis (Urban Dictionary, 2013). In extreme cases of emojication, messaging is entirely restricted to emojis. Thus, although emojis are usually viewed as paralingual elements enriching written communication (Bai *et al.*, 2019; Egbert et al., 2022), emojication can have the opposite effect when communication is reduced solely to emojis. Although an emoji is arguably not worth a thousand words, our digital culture has embraced emoji use to a point where it has diluted self-expression (Gaines, 2022).

By proposing the concept of emojitism, this essay aims to encourage research on how emojication is linked to selective mutism and other forms of social anxiety. Selective mutism refers to the inability to express oneself verbally despite the absence of physiological or linguistic impediments (e.g., dysphasia). Selective mutism is an anxiety disorder closely associated with social phobias. Distinctively, its symptoms are context-dependent (Capobianco *et al.*, 2017). Individuals who suffer from selective mutism can speak and initiate discussions in certain social environments but are unable to do so when in unfamiliar places and/or in the presence of certain people (Sharp *et al.*, 2007). In selective mutism, the motivation to interact coexists with powerlessness in expressing oneself verbally due to social anxiety.

Social anxiety online appears in the form of passive use of social media. Instead of posting content themselves, children and adolescents suffering from social anxiety tend to follow other people's posts and online discussions without actively contributing to them (Alkis *et al.*, 2017; Scott *et al.*, 2022; Shaw *et al.*, 2015). Whereas this kind of inhibited online behavior often goes unnoticed, there are also digital communication situations in which refraining from interaction is more apparent. For example, dialogue is expected in situations in which "everyone's opinion" is requested in a class chat or when a teacher posts an addressed inquiry on a learning platform. If a response contains only a reactive emoji when it is expected to contribute to the discussion in a more substantial manner, this can be considered emojication in its negative sense. Although emojis were developed to complement the modalities of written communication, their use allows one to contribute to a discussion with minimal input—a grunt, so to speak.

Emojication does not necessarily imply specific symptoms. However, if communication is reduced to the use of emojis because of an inability to express oneself with self-produced thoughts, it bears similarities to selective mutism. In this line of thought, emojitism refers to a condition in which an individual is expected to participate in a discussion but is incapable of doing so because of a psychological barrier unrelated to physiological or linguistic problems (e.g., dyslexia). For example, in a group chat in which a student may wish to participate but cannot overcome a mental barrier, they may attempt to control the situation using a ready-made emoji.
\

## Premises of Emojitism

On one hand, frequent reliance on emojis may constrain the development of conventional communication skills, particularly in written expression (Al-Garaady & Albuhairy, 2021). On the other hand, a more concerning pattern emerges when individuals appear unable or unwilling to communicate through any means other than pre-formed emoji symbols. In such cases, this restricted mode of interaction may signal deeper challenges, such as social phobia or anxiety-related communication difficulties (Ju & Zhao, 2024).

Experiences and fear of embarrassment play a significant role in social anxiety (Clark & McManus, 2002). It is plausible that in selective mutism, as well as in emojitism, fear of appearing awkward or saying something shameful and regretful prevents the expression of one's feelings and thoughts. Using a ready-made emoji can be viewed as a more secure, neutral, and face-saving option, as well as a replacement behavior, whether intentional or not. Thus, emojitism lies between total social withdrawal and self-produced expression of thought by providing a middle ground where one can contribute to a discussion in a minimalistic manner. In its intentional form, emojitism can be used to mask social anxiety (Brian *et al.*, 2019) by allowing an individual to be reactive without contributing a single word while creating the illusion of unproblematic interaction.

The concept of social masking originates in autism studies. Individuals on the spectrum may attempt to minimize the signs and symptoms of their condition in social situations, for example, by suppressing their expressions or compensating for a certain expected behavior with a replacement behavior (Hull *et al.*, 2017). Instead of acting as a supportive force in online interactions, masking is more likely to add negative stress (Korzynski *et al.*, 2021). This is especially relevant for special education. For an individual on the spectrum who attempts to "pass as an average person", social masking can be exhausting and even identity-threatening (Cook *et al.*, 2021).

As an important difference, the symptom-like condition emojitism is distinct from using emojis in a constructive way in special education. In selective mutism, individuals tend to use alternative methods of communicating, obvious examples being writing and using symbols instead of speaking. In a positive trajectory, the use of emojis can be a therapeutic socialization method employed as the first step toward learning to express oneself online (Ma *et al.*, 2020). Conversely, in a negative trajectory (i.e., emojitism), the use of emojis can lead to increasingly diminishing social interaction.

The first premise of emojitism is that the use of emojis does not enrich written communication, as originally intended, but reduces communication to ready-made images. Second, emojis are primarily used not as complements to self-expression but as a replacement behavior. Emojitism is thus a strategy of masking the inability to communicate in a more elaborate way. Third, emojitism is distinct from the therapeutic method of using symbols to support social skill development for individuals with social anxiety or other special needs. On the contrary, emojitism enables an individual to regress to diminished communication instead of finding the confidence to express their thoughts in more diverse ways.

## Future Outlooks

Digital communication reduced to emoji use can be a sign of poor digital literacy or, in the worst-case scenario, social anxiety. In both cases, excessive and restrictive emoji use is a possible barrier to the educational endeavor to prepare children and adolescents to become potential public writers (Gray & Holmes, 2020). Emojitism stemming from social anxiety represents an even more serious challenge for special education. Besides conventional therapy, education on digital and social media literacies may be recommendable. Special education students have been found to be a group that benefits greatly from social media literacy education in general (Probst, 2017).

The possibility of impression management underlying emojitism highlights the need to encourage students to adopt a more elaborate communication style. As an evasive behavior, emojitism may lead children and adolescents who experience social anxiety to deny their condition, which can prevent them from learning how to express their true feelings and identities (Becker-Lindenthal, 2015). The primary objective in the care of children and adolescents suffering from selective mutism is to encourage them to engage in social interaction. It is important for these individuals themselves to understand the reasons and processes that underlie the condition and to find ways to be more active in their self-expression (Zakszeski & DuPaul, 2017). It is considered counterproductive to attempt to force an individual with mutism to talk or to speak on their behalf (Cotter *et al.*, 2018; Kehle & Bray, 2009). Speaking on the individual's behalf refers to how an attempt to protect the child by taking their speaking turns most likely results in a social environment that only promotes selective mutism. Ideally, both informal everyday support and formal therapy should jointly aim to change the trajectory of mutism and its progression to social isolation (Sharp *et al.*, 2007).

The gradual progression to social isolation is the main reason that research and interventions concerning emojitism are similarly warranted. What we know about social anxiety underlines the importance of early interventions. Selective mutism and social phobias in general tend to spiral down to more extreme social isolation (Holka-Pokorska *et al.*, 2018; Sluckin & Smith, 2015). Because of the normative use of emojis in our culture (Gaines, 2022), masking social anxiety with emojication is effective in creating the illusion of true dialogue. Even selective mutism has been shown to be difficult to identify (Sharp *et al.*, 2007) and the history will repeat itself if symptom-like withdrawal from social interaction remains disregarded in digital environments because communication seemingly meets the minimum standards.

As the field of internet research struggles to even standardize a scale for online well-being (Ong *et al.*, 2021), emojitism may be a particularly challenging symptom to detect. A recommendable starting point would be to combine online and offline observations. By doing so, symptom-like emojitism could be considered in cases in which an individual has already shown signs of deteriorating verbal communication. The next step toward building a theory of emojitism requires empirical evidence associating emojitism with parallel symptoms of social anxiety. Future studies should examine their potential relationship to answer the question of whether emojitism may be a legitimate sign of minimized communication caused by social anxiety.

We need to advance ways to measure and understand the signs of social anxiety on various onymous and anonymous digital platforms (Petersen *et al.*, 2020). In the diverse social networking environment (Bai *et al.*, 2019), emojitism is especially relevant in forms of onymous digital communication. While certain social media platforms offer the possibility of communicating anonymously, using pseudonyms, onymous and personal messaging entails a higher demand for active participation. Without the ability to meet this demand, individuals are more likely to resort to replacement behaviors, such as emojitism.

## Conclusion

This essay introduces the concept of emojitism, referring to a form of digital communication constrained to the use of pre-made emojis, potentially as a result of social anxiety or, in milder cases, limited digital literacy.

Future research on emojitism should investigate its potential as a behavioral indicator of social anxiety, particularly in children and adolescents. Empirical studies are needed to establish whether emojitism correlates with reduced verbal expression and other symptoms of social withdrawal. Special attention should be paid to its implications for special education and the development of digital and social media literacies. Ultimately, research should aim to clarify whether emojitism represents a maladaptive coping strategy and how it might be addressed through early interventions.

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