



## Exploring EFL Learners' Perceptions of Capital in AI-assisted Academic Writing: An Investment Model Perspective

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**Abstract:** Drawing on [Darvin and Norton's \(2015\)](#) Investment Model, this qualitative study explored how Iranian undergraduate non-English majors perceive the role of GenAI tools in mediating access to different forms of capital and shaping their investment in English academic writing. Qualitative data were generated from 75 participants across diverse academic disciplines through 65 written interviews, 10 semi-structured oral interviews, and 10 reflective diary reports, and were analyzed using [Braun and Clarke's \(2006\)](#) Reflexive Thematic Analysis (RTA). The analysis revealed six themes, representing that the learners' investment in AI-assisted academic writing was mediated through multiple forms of capital. The analysis of the data indicated that GenAI functioned as a source of *pedagogic-material* capital by providing instructional support, linguistic feedback, and reusable writing resources that facilitated academic writing, although participants also recognized the need to critically evaluate AI-generated outputs. AI further enhanced *psychological* capital by increasing writing confidence and reducing anxiety, while raising concerns about overreliance, diminished authorial voice, and reduced independent learning. *Embodied* capital, including English proficiency, prompt-crafting skills, disciplinary knowledge, and AI literacy, shaped the learners' ability to engage critically with AI. AI also reconfigured *social capital* by fostering collaboration and knowledge sharing while reducing interpersonal interaction and, at times, creating feelings of disconnection. *Institutionalized* capital both enabled access to academic writing conventions and constrained investment through limited institutional support, ambiguous AI policies, and inconsistent instructor attitudes. Finally, unequal access to technological resources and infrastructural constraints highlighted the role of *digital-economic* capital in shaping the learners' investment, while revealing both experiences of educational inequality and adaptive resilience.

**Keywords:** Academic Writing, GenAI, Investment, Iranian EFL Learners, Capital.

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## Introduction

Research in EFL contexts reveals that learners with comparable levels of linguistic proficiency often demonstrate markedly different patterns of engagement with academic writing (Shen et al., 2025). From a socio-discursive perspective, academic writing is conceptualized as a socially-situated meaning-making practice that requires deep learner engagement with language, discourse, and knowledge construction within disciplinary communities (Hyland, 2004). However, such deep engagement with writing is not solely predicted by language competence (Shen et al., 2025). While some learners invest sustained effort, others disengage or avoid participation altogether, indicating that investment in academic writing extends beyond linguistic ability (Mun, 2024). This issue has gained renewed relevance with the growing incorporation of technologies into academic contexts.

Recent research suggests that technological affordances may mediate learners' social relations as well as their understanding of practices and experiences of academic writing (Fathi & Rahimi, 2024; Tafazoli & McCallum, 2025). Within Applied Linguistics (AL), the concept of *investment*, extending the traditional notion of motivation which primarily foregrounded cognitive and affective dimensions (Gardner, 1985), offers a lens for examining these social processes by attending to how language learning is intertwined with power, access to resources, identity formation, and capital, all of which influence learners' opportunities for participation and their positioning within broader social structures (Darvin & Norton, 2015). Accordingly, scholars concerned with social power, inequality, and critical pedagogical perspectives have often drawn on investment as a conceptual lens to explore how learners engage with educational opportunities (Rahaman, 2025; Tajeddin et al., 2023; Zhang & Huang, 2026). Nevertheless, there still remains a dearth of research "examining multiple cases from different backgrounds using various qualitative approaches to explore the commitment to English learning in connection with the expanded model of investment" (Rahaman, 2025, p. 23).

Darvin and Norton's (2015) expanded model of identity and investment, consisting of the interaction between identity, capital, and ideology (Figure 1), has gained particular relevance in the context of rapid technological changes and the proliferation of multimodal affordances across digital platforms (Darvin & Norton, 2023; Darvin, 2019). Within this framework, social capital, as conceptualized by Darvin and Norton (2015), represents "connections to networks of power" (p. 44), such as access to support, information, peers, teachers, or online communities. More specifically, this capital may take three forms:

institutionalized (e.g., educational), objectified (e.g., valuable items), and embodied (e.g., valued competencies) (Lech & Cohen, 2021).

As argued by Darvin and Norton (2023), high-speed internet allows learners to move seamlessly between online and offline spaces, while engaging with diverse practices and people. Meaningful participation in such environments involves the strategic deployment of semiotic and linguistic resources through which learners express themselves creatively and embody multiple identities (Darvin & Norton, 2023). Such participation requires competencies to negotiate shifting norms, conventions, and expectations across contexts. Within digitally-mediated spaces shaped by intersecting value systems, learners interact with human and non-human actors and experience new forms of social positioning and identity formation (Toohey, 2019).



**Figure 1.** Darvin and Norton's (2015) Model of Investment

One prominent manifestation of this technological shift is the use of Generative Artificial Intelligence (GenAI) tools in EFL writing. AI integration in EFL academic writing presents both opportunities and challenges. Research shows GenAI tools can enhance engagement, lower anxiety, and improve accessibility (Dizon et al., 2025; Kohnke et al., 2023). In particular, ChatGPT was reported to boost writing skills, provide immediate feedback, and support individualized learning experiences (Asadi et al., 2025). However, reliance on AI-generated corrections may bypass deeper linguistic processing, undermine critical thinking, and reduce essential human interaction for language acquisition (Al-Zahrani, 2024; Barrot, 2024; Derakhshan & Ghasvand, 2024). Excessive AI use can also weaken learner-educator connection, decrease motivation and inhibit social development (Al-Zahrani, 2024; Ryan, 2020).

Although a growing body of research has demonstrated GenAI's effectiveness in enhancing linguistic accuracy, text quality, vocabulary, and grammar (Hellmich et al., 2024),

it has largely overlooked learners' perspectives on the broader sociocultural dimensions of AI use, particularly "the nature of capital, its role in investment, and how it can serve as a tool of both social reproduction and transformation" (Darvin & Norton, 2016, p. 28). Moreover, as Darvin (2025) argues, capital "both interacts with and is constrained or amplified by the functionalities of GenAI" (p.10). However, despite the growing integration of AI technologies into EFL writing practices, the connection between learners' capital and their investment in AI-assisted EFL writing has largely remained underexplored.

On the other hand, existing studies on AI and motivation in language learning have mainly relied on quantitative approaches, emphasizing internal psychological constructs while often neglecting broader social dimensions like power and structural inequality (Jafari et al., 2025; Tajik & Karkhaneh, 2025). One notable exception, Soltanian and Ghapanchi (2021), showed that Iranian EFL learners' investment in English was intricately shaped by their access to economic, cultural, social, and symbolic capital. Nevertheless, little attention has been given to how learners perceive AI chatbots as mediators of different forms of capital and, consequently, their investment in academic writing, which may constrain the development of effective pedagogical strategies. This gap is particularly significant because, as Darvin (2025) argues, "developing a critical awareness of how GenAI actively shapes learning and mediates knowledge production requires specific theoretical tools to dissect how power operates in human–AI interactions" (p. 12).

Building on this premise, and with a particular focus on *capital*, the present qualitative study applied Darvin and Norton's (2015) Investment Model to the emerging context of AI-assisted academic writing to examine how Iranian undergraduate non-English majors perceive GenAI as mediating access to diverse forms of capital and, in turn, shaping their investment in English academic writing.

Theoretically, this study extends Darvin and Norton's investment framework by demonstrating how learners' investment in AI-assisted academic writing is dynamically mediated through multiple, interrelated forms of capital, highlighting both the opportunities and constraints introduced by GenAI in language learning. As Darvin (2025) posits, "Cultivating critical digital literacies that recognize how power operates in human-AI interactions is integral to fostering reflexive, inclusive and equitable language learning and teaching in the age of GenAI" (p. 10). Pedagogically, the findings underscore the importance of integrating AI literacy, prompt-crafting skills, and critical evaluation of AI-generated outputs into academic writing instruction to support EFL learners' agency, maintain authorial voice, and promote more equitable participation in AI-assisted writing.

## Review of the Literature

### *Investment Model*

The concept of “investment” emerged during the social turn in Second Language Acquisition (SLA), reflecting the recognition that cognitive theories alone cannot fully explain language learning (Darvin & Norton, 2015). Influenced by post-structuralist perspectives, it foregrounds the roles of social identity and agency in language acquisition (Peirce, 1995; Ellis, 2021; Zuengler & Miller, 2006). Peirce (1995) proposed that identity and power dynamics shape learners’ engagement with language. Unlike traditional motivation theories, which treat motivation as a fixed trait, investment views learners as dynamic individuals whose identities and desires evolve. While motivation is primarily psychological, investment is rooted in sociological perspectives, showing how learners’ lived experiences and social practices influence language learning success (Ushioda, 2020).

Darvin and Norton’s (2015) expanded model of investment integrates the interrelated dimensions of *identity*, *ideology*, and *capital* (Figure 1). From a poststructuralist view, identity is “a site of struggle that is negotiated through language and social interaction” (Darvin & Norton, 2023, p. 31). Peirce (1995) argued that learners’ identities are shaped by multiple desires and social contexts, leading to contradictions and imbalances in language learning (Peirce, 1995; Norton, 2017). More particularly, it has been argued that marginalization based on race, gender, or social class can reduce learners’ investment despite high motivation remaining high (Darvin & Norton, 2023). Consequently, investment should be understood in relation to how identity negotiation intersects with social positioning, inequalities, and power imbalances (Norton & Morgan, 2020). Ideology, another vital element of investment, shapes social practices and power dynamics in language learning by voicing how practices should be undertaken (Anya, 2017; Foucault, 2008). They affect language policies and broader social practices, determining learners’ ability to express themselves and be heard (Darvin & Norton, 2023).

Another central component of investment is capital, which encompasses the various forms of power shaping language learning contexts. Capital is unevenly distributed across social settings, creating both opportunities and limitations for learners. For instance, while some may lack economic resources to access educational facilities, they can draw on linguistic and semiotic resources to engage in digital spaces and expand their social networks (Darvin & Norton, 2016). By navigating these resources, learners invest in language learning not only for instrumental gains but also to pursue identity and community aspirations.

Following Bourdieu's (1990) concept of capital, investment recognizes that cultural, social, and economic resources collectively determine learners' positions within their social world.

Among these sources of capital, social capital plays a central role in shaping learners' legitimacy, access to networks, and opportunities for participation in valued language and literacy practices (Darvin, 2025). As learners interact with others, they are subjected to patterns of control such as schooling systems, institutional norms, and numerous modes of social gatekeeping. Consequently, "they negotiate their material, linguistic, semiotic, cultural, or social resources, which become capital when they are valued by powerful others" (Darvin, 2025, p.14). As Lech and Cohen (2021) suggest, social capital "denotes connections to networks of power, simply speaking, one's social network" (p. 236). It can exist in three different states: *institutionalized*, referring to formally recognized affiliations and credentials that confer authority and legitimacy within a field; *objectified*, referring to material and technological resources embedded in social networks that can be mobilized for participation; and an *embodied* state, referring to internalized dispositions, competencies, and socially valued ways of being that influence how learners are positioned and recognized within academic contexts (Bourdieu, 1986; Darvin & Norton, 2015).

Research in various EFL contexts has increasingly applied the expanded Investment Model to examine English learning practices within diverse social and cultural contexts. In Afghanistan and South Korea, for example, neoliberal ideologies have been shown to increase the value of English, motivating learners to gain economic and social capital (Rabbidge & Zaheeb, 2023). In Iran, learners' beliefs about the utility of English and the supportive role of non-state language institutes have been found to foster investment in language learning (Tajeddin et al., 2023). Soltanian and Ghapanchi (2021) further showed that Iranian learners' investment is driven by potential economic, social, cultural, and symbolic capital. Regarding investment in academic writing, Jiang et al. (2020) explored the learning investment of ethnic minority EFL learners through digital multimodal composing (DMC), a literacy practice that engages learners while using digital tools to construct texts.

### ***AI Employment in Academic Writing***

Artificial Intelligence (AI) refers to machine-based systems capable of simulating human cognitive processes such as learning, reasoning, and problem-solving (Mehrotra, 2019). In recent years, AI has increasingly influenced educational contexts, particularly language learning, by enabling more customized and adaptive learning experiences (Sekeroglu et al.,

2019). However, among its various applications, the use of AI in academic writing has attracted especially significant scholarly attention.

The emergence of AI-powered writing tools, including Intelligent Tutoring Systems and platforms, such as Duolingo and Grammarly (Dewi et al., 2022; Marouf et al., 2024), has reshaped how learners approach academic writing tasks. More recently, GenAI tools such as ChatGPT have intensified this transformation by providing real-time feedback, idea generation, and text production support. While these tools demonstrate considerable pedagogical potential, their integration into academic writing remains contested. Scholars acknowledge that AI can enhance efficiency and provide individualized scaffolding; however, concerns persist regarding overreliance, diminished critical thinking, and reduced learner autonomy (Al-Zahrani, 2024; Hashem et al., 2024).

Beyond pedagogical effectiveness, ethical and epistemological concerns have further complicated AI integration in academic writing. Selwyn (2019) argues that technological innovation in education must be critically examined rather than uncritically adopted. Similarly, Noble (2018) highlights the issue of algorithmic bias, warning that AI systems may reproduce structural inequalities.

Empirical research also reflects these concerns. Mohamed (2024) reports teachers' apprehensions about academic integrity, bias reinforcement, and weakened research skills. Mohammadkarimi (2023) discusses academic dishonesty among EFL learners using AI-assisted writing, emphasizing the need for ethical awareness. Although recent studies recognize both the affordances and limitations of AI tools such as ChatGPT (Wang & Fan, 2025), research has largely focused on ethical, technical, and performance-related dimensions. Considerably less attention has been paid to learners' investment in AI-mediated academic writing, leaving an important conceptual and empirical gap.

### ***Effect of AI Use on Learners' Motivation***

Ideally, AI technologies are expected to enhance learner motivation by offering interactive, adaptive, and engaging learning experiences. Features such as instant feedback, simulations, and gamified elements may increase engagement and foster deeper learning. Several empirical studies report positive outcomes. Ma'amor (2024) found that AI use positively influences student motivation. Yuan and Liu (2025) further demonstrated that AI tools capture the attention of Chinese EFL learners and increase classroom participation.

Nevertheless, the relationship between AI use and motivation is not uniformly positive. Scholars emphasize a gap between the idealized promises of AI and its actual classroom

effects (Nzoka, 2024). Some findings indicate potential risks, including dependency, reduced autonomy, and superficial engagement. Barzanji (2024) reports that although learners perceive ChatGPT as useful for writing and motivating, teachers remain concerned that it may undermine autonomy and creativity, ultimately affecting performance. Yan (2023) similarly identified risks related to diminished intrinsic motivation. These mixed findings suggest that AI's motivational impact is complex and context-dependent, warranting further investigation.

These studies tend to attribute learner commitment solely to individual psychological factors, overlooking the role of social contexts, structural inequalities, and unequal resource distribution (Rahaman, 2025). To address this gap, the present study adopted a poststructuralist perspective, an approach that remains underexplored in research on AI-assisted academic writing. Drawing on Darvin and Norton's (2015) Investment Model, with particular emphasis on the construct of capital, the study explored how AI-assisted writing practices shape Iranian undergraduate non-English major EFL learners' investment in English academic writing by mediating their access to diverse forms of capital. In doing so, the study attends to both the empowering affordances of GenAI and the constraints that may limit learners' opportunities for investment. The following research question guided the research:

How do Iranian undergraduate EFL learners perceive the role of GenAI tools in mediating access to different forms of capital and shaping their investment in English academic writing?

## Methodology

### *Design*

This study adopted a descriptive qualitative approach to explore EFL learners' perceptions of how AI-assisted writing tools may shape their language learning investment, with particular attention to the role of capital in shaping investment. As explained by Tisdell et al. (2025), qualitative researchers conducting a descriptive study seek to describe: "(1) how people interpret their experiences, (2) how they construct their worlds, and (3) what meaning they attribute to their experiences. The overall purpose is to *understand* and *describe* how people make sense of their lives and their experiences" (p. 29). Given the exploratory nature of the study and its focus on learners' perceptions, a descriptive qualitative design was deemed appropriate for generating rich insights into participants' experiences and perspectives (Creswell & Poth, 2025; Tisdell et al., 2025).

### *Context and Participants*

The study was conducted with participants recruited from three large state universities in Tehran, Iran. In the Iranian context, English is learned as a foreign language and is acquired primarily through formal instruction at the secondary and tertiary levels. English language education has traditionally been characterized by a grammar-oriented instructional approach in public schools, with a strong emphasis on reading and grammatical accuracy, an approach which has been criticized for providing limited opportunities to develop productive skills such as academic writing. As a result, many learners supplement their education through private language institutes, creating disparities in access to high-quality English instruction. At the university level, English plays a fairly critical role in students' academic development, particularly because many disciplinary textbooks, scholarly resources, and research publications are available primarily in English.

Technology integration in Iranian EFL education presents a complex sociotechnical landscape. Although both instructors and learners acknowledge the potential of digital technologies to facilitate language learning, their implementation is often constrained by limited teacher training, insufficient curricular integration, uneven technological infrastructure, internet filtering, sanctions-related connectivity limitations, and varying levels of digital literacy. These contextual factors both enable and constrain learners' opportunities to engage with AI-mediated writing support, making the Iranian university contexts particularly relevant for examining how learners negotiate their investment in academic writing within broader institutional, technological, and sociocultural conditions (Mirsanjari, 2025; Zohrabi & Madineh, 2026).

To address the study's objective—exploring how Iranian undergraduate EFL learners perceive the role of GenAI tools in mediating access to different forms of capital and shaping their investment in English academic writing—qualitative data were collected from a convenience sample of 75 male and female undergraduate non-English-major students (aged approximately 18–22) enrolled at three accredited state universities in Tehran, Iran. The universities were selected for several reasons. First, they are among accredited state universities in Tehran that admit students through Iran's competitive national university entrance examination (Konkour). This ensured that the participants represented academically qualified undergraduate students. Second, these universities offer General English courses to a large population of non-English-major students. Finally, the researchers' roles as university instructors at these institutions facilitated access to the research sites, as well as participant recruitment, data collection, and engagement throughout the study.

Data were generated through online written interviews completed by 65 participants and semi-structured oral interviews conducted with 10 participants. The latter group also maintained learner diaries throughout the study to provide reflections on their experiences. Purposive sampling was employed to ensure that all participants met the predetermined inclusion criteria. Specifically, participants were first- or second-year undergraduate non-English-major students at Iranian state universities in Tehran and reported having a moderate level of familiarity with AI technologies. They represented a diverse range of academic disciplines, including Cellular and Molecular Biology, Social Work, Biology, Mechanical Engineering, and Educational Sciences, enabling the study to capture perspectives from students with varied disciplinary backgrounds.

According to their self-reports, all participants had used GenAI tools, particularly ChatGPT, to support their English academic writing assignments for at least three months prior to participating in the study. Their self-reported English language proficiency ranged from pre-intermediate to upper-intermediate levels. Although all participants had received approximately three to five years of formal English instruction through public schools and private language institutes, none had previously completed a formal course in academic writing. Consequently, they represented an information-rich population of undergraduate students for whom GenAI tools served as an educational resource to compensate for their limited formal instruction in academic writing.

Participation in the study was entirely voluntary, and informed consent was obtained from all participants before data collection commenced. Participants were assured that their responses would remain confidential and anonymous and that their participation, or the content of their responses, would have no effect on their academic standing.

### ***Data Collection and Procedure***

Two qualitative data sources were employed in this study: interviews (written and oral forms) and reflective diary reports. The use of multiple data sources enabled triangulation and enhanced the credibility of the findings by capturing both retrospective reflections and ongoing experiences (Creswell & Poth, 2025; Tisdell et al., 2025). The data sources and procedure for conducting the research are explained below:

### ***Interviews***

Individual interviews were conducted to explore the participants' experiences with AI-assisted academic writing in relation to their investment and access to diverse forms of

capital. The interview protocol was developed based on [Darvin and Norton's \(2015\)](#) Investment Model, with particular attention to the dimensions of *capital*. Major thematic areas included: participants' patterns of AI use in academic writing tasks; perceived changes in engagement and investment in writing; perceived influence of AI use on interactions with peers and instructors; access to technological and institutional resources; and perceived challenges such as unequal access, legitimacy concerns, and ethical issues related to AI use (Appendix A).

The interview guide was reviewed by an expert in Applied Linguistics to establish content validity and was pilot-tested with a couple of EFL learners to ensure clarity and appropriateness of the questions. Based on the pilot interview, minor revisions were made to improve the wording and clarity of interview questions. To elicit the participants' perceptions and experiences, the designed open-ended interview questions were administered online to a large pool of first- and second-year non-English-major undergraduate students enrolled at three accredited state universities in Tehran, Iran. The online written interview allowed participants to respond at their convenience and in their own words ([Creswell & Poth, 2025](#); [Tisdell et al., 2025](#)). A total of 65 students completed the written interview. An additional 10 participants took part in semi-structured oral interviews by recording and submitting their voice responses through a social media messaging platform. This asynchronous mode of data collection provided participants with the flexibility to reflect on and articulate their experiences in greater length and depth.

Participants were invited to respond in either English or Persian to ensure that language proficiency did not constrain their expression of experiences. During the semi-structured oral interviews, follow-up questions were used to clarify vague or incomplete responses. The total duration of the recorded responses for each interview was approximately 30–45 minutes. All written interview responses were saved as text files. Responses provided in Persian were translated into English by one of the researchers. The oral interviews were transcribed verbatim, and together with the written responses, compiled into textual datasets for analysis.

### ***Reflective Diary Reports***

In addition to interviews, reflective diary reports were collected to capture the participants' ongoing experiences with AI-assisted academic writing over time. Diary reports were selected as a data source because they allow participants to document their perceptions, challenges, and learning processes in naturalistic contexts, providing insights that may not emerge in one-time interviews ([Bolger et al., 2003](#); [Creswell & Poth, 2025](#)). The diary

reports, prepared by the same 10 students who participated in the oral interviews, complemented the interview data by documenting the learners' experiences more longitudinally and enabling the researchers to compare reported practices with interview data.

Participants were requested to submit weekly diary entries for four consecutive weeks (a total of approximately four entries per participant). Each entry was expected to be approximately 150–250 words in length. The diaries were submitted via a social media messaging platform in either English or Persian. To facilitate consistent and focused reflections, participants were provided with guiding prompts to structure their reflections. These prompts were designed to elicit reflections on their experiences of using GenAI tools for academic writing, with particular attention to issues related to investment and social capital (Appendix B).

All written interview responses, verbatim transcripts of the oral interviews, and diary entries were compiled into a single textual corpus for analysis. Data originally produced in Persian were translated into English by the researchers prior to coding and analysis.

### ***Data Analysis***

Data collection and preliminary analysis occurred concurrently. As interviews and diary reports were collected, the researchers constantly compared emerging patterns across participants and data sources. By the later stages of analysis, newly collected data largely reinforced the existing thematic patterns concerning AI-assisted writing, social capital, embodied resources, emotional experiences, and institutional influences, with few significantly new insights emerging, demonstrating sufficient thematic saturation for the exploratory purposes of the study.

Data were analyzed using [Braun and Clarke's \(2006, 2021\)](#) Reflexive Thematic Analysis (RTA). Following familiarization with the dataset through repeated reading of the written interviews, oral interview transcripts, and diary reports, initial codes were generated inductively across the entire dataset. Codes capturing conceptually related ideas were then assembled into initial themes and sub-themes, which were iteratively reviewed, refined, and reorganized through recursive engagement with the data and the relevant literature. The final themes were defined and named in relation to [Darvin and Norton's \(2015\)](#) Investment Model, ensuring coherence between the empirical findings and the study's theoretical framework. A sample of the final codebook and a sample of data analysis are provided in Appendices C and D to enhance the transparency of the analytic process.

Throughout the analysis, reflexivity was maintained through regular discussions among the researchers regarding coding decisions, category boundaries, and alternative interpretations. Accordingly, rather than calculating intercoder reliability coefficients, the researchers adopted a consensus agreement approach during which they discussed discrepancies and negotiated shared interpretations. Furthermore, consistent with [Braun and Clarke's \(2006, 2021\)](#) RTA approach, coding was treated as an interpretive, recursive, and reflexive process in which codes assigned to data segments were continually refined, merged, split, or discarded throughout analysis. Accordingly, as code generation in RTA is dynamic rather than fixed, the total number of generated codes is not reported, as code counts are not considered analytically meaningful within this approach ([Braun & Clarke, 2021](#)).

### ***Trustworthiness and Ethical Considerations***

To enrich the trustworthiness of the study, several strategies were employed. Methodological triangulation was achieved by incorporating data from written interviews, semi-structured oral interviews, and reflective diary reports. This could enable the researchers to examine emerging patterns across multiple sources of evidence. Credibility was further strengthened through prolonged engagement with the dataset, involving iterative cycles of coding, category generation, refinement, and consensus-based interpretation in accordance with [Braun and Clarke's \(2006\)](#) RTA. Furthermore, transferability was enhanced by providing a rich description of the research context, participants, data collection methods, and analytic process, enabling readers to determine the applicability of the findings to other contexts.

Ethical considerations were also observed throughout the research process. Participants were informed about the purpose of the study and provided written informed consent prior to data collection. Participation was completely voluntary, and participants were informed that they could withdraw from the study at any stage they wanted. All data were anonymized, securely stored, and used exclusively for the research purpose ([Creswell & Poth, 2025](#)).

### **Findings**

This study explored how Iranian undergraduate EFL learners perceived the role of GenAI tools in mediating access to different forms of capital and shaping their investment in English academic writing. A careful analysis of the interview data and learner diaries revealed that the use of GenAI in academic writing mediated multiple forms of interrelated capital, including pedagogic-material, psychological, embodied, institutionalized, and digital-economic capital. These forms of capital both facilitated and constrained the learners'

investment in English academic writing in different ways. The major themes that emerged from the analysis are discussed below:

### ***AI as Source of Pedagogic-Material Capital***

The meticulous analysis of the data illustrated that, for the majority of participants, GenAI tools functioned as a pedagogical resource that provided instructional support for academic writing. The learners perceived AI chatbots as valuable tools that facilitated their engagement in academic writing practices by offering immediate, personalized linguistic and instructional assistance. They identified a wide range of benefits, including instant grammar correction, paraphrasing, rewriting, outlining suggestions, paragraph organization, idea generation, brainstorming, and other forms of scaffolded writing support. Many participants described AI as “a mobile instructor” that enhanced the accuracy, fluency, coherence, and precision of their academic writing.

*ChatGPT helps me with brainstorming, it helps me organize my thoughts... It cleans up my grammar messes and makes my writing look way smarter. (Oral interview)*

*I primarily use AI tools when writing university assignments and formal emails in English. For example, I rely on them to correct grammatical errors, improve sentence structure, suggest appropriate academic vocabulary, and revise sections of my writing that lack clarity or fluency. (Written interview)*

Similarly, a number of participants reported that sustained engagement with AI tools had expanded their academic vocabulary, enriched their repertoire of grammatical structures, and enhanced their ability to express complex ideas more effectively in writing.

*AI has helped expand my vocabulary in English, which aids my writing skills.... I can better put my ideas into words to communicate more effectively with readers. (Oral interview)*

*For example, I enter a word and ask the AI to provide its meaning, grammatical category, and common collocations. It presents the information in a clear and organized manner, which I then use as a basis for practice. (Written interview)*

Besides viewing GenAI as a pedagogical resource, the analysis of the data suggested that a number of participants also perceived AI-generated writing artifacts as a form of material capital. They highlighted the value of AI-generated templates, drafts, outlines, and other writing models, which functioned as tangible and reusable resources that could be stored, shared, adapted, and refined for future writing tasks, thereby expanding their repertoire of writing resources and facilitating subsequent writing activities.

*AI gives me ready-made structures for essays, like introductions and conclusions, so I know how academic writing should look. (Oral interview)*

*I keep the AI-generated introductions in a folder and use them as models for my next assignments. (Diary entry)*

Nevertheless, despite recognizing GenAI tools as a valuable pedagogic, linguistic, and material resource that supported their academic writing and enhanced their linguistic competence, the accounts shared by a number of participants demonstrated a critical awareness of their limitations. They highlighted challenges such as the occasional generation of inaccurate or misleading information, grammatical and linguistic errors, misinterpretation of user intentions, and unnatural writing. They emphasized that AI-generated outputs should be subjected to careful monitoring and revision before being incorporated into academic writing.

*Once, I asked the AI whether the sentence structure it had generated was correct. It apologized, acknowledged that it was incorrect, and then provided a corrected version. (Written interview)*

*Sometimes the AI does not correctly understand the precise meaning of a scientific term and provides general or imprecise equivalents, which can alter the intended meaning. (Written interview)*

### ***AI as Source of Psychological Capital***

Besides viewing AI tools as pedagogical resources, participants also highlighted their roles as sources of psychological capital in supporting their academic writing practices. Several learners described AI as a convenient and non-judgmental source of support that increased their writing confidence and reduced their writing anxiety. This psychological support made them feel more capable of engaging in academic writing practices, including communicating

with classmates and instructors through emails written in English. Participants attributed this increased confidence and sense of legitimacy in academic communication to AI's provision of access to the academic language and discourse practices valued within university contexts. They explained that acquiring these linguistic resources enabled them to express their ideas and arguments more confidently and to participate more actively in academic interactions.

*When I wrote with AI support, I felt calmer because I was not afraid of making too many grammar mistakes. It feels like someone is guiding me step by step while I write. (Diary entry)*

*Using AI helps me express my ideas more academically, so I feel more confident when I communicate with my classmates or email my instructors. (Oral interview)*

*Before AI, I was afraid of writing because I didn't know the right words. Now I feel I have the right language to participate. (Diary entry)*

Despite such positive feelings, a few of the participants voiced apprehension about becoming overly reliant on AI tools for academic writing. They stated that dependence on GenAI could reduce critical thinking, encourage cognitive passivity and mental laziness, and limit independent engagement with the writing process. They pointed to the potential drawbacks of excessive reliance on AI, noting that it could hinder the development of their independent writing abilities by reducing opportunities for writing practice. In addition to fearing dependency on AI, a subset of participants was concerned that overreliance on AI-generated content could diminish their authorial voice, resulting in mechanical and impersonal texts that no longer reflected their own perspectives, identity, creativity, or self-expression.

*I am concerned that if I rely on it too much, I may stop thinking independently, and my writing may become mechanical and lack originality. (Written interview)*

*If I don't feel like doing an assignment, I sometimes use AI to complete it. There have even been times when I submitted the assignment without much revising or adding anything to it. In that sense, using AI has made me somewhat lazy! (Oral interview)*

*I feel that we are merely completing assignments rather than genuinely learning. (Diary entry)*

A couple of participants also expressed concerns that AI-mediated writing created a sense of disconnection from their “authentic selves.”

*Using AI has sometimes created a sense of distance in me. At times, I feel there is a gap between my own intellectual ability and the final output of my work. As a result, when interacting with my instructors, I sometimes feel uncertain about whether they are recognizing my genuine abilities or merely the output produced with the help of AI tools (Written interview).*

### ***Embodied Capital in Using AI***

The analysis of the learners' responses further indicated that the participants recognized the pivotal role of embodied capital—conceptualized as knowledge, skills, and dispositions that learners need to possess—in shaping their investment in using GenAI for academic writing. In particular, they identified English language proficiency as a key competency that influenced their ability to craft effective prompts in English, comprehend AI-generated responses and feedback, and critically evaluate the relevance and appropriateness of AI-generated suggestions. Conversely, limited English proficiency was perceived as constraining these capabilities, thereby reducing their investment in engaging with GenAI for academic writing.

*I suppose there is a direct relationship between a person's level of English language knowledge and how closely they engage with AI. That's because stronger language proficiency can help formulate clearer prompts and better understand AI-generated explanations. (Oral interview)*

*When I wrote clearer prompts in English, AI gave me better explanations. If my English is weak, the answers are confusing. (Diary entry)*

In addition to English language proficiency, the participants identified prompt-crafting skills as another essential embodied competence that shaped their investment in using GenAI for academic writing. They perceived the ability to formulate clear, precise, and contextually appropriate prompts as instrumental in determining the quality and relevance of AI-generated outputs.

*Due to lack of prompt writing skills... there were times when I used the text or idea received from ChatGPT with very little or no modification. So, I couldn't be very deeply engaged with the language. (Diary entry)*

*Sometimes I struggle with prompt writing and may not fully communicate my intended meaning to the AI. (Written interview)*

Furthermore, the participants, as non-English major students, reported that their disciplinary knowledge constituted another embodied competence that enhanced their investment in using GenAI for academic writing. They explained that subject-specific knowledge enabled them to formulate discipline-specific prompts, and to evaluate the quality, accuracy, and relevance of AI-generated explanations and outputs.

*Because of my major, I know which words I should apply when I'm using AI so I can get more relevant results. (Written interview)*

*My knowledge, in my own major, helps me guide ChatGPT better, and I understand the content of ChatGPT very well. (Oral interview)*

The participants also identified AI literacy, particularly the ability to critically evaluate and use AI-generated outputs, as another essential embodied competence that shaped their investment in using GenAI for academic writing. They perceived AI literacy as enabling them to engage with GenAI strategically, assess the accuracy, credibility, and relevance of AI-generated content, and make informed decisions about how to incorporate AI assistance into their writing. In contrast, they believed that a lack of AI literacy could lead users to rely excessively on AI-generated outputs, foster passive engagement and reduce opportunities for independent thinking and learning.

*I use it more like a tool to polish my own ideas, and I pay attention to the details of that information that AI told me and share that with my writing instructor to see if they are really correct or not. (Written interview)*

*I don't blame AI. It depends on the recipient. They can just copy, or actually learn from it. (Oral interview)*

*... I just accepted what ChatGPT gave me. Later, I felt I didn't really learn the language points deeply, only finished the assignment faster. (Diary entry)*

### *AI as Source of Social Capital*

The participants' accounts also indicated that GenAI tools acted as social mediators, shaping and reshaping their connections with peers and instructors while reconfiguring patterns of interaction within their academic networks. On the one hand, the learners described drawing on these social networks to exchange prompts, recommend AI tools, share effective writing strategies, and negotiate appropriate ways of using AI for academic writing. Accordingly, a subset of participants reported engaging with GenAI collaboratively rather than individually. They described writing together, comparing AI-generated responses, discussing alternative suggestions, and jointly evaluating and selecting the most appropriate outputs. They perceived that such conversations, collaboration, and the exchange of AI-related knowledge and expertise fostered their social relationships with individuals in their academic communities.

*We used AI tools together to write in English, and it is really enjoyable. (Diary entry)*

*We sat together and compared what AI suggested for our essays. We talked about different answers and chose the best one. (Written interview)*

*Using AI in group work makes us communicate more because we need to decide together how to use the output. (Oral interview)*

*We share our prompts with each other to see who gets better answers, and then we help each other choose the best one. (Oral interview)*

Nevertheless, the analysis also revealed another side of this phenomenon. Although a number of participants perceived that GenAI could function as a source of social capital by enhancing their confidence, facilitating collaboration, and enabling more active engagement with classmates and instructors, many also believed that reliance on AI-mediated support for academic writing could reduce their engagement in interpersonal interactions and human consultation. They reported interacting less frequently with classmates, seeking less peer support, experiencing fewer face-to-face exchanges, and, in some cases, feeling detached from their learning community.

*Instead of talking to a living person, I am communicating with something that doesn't exist. (Diary entry)*

*When I use AI, I don't feel the need to ask my classmates anymore, even when we are in the same classroom. (Oral interview)*

*Today I used AI instead of asking my classmates about my writing. I finished my task, but I felt a little lonely because I didn't talk to anyone in class. (Diary entry)*

### ***Institutionalized Capital in Using AI***

The analysis of the data identified institutionalized capital as another form of capital shaping learners' investment in AI-assisted writing. A few participants perceived GenAI as providing access to institutionally valued academic genres, disciplinary discourse conventions, and academic writing norms, thereby enabling them to align their writing with university expectations.

*It shows me how to write in the style of academic essays, which I didn't learn before. (Written interview)*

However, the participants' accounts were dominated by concerns about insufficient institutional policies and support, which they believed diminished their investment in AI-assisted writing. The majority of participants reported minimal institutional support and training making them rely more on self-directed AI learning, chiefly through informal communities.

*My university hasn't provided any official training about using AI. (Oral interview)*

*Up to this point, I have not received any official training or support from the university regarding AI. My use of these tools has been entirely based on self-learning and trial and error. (Written interview)*

In addition, the participants reported that due to inconsistencies and ambiguities in institutional policies regarding the use of GenAI for academic writing, they were often uncertain whether their AI-assisted writing would be recognized as a legitimate academic practice or be subject to criticism or sanctions. This uncertainty also extended to issues of academic integrity, with many learners expressing concerns about plagiarism and questioning whether using AI-generated suggestions might be perceived as cheating.

*Unclear institutional policies make us uncertain about being accused of academic dishonesty. (Diary entry)*

*At times, I don't know whether it's cheating if I use suggestions but rewrite everything myself. (Diary entry)*

*Policies around AI use make me a bit cautious... I sometimes avoid talking about AI because I'm not sure what's allowed, and I'm scared others might think that I'm cheating. (Written interview)*

More specifically, the triangulated data revealed that these institutional inconsistencies were also reflected in their instructors' contrasting attitudes toward AI use. While some participants reported that their instructors discouraged the use of AI in academic writing, others indicated that they supported its appropriate use, provided that it was employed responsibly and did not replace their own independent work.

*I don't know if my instructor will accept writing that I improved with AI. There is no clear rule, and this made me nervous when I submitted my assignments. (Diary entry)*

*I am really motivated to use AI chatbots to get help in academic writing, but it seems like our instructors don't really approve of it. (Oral interview)*

*Our instructors always emphasize that although we use AI, what matters is using it correctly and making sure that it does not replace us as human beings or take away our independence. (Oral interview)*

### ***AI as Source of Digital-Economic Capital***

Although the majority of participants believed that using GenAI tools facilitated academic writing, enhanced efficiency, and saved time, they also recognized that unequal access to technological and economic capital created significant disparities in their AI-assisted writing practices. They emphasized that resources such as high-speed and reliable internet connections, premium AI subscriptions, and access to advanced AI devices enabled some learners to engage more effectively with GenAI tools and to produce more sophisticated outputs. In contrast, those learners with limited internet access or those relying on free versions with restricted functionalities experienced fewer opportunities to benefit from these technologies.

*With the free version, I only get short answers, but my friend's premium AI gives full essays and structured outlines. (Diary entry)*

*Learners who have access to high-quality AI tools for academic writing have a head start. (Written interview)*

Moreover, the learners emphasized that critical national conditions, particularly during the recent Israel–Iran wars—when internet disruptions, electricity outages, filtering, and restricted international internet access occurred—constrained their ability to access and utilize AI tools. From the perspective of investment, such circumstances created unequal patterns of technological accessibility, “*privileging individuals who possessed internet connections,*” had “*financial resources to secure connectivity,*” or “*the means to circumvent such limitations,*” while marginalizing those who lacked these socio-economic resources. Several learners also described concrete infrastructural limits that restricted reliable access to AI.

*During the war, access to AI was not possible because of internet and electricity outages. Without these tools, organizing my ideas became much more difficult. (Written interview)*

*Due to the inaccessibility to AI during the war, the process of writing and editing became more difficult and time-intensive. (Oral interview)*

*During the internet shutdown and the war, access was very limited, and this had a negative effect on my writing and learning. (Written interview)*

However, the data revealed that the participants responded to these digital-economic disparities in different ways. Some participants described unequal access as a form of injustice and inequality in educational opportunities, expressing negative emotional responses such as frustration, disappointment, and concerns about falling behind their peers.

*In Iran, access to premium ChatGPT subscriptions is restricted, and we must use a VPN. It's really disappointing. (Oral interview)*

*In my opinion, AI can cause inequality because students who can afford premium versions are able to produce higher-quality work than others. Other students, including myself, may feel that we are competing in an unequal race, constantly worrying about falling behind or losing our own fundamental skills. (Diary entry)*

In contrast, a few participants reported that these circumstances strengthened their competitive motivation and resilience, encouraging them to seek alternative solutions, such as making the most of freely available or domestic GenAI tools, relying on their own abilities, and practicing to use AI less.

*There are many free AI tools available. Nothing can stop someone who is genuinely motivated to pursue knowledge. (Diary entry)*

*Iranian AI tools and domestic platforms performed relatively well and met our needs during the war. (Oral interview)*

*During the war, access to AI was completely cut off, and at times I had to do the work myself, and although it took longer, it improved some of my skills. (Oral interview)*

*At first, it was difficult because I had no access during the war, but later I didn't mind it, and even after access was restored, I tried to use AI much less, only for generating ideas. (Written interview)*

## Discussion

This study explored how non-English-major undergraduate EFL learners perceived the role of GenAI tools in mediating different forms of capital and shaping their investment in English academic writing. Drawing on [Darvin and Norton's \(2015, 2023\)](#) Investment Model, the findings demonstrated that the learners' investment in AI-assisted academic writing was simultaneously enabled and constrained through multiple, interconnected forms of capital, including pedagogic-material, psychological, embodied, social, institutionalized, and digital-economic capital. Rather than functioning merely as technological tools, GenAI applications mediated the learners' access to valued linguistic, psychological, social, institutional, and technological resources while simultaneously introducing new challenges related to dependency, legitimacy, inequality, and identity. These findings extend current understandings of AI-assisted language learning by illustrating how the learners continuously negotiated agency, access to resources, and participation within AI-mediated academic writing environments.

The findings first demonstrated that GenAI functioned as a source of pedagogic-material capital by providing both instructional support and reusable writing resources that facilitated the learners' engagement in English academic writing. Participants perceived AI as an accessible pedagogical companion that provided immediate grammatical feedback,

vocabulary support, paraphrasing, brainstorming, outlining, and organizational guidance while generating reusable resources such as templates, drafts, and genre-specific models. These findings are consistent with previous studies showing that AI-assisted writing tools reduce linguistic barriers, facilitate idea generation, provide individualized feedback, foster learner autonomy, and support writing development (Dizon et al., 2025; Mohammed & Khalid, 2025; Song & Song, 2023; Yan, 2023). From an investment perspective, these pedagogical and material resources expanded the learners' access to valued academic writing practices, increasing opportunities to participate more confidently in English academic writing and convert linguistic and technological resources into symbolic capital through greater confidence and perceived legitimacy (Darvin & Norton, 2016).

Unlike many previous studies that have primarily emphasized AI as a source of linguistic assistance, the present findings further suggest that the learners perceived AI-generated outputs themselves as valuable material resources that could be accumulated, adapted, and strategically reused across future writing tasks. This finding extends Darvin and Norton's (2015, 2023) conceptualization of capital by illustrating how AI-generated artefacts can function as tangible resources that may expand learners' repertoire of academic writing practices and facilitate continued participation in disciplinary communities.

At the same time, participants demonstrated considerable critical awareness of AI-generated outputs. Rather than accepting AI responses uncritically, many recognized inaccuracies, misleading explanations, grammatical inconsistencies, and disciplinary misunderstandings, emphasizing that AI-generated texts required careful monitoring and revision before being incorporated into academic writing. This finding supports recent arguments that successful AI-assisted writing depends not only on access to technological tools but also on learners' ability to critically evaluate and regulate AI-generated content (Darvin, 2025; Soltanian & Ghapanchi, 2021; Sun, 2024).

Beyond its pedagogical affordances, the findings further demonstrated that GenAI served as a source of psychological capital that shaped the learners' investment in academic writing. Participants consistently described AI as a supportive and non-judgmental writing companion that reduced writing anxiety, increased confidence, and encouraged greater participation in English academic communication. Similar findings have been reported in previous research suggesting that AI-mediated feedback lowers affective barriers, enhances learners' confidence, and promotes greater willingness to engage in second-language writing tasks (Derakhshan & Ghiasvand, 2024; Song & Song, 2023). From an investment perspective, these psychological scaffoldings strengthened the learners' perceived legitimacy

within academic communities by enabling them to communicate through the linguistic conventions and discourse practices valued in higher education (Darvin, 2025). Consequently, confidence became not merely an emotional outcome but also an important condition that encouraged the learners to participate more actively in academic writing and communication.

However, the findings also reveal that psychological capital may simultaneously constrain learners' investment when AI use becomes excessive. Several participants expressed concerns that overreliance on GenAI reduced opportunities for independent thinking, encouraged cognitive passivity, and limited meaningful engagement with the writing process. Others reported that dependence on AI-generated texts weakened their sense of authorship, creating concerns that their writing no longer reflected their own ideas, creativity, or intellectual identity. Particularly noteworthy was participants' description of feeling disconnected from their "authentic selves" when submitting AI-assisted assignments, as they became uncertain whether outside readers were recognizing their own abilities or the performance of AI. These findings extend previous research by demonstrating that AI-assisted writing may influence not only learners' confidence but also their perceptions of identity, ownership, and authenticity (Darvin & Norton, 2015, 2023). Consistent with Darvin's (2025) argument that investing in agentic GenAI practices requires learners to negotiate how power operates within human–AI interactions, psychological investment appears to involve balancing the benefits of immediate support against the risks of dependency, diminished authorial voice, and reduced opportunities for independent learning. This suggests that although GenAI can strengthen learners' confidence and willingness to participate, excessive reliance may also reshape their sense of agency and identity as writers, highlighting the psychological tensions inherent in AI-mediated academic writing (Chen et al., 2025; Selwyn, 2019; Sun, 2024).

The findings further highlighted the central role of embodied capital in shaping the learners' investment in AI-assisted academic writing. Consistent with Darvin and Norton's (2015, 2023) conceptualization of capital as socially situated resources, participants emphasized that the effectiveness of AI support depended not only on access to technology but also on the knowledge, skills, and dispositions they brought to the interaction. English language proficiency emerged as a fundamental competence that enabled the learners to formulate clearer prompts, comprehend AI-generated explanations, and critically evaluate the relevance and accuracy of AI outputs. Conversely, limited language proficiency constrained these capabilities, reducing both the quality of AI-generated responses and the learners'

engagement with AI-assisted writing, as reported by them. These findings corroborate previous research suggesting that AI does not eliminate the importance of language proficiency but rather amplifies the value of learners' existing linguistic competence in mediating productive human–AI interaction (Ou et al., 2024; Qu et al., 2024; Zhao et al., 2024).

Participants also identified prompt-crafting skills as another important component of embodied capital. Those learners who were able to formulate precise, contextually appropriate prompts generally reported receiving more relevant and useful AI responses. In contrast, those with limited prompt-writing skills often relied on AI-generated outputs with little modification. This finding suggests that prompt engineering has become an important literacy practice in AI-assisted language learning, influencing the extent to which learners actively construct knowledge or passively consume AI-generated content (Al-Zahrani, 2024; Walter, 2024).

Furthermore, participants emphasized that disciplinary knowledge enhanced their ability to formulate specialized prompts and critically evaluate AI-generated explanations within their fields of study. Rather than relying solely on AI-generated responses, the learners frequently drew upon their disciplinary expertise to verify, refine, and contextualize AI-generated information before incorporating it into their writing. Similarly, participants highlighted AI literacy, particularly the ability to critically evaluate the credibility, accuracy, and appropriateness of AI-generated content, as another important form of embodied capital. The learners with stronger reported-AI literacy viewed GenAI as a tool for refining their own ideas, whereas those with weaker evaluative skills were more likely to accept AI-generated outputs without reflection, reducing opportunities for deeper learning. Together, these findings reinforce previous research suggesting that learners' competencies determine whether AI use leads to strategic learning or passive dependency (Darvin, 2018; Soltanian & Ghapanchi, 2021). From an investment perspective, embodied capital mediates how learners transform technological resources into meaningful learning opportunities, illustrating that access to AI alone is insufficient unless accompanied by the linguistic, disciplinary, and evaluative competencies required for critical engagement.

The findings further demonstrate that GenAI reshaped the learners' social capital by simultaneously expanding and constraining opportunities for participation within their academic communities. Participants described AI as facilitating collaborative learning through sharing prompts, comparing AI-generated responses, discussing alternative suggestions, and jointly evaluating writing outputs. These collaborative practices enabled the

learners to exchange AI-related knowledge and negotiate more effective ways of using GenAI, thereby strengthening peer interaction and expanding access to collective learning resources. These findings are consistent with research suggesting that AI-mediated learning can foster collaborative knowledge construction and enhance learners' engagement in academic communities (Szabó & Szőke, 2024). In this respect, AI did not replace social interaction but, for some learners, became a shared resource or “social mediator” around which new forms of collaboration and peer learning emerged.

At the same time, the findings revealed a more complex transformation of the learners' social relationships. Although AI facilitated collaboration in some contexts, many participants also reported interacting less frequently with classmates and seeking less support from instructors because AI provided immediate, accessible, and non-judgmental assistance. This finding resonates with Darvin's (2025) observation that interactions with GenAI are often individualized, producing highly personalized outputs that may reduce opportunities for collective negotiation of meaning and critical dialogue. Likewise, previous research suggests that AI may create psychologically safe learning environments that reduce anxiety while simultaneously weakening interpersonal interaction (Derakhshan & Ghiasvand, 2024).

A particularly noteworthy finding concerns the emotional dimension of this transformation. Several participants reported feeling lonely or emotionally detached despite successfully completing their writing tasks with AI support. Although AI increased confidence and writing efficiency, it also reduced opportunities for face-to-face interaction with peers and instructors, leading some learners to experience a diminished sense of belonging within their academic communities. This emotional dimension of AI-mediated participation has received relatively limited attention in previous AI-assisted writing research and extends current understandings of social capital by illustrating that technological mediation influences not only learners' patterns of participation but also their affective experiences of belonging. Consistent with Norton's (2013, 2016) conception of investment, the learners continuously negotiated the benefits of increased autonomy against the loss of interpersonal interaction. Thus, AI-assisted writing was perceived not merely as a technological support mechanism but also as a factor reshaping the learners' relationships, identities, and emotional experiences of participation in academic writing (Darvin & Norton, 2015, 2023). As several participants' accounts illustrated, AI-mediated access to social capital may involve emotional trade-offs whereby increased confidence and independence coexist with reduced interpersonal engagement and social connectedness (Chen et al., 2025; Selwyn, 2019; Sun, 2024).

The findings further indicated that institutionalized capital played a significant role in shaping the learners' investment in AI-assisted academic writing. On the one hand, participants perceived GenAI as providing access to institutionally valued academic genres, disciplinary discourse conventions, and writing norms, enabling them to align their writing more closely with university expectations. In this sense, AI functioned as a mediating resource through which the learners gained greater access to forms of academic knowledge and writing practices recognized and rewarded within higher education.

On the other hand, participants consistently reported that insufficient institutional support, limited AI-related training, and ambiguous university policies constrained their investment in AI-assisted writing. These findings are consistent with previous research showing that unclear institutional regulations and limited pedagogical guidance create uncertainty regarding the appropriate use of AI in educational settings ([Zawacki-Richter et al., 2019](#); [Darvin & Norton, 2015](#)). In the absence of formal guidance, many learners relied on self-directed learning and informal peer networks, reducing opportunities to develop institutionally supported AI literacy and potentially reinforcing educational inequalities. This finding also aligns with previous calls for clearer institutional policies, stronger AI literacy initiatives, and more comprehensive ethical frameworks for AI integration in higher education ([Estrellado & Miranda, 2023](#)).

Participants further expressed uncertainty about plagiarism, academic integrity, and whether AI-assisted writing would be recognized as legitimate academic work. Ethical ambiguity complicated the learners' investment because many hesitated to acknowledge their AI use for fear of being perceived as cheating, despite evidence that transparent and responsible AI use can mitigate plagiarism concerns ([Karkoulou, 2024](#)). The findings also suggest that instructors play an important mediating role in learners' investment. Rather than simply encouraging or prohibiting AI use, instructors appeared to emphasize responsible integration that preserves learners' autonomy, critical engagement, and academic responsibility. Therefore, pedagogical support should extend beyond regulating AI use to helping learners develop reflective and ethical approaches to AI-assisted writing ([Sun, 2024](#)). From an investment perspective, these findings reinforce [Darvin and Norton's \(2016\)](#) argument that the value of capital depends on institutional recognition and legitimacy.

Finally, the findings highlight the important role of digital-economic capital in shaping learners' investment in AI-assisted academic writing. Although participants widely acknowledged that GenAI improved writing quality, efficiency, and productivity, they also emphasized that unequal access to technological resources created substantial disparities in

learning opportunities. Reliable internet connections, premium AI subscriptions, and access to advanced technological devices enabled some learners to engage more effectively with AI tools, whereas others experienced significant limitations because they relied on free versions or unstable internet access. These findings support previous research demonstrating that unequal distribution of digital resources contributes to educational inequality and shapes learners' opportunities to benefit from emerging technologies (Rahaman, 2025).

Consistent with Darwin's (2025) argument that "as users and tools are positioned in human–AI interactions, the distribution of resources shapes the way these interactions unfold and the way agency is exercised" (p. 14), participants further emphasized that internet disruptions, electricity outages, filtering, and restricted international connectivity during the recent Israel–Iran war substantially limited their ability to access and use AI for academic writing. These socio-political conditions reinforced existing forms of digital inequality by privileging learners who possessed greater technological and financial resources while marginalizing those with fewer opportunities for reliable access. The findings therefore illustrated that the learners' investment in AI-assisted writing is influenced not only by individual motivation and competence but also by broader structural conditions that shape access to technological resources (Darvin, 2025).

A distinctive finding of the present study is that the participants did not respond uniformly to these constraints. Although many perceived disrupted AI access as a source of educational disadvantage and expressed frustration about falling behind their peers, others demonstrated resilience by relying more heavily on their own writing abilities, reducing their dependence on AI after access was restored, or using domestic AI platforms such as GapGPT when international services became inaccessible. These findings may suggest that learners exercise agency even under conditions of structural constraint by adapting their learning strategies to changing technological circumstances. Consequently, digital-economic capital should be understood not only as a source of educational inequality but also as a context within which learners negotiate access, resilience, and agency in AI-assisted language learning.

Overall, this study makes four contributions to research on AI-assisted language learning. First, it extends Darwin and Norton's investment framework by demonstrating that EFL learners' investment in AI-assisted academic writing is mediated through multiple interconnected forms of capital, including pedagogic-material, psychological, embodied, social, institutionalized, and digital-economic capital. Second, it highlights pedagogic-material and psychological capital as important dimensions of AI-assisted writing that have

received comparatively limited attention in previous investment research. Third, it demonstrates that AI-mediated participation is characterized by important tensions, as increased confidence, collaboration, and autonomy may coexist with diminished authorial voice, emotional distance, and reduced interpersonal interaction. Finally, it shows that institutional ambiguity and digital-economic inequality, particularly during periods of socio-political disruption, shape learners' opportunities to participate in AI-assisted academic writing. Future research should further investigate the long-term development of AI literacy, the evolution of learners' identities and investment in AI-mediated writing, and the ways institutional, technological, and socio-political contexts continue to influence participation in AI-assisted language learning.

## Conclusion

These findings should be regarded as exploratory perceptions rather than evidence of causal relationships or theory development. For these participants, engagement with AI in academic writing was perceived as a site of negotiation, where capital is continually disputed and redefined. Consistent with [Darvin and Norton \(2016\)](#), AI can both legitimize participation and undermine agency by fostering dependency or ethical concerns. Using the Investment Model, findings indicate that learners' investment is shaped not only by motivation but also by structural inequalities, institutional ideologies, and recognition (or devaluation) of existing capital. In line with [Rahaman \(2025\)](#), this underscores the need to address material and social realities beyond psychological motivation. Sustaining investment requires institutions to provide clear guidelines and equitable access to AI tools. Teacher education should integrate AI literacy into EFL pedagogy, equipping instructors to guide ethical use of AI while fostering creativity, collaboration, and transformation rather than reproducing inequalities. This echoes [Soltanian and Ghapanchi \(2021\)](#), who found learners' investment depended on available capital and institutional recognition. Future research could adopt longitudinal or comparative designs to explore how AI use, social capital, and investment evolve across contexts.

This study forms part of a larger research project exploring the role of GenAI in EFL academic writing. The present paper specifically focuses on learners' perceptions of using AI-assisted writing, rather than their performances. Accordingly, the findings are based on the participants' written interviews, semi-structured interviews, and reflective diary reports instead of objective measures of writing performance. No analyses of the students' written texts, classroom observations, or AI interaction logs were undertaken within the scope of this

study. Further research may integrate textual analyses, longitudinal designs, and classroom observations to triangulate these findings and deepen understanding of the relationship between AI-assisted writing, learner investment, and writing development.

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## Appendix A: Interview Guide (Excerpt)

### Minor Theme 1.1: Patterns and Nature of AI Engagement

- Describe the types of generative AI tools you use for English academic writing. How do you usually use them?
- Tell me about the situations or contexts in which AI tools are most helpful for your writing.
- Describe any difficulties, frustrations, or challenges you have experienced while using these AI tools.

### Minor Theme 1.2: Influence on Learning Practices and Investment

- Explain how AI tools have influenced your approach to English academic writing. Can you share an example of a time when AI tools made you engage more effectively or less effectively with your writing?

### Minor Theme 2.1: Peer and Teacher Support

- Describe any conversations you have had with classmates or instructors about using AI for academic writing. What experiences stand out to you? Can you share examples of advice or support you have received from instructors regarding AI use? How did it influence your writing or engagement?

### Minor Theme 2.2: AI's Role in Interaction Patterns

- Reflect on how your use of AI tools has influenced your interactions with classmates and teachers. What positive or negative effects have you noticed?

### Minor Theme 2.3: Access and Belonging

- Have you ever encountered situations where some students may have had more opportunities or advantages due to their familiarity with AI tools? How did this affect your own experience?
- How has using AI influenced your sense of belonging in the English learning community? Are there moments when it made you feel more included or left out?

### Minor Theme 3.1: Institutionalized Social Capital

- Describe any support or resources provided by your university or instructors for using AI in academic writing. How effective have these been?
- How do institutional policies or expectations around AI use affect your interactions with peers and teachers?

### Minor Theme 4.1: Accessibility and Skills

- Describe your experience accessing and using AI chatbots for academic writing. What factors make it easier or more difficult?
- How did you learn to use AI tools effectively? Did you figure it out yourself or with help from others?

### Minor Theme 4.2: Risks and Concerns

- Share your thoughts and feelings about using AI for academic writing. Have you experienced concerns about fairness, academic integrity, or institutional rules?

## Appendix B: Reflective Diary Prompts (Selected ones)

You are invited to write short diary entries about your experiences of using AI tools (e.g., [ChatGPT](#)) for English academic writing. There are no right or wrong answers. We are interested in your personal experiences, thoughts, and feelings. You do not need to respond to all prompts in every entry. Use them as a guide for reflection.

- ✓ You may write in English or Persian.
- ✓ Please submit one diary entry per week for four weeks.
- ✓ Each entry should be approximately 150–250 words. This may take about 5–10 minutes to complete.
- ✓ Please focus on your real experiences, not on what you think is “correct.”
- ✓ Feel assured that all responses will be kept confidential and used only for research purposes.

### Diary Prompts

- Narrate a recent situation in which you used an AI tool (such as [ChatGPT](#)) for your English academic writing. Explain the writing task you were working on, how you used the AI tool, and the type of support it provided (e.g., grammar, vocabulary, ideas, or structure).
- Explain how your use of AI influenced your interactions with classmates. Describe whether and how you exchanged ideas, prompts, or AI-generated texts with peers and how these experiences affected your relationships with them.
- Narrate a specific situation where your access to AI tools and the conditions like free or paid versions, internet speed, filters, or technical problems influenced your writing experience.

## Appendix C: A Sample of Codebook

| Data Extract                                                                                                                               | Initial Interpretive Code                                                   | Candidate Theme                              | Final Theme                       |
|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|----------------------------------------------|-----------------------------------|
| <i>"ChatGPT helps with brainstorming. It helps me organize my thoughts, cleans up my grammar, and makes my writing look much smarter."</i> | AI positioned as an instructional companion that scaffolds academic writing | AI as a pedagogical and writing resource     | <b>Pedagogic-Material Capital</b> |
| <i>"When I wrote with AI support, I felt calmer because I was not afraid of making too many grammar mistakes."</i>                         | AI reduces writing anxiety and enhances confidence                          | AI as emotional support for writing          | <b>Psychological Capital</b>      |
| <i>"When I write clearer prompts in English, AI gives me better explanations."</i>                                                         | Existing language proficiency mediates effective AI use                     | Learner competencies shaping AI engagement   | <b>Embodied Capital</b>           |
| <i>"We sat together and compared what AI suggested for our essays. We talked about different answers and chose the best one."</i>          | AI facilitates collaborative meaning-making among peers                     | AI-mediated peer interaction                 | <b>Social Capital</b>             |
| <i>"My university hasn't provided any official training about using AI."</i>                                                               | Lack of institutional support constrains AI engagement                      | Institutional uncertainty surrounding AI use | <b>Institutionalized Capital</b>  |
| <i>"With the free version, I only get short answers, but my friend's premium AI gives full essays."</i>                                    | Unequal technological access shapes opportunities for AI use                | Digital inequality in AI-assisted writing    | <b>Digital-Economic Capital</b>   |

## Appendix D: A Summary of Findings

| Form of Capital (themes)          | How GenAI Facilitated Investment                                                                                                                                                                                                                                                                             | How GenAI Constrained Investment                                                                                                                                                                                                                                                |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Pedagogic-Material Capital</b> | Provided immediate instructional support (grammar correction, paraphrasing, brainstorming, outlining, vocabulary, organization); expanded linguistic competence; AI-generated templates, drafts, outlines, and writing models functioned as reusable material resources that supported future writing tasks. | AI occasionally generated inaccurate information, grammatical errors, misleading explanations, unnatural language, and misunderstood disciplinary terminology, requiring learners to critically evaluate and revise AI outputs.                                                 |
| <b>Psychological Capital</b>      | Reduced writing anxiety; increased confidence; enhanced learners' sense of legitimacy in academic communication; encouraged greater participation in English academic writing by providing non-judgmental support.                                                                                           | Excessive reliance reduced independent thinking, encouraged cognitive passivity, weakened writing practice, diminished authorial voice, and created feelings of disconnection from learners' authentic selves.                                                                  |
| <b>Embodied Capital</b>           | English proficiency, prompt-crafting skills, disciplinary knowledge, and AI literacy enabled learners to formulate effective prompts, critically evaluate AI outputs, and strategically integrate AI into writing.                                                                                           | Limited English proficiency, weak prompt-writing skills, insufficient disciplinary knowledge, and low AI literacy reduced the quality of AI interaction and encouraged passive acceptance of AI-generated content.                                                              |
| <b>Social Capital</b>             | Facilitated collaboration through sharing prompts, comparing AI outputs, discussing writing strategies, and co-constructing texts; strengthened peer learning and knowledge exchange.                                                                                                                        | Reduced face-to-face interaction with classmates and instructors; decreased reliance on peer support; in some cases created feelings of loneliness, emotional distance, and weaker connections to the learning community.                                                       |
| <b>Institutionalized Capital</b>  | Provided access to valued academic genres, discourse conventions, and writing norms that helped learners align with university expectations.                                                                                                                                                                 | Limited institutional training, unclear AI policies, inconsistent instructor attitudes, and concerns about plagiarism and academic integrity created uncertainty about the legitimacy of AI-assisted writing and constrained learners' investment.                              |
| <b>Digital-Economic Capital</b>   | Reliable internet access, premium AI subscriptions, advanced devices, and (for some learners) domestic AI platforms facilitated more effective AI-assisted writing; some learners developed resilience by relying more on their own abilities or alternative AI tools during periods of disruption.          | Unequal access to premium AI tools, internet connectivity, electricity, and international AI services—particularly during the Israel–Iran war—created digital inequality, limited opportunities for AI-assisted writing, and generated concerns about educational disadvantage. |