

Designing for Academic Literacy Online: A Meta-Analysis of EAP MOOCs and Writing Programs Through Theoretical Lenses and Evidence-Based Frameworks

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ABSTRACT

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With the digital transformation of higher education, online English for Academic Purposes (EAP) courses—encompassing Massive Open Online Courses (MOOCs) and specialized academic writing programs—have become critical vehicles for supporting linguistically diverse learners' acquisition of disciplinary literacy. This meta-analysis synthesizes the design features of 32 representative online EAP courses from leading global institutions, employing content analysis informed by social constructivism, the Community of Inquiry (CoI) model, and genre-based pedagogy. The study systematically examines four core dimensions: disciplinary alignment of curriculum modules, scaffolding of instructional tasks, design of interactive learning environments, and structures of assessment and feedback. Key findings reveal that exemplar courses are distinguished by disciplinary embeddedness (anchoring content in field-specific genres), scaffolded task sequencing (progressing from analysis to production), and intentional interaction design (fostering cognitive and social presence). Conversely, prevalent limitations include inadequate formative feedback mechanisms (overreliance on summative assessment) and underdeveloped academic integrity frameworks (superficial treatment of disciplinary citation norms). The analysis concludes by proposing an integrated, evidence-based framework to guide the design of robust online EAP courses that bridge theoretical rigor and pedagogical effectiveness.

Keywords: Online EAP; Course Design; Meta-Analysis; MOOCs; Academic Literacy; Genre Pedagogy

1. Introduction

Higher education's global digital transformation has intensified the need for robust online English for Academic Purposes (EAP) instruction. As universities worldwide enroll increasingly linguistically diverse cohorts, supporting these learners to navigate the complexities of academic discourse—from disciplinary writing conventions to critical engagement with scholarly texts—has become a core educational priority (Bell, 2024). Online EAP courses, particularly Massive Open Online Courses (MOOCs) and specialized academic writing programs, have emerged as pivotal tools in this effort, offering unparalleled scalability and accessibility across geographic and institutional boundaries (Hakim & Rima, 2024). Yet their ability to foster meaningful academic literacy development depends not on technological delivery alone but on intentional design that responds to the multifaceted demands of academic communication. These demands encompass not only foundational critical thinking skills but also genre awareness—the ability to recognize and reproduce discipline-specific text structures—and mastery of disciplinary communication norms that shape knowledge construction across fields (Sun & Hu, 2020).

Existing EAP research has made significant strides in unpacking effective pedagogical approaches within face-to-face contexts. Scholars like Wingate (2012) have illuminated how classroom-based EAP instruction can scaffold genre competence and disciplinary literacy through interactive, context-

rich activities. However, the shift to online environments has exposed a critical gap: analyses of online EAP course design remain fragmented, with studies focusing on isolated components (e.g., feedback mechanisms or discussion board use) rather than offering a holistic understanding of how design elements interact to support learning. This fragmentation hinders the development of evidence-based guidelines for educators and course designers seeking to create impactful online EAP experiences.

Against this backdrop, the present meta-analysis aims to synthesize current online EAP course design practices. By systematically examining 32 representative courses from leading global institutions, this study unpacks the structural and pedagogical components that characterize effective online EAP instruction. More specifically, it seeks to identify core design principles that align with theoretical frameworks of academic literacy development—including social constructivism, the Community of Inquiry model, and genre-based pedagogy. In doing so, this analysis not only addresses the existing research gap but also distills actionable insights to inform the design of robust, theoretically grounded online EAP courses that meet the needs of linguistically diverse learners in digital higher education.

To guide this synthesis, the present meta-analysis addresses three specific research questions:

- (1) What core design elements characterize effective online EAP courses across disciplinary contexts?

(2) How do these design elements align with theoretical frameworks of academic literacy development, including social constructivism, the Community of Inquiry model, and genre-based pedagogy?

(3) What critical limitations persist in current online EAP design, particularly in the areas of feedback mechanisms and academic integrity instruction?

2. Theoretical Framework

To rigorously analyze online EAP course design, this study anchors its analysis in three interconnected theoretical frameworks, each offering distinct yet complementary insights into how academic literacy develops in digital environments. These frameworks collectively illuminate the cognitive, social, and rhetorical dimensions of effective online EAP instruction.

2.1 Social Constructivism

Social constructivism, rooted in Vygotsky's (1978) sociocultural theory, conceptualizes academic language development as an active, socially mediated process. Key to this framework is the premise that higher-order literacy skills—such as navigating disciplinary discourse and constructing evidence-based arguments—emerge through collaborative interaction with peers, instructors, or cultural tools (Lantolf & Thorne, 2006).

Consider how social constructivist principles inform task design in effective online EAP courses. A hallmark example appears in the University of Edinburgh's Research Communication in English (Campbell et al., 2023), where learners collaboratively deconstruct “gap statements” from published papers in their disciplines. Working in small asynchronous groups, they identify linguistic

markers (“However, existing studies have overlooked...”), discuss how these markers function rhetorically, and co-construct their own gap statements using a shared template. This activity embodies Vygotsky's notion of the zone of proximal development, as interaction with peers and structured materials scaffolds the transition from understanding disciplinary conventions to producing them independently. In contrast, courses that rely solely on pre-recorded lectures on “academic vocabulary” neglect this interactive mediation, reducing learning to decontextualized knowledge transmission—a approach misaligned with social constructivism's core tenets.

2.2 Community of Inquiry (CoI) Model

Garrison, Anderson, and Archer's (2001) Community of Inquiry (CoI) model extends social constructivist principles by articulating the structural conditions required for deep learning in online environments. The model identifies three interdependent elements that collectively foster meaningful educational experiences: cognitive presence, social presence, and teaching presence (Jézégou, 2010).

Cognitive presence refers to the extent to which learners engage in sustained intellectual inquiry—analyzing, evaluating, and constructing knowledge—within the online environment. For EAP learners, this manifests in activities that require critical engagement with academic texts, such as comparing argument structures in humanities vs. STEM research articles or evaluating the validity of evidence in student drafts. Social presence, by contrast, captures the ability of learners to project their personal identities online, building relational connections that support risk-taking and collaborative learning. In EAP contexts,

this might involve learners sharing disciplinary backgrounds in introductory forums or discussing challenges they face in adapting to academic writing conventions, thereby creating a community where linguistic vulnerability is normalized.

Teaching presence integrates the design, facilitation, and direction of learning experiences to sustain cognitive and social presence. In online EAP courses, this includes curating discipline-specific materials, designing scaffolded tasks that progress from analysis to production, and providing targeted feedback that clarifies disciplinary expectations. A compelling illustration of CoI implementation appears in MIT's Design Thinking for Leading and Learning (Reich et al., 2019), where instructors model cognitive presence by annotating sample literature reviews to highlight "signposting language" ("This section contextualizes..."), facilitate social presence through guided peer review forums with structured feedback prompts, and maintain teaching presence via weekly synchronous Q&A sessions addressing disciplinary writing nuances.

Notably, the CoI model diverges from purely technology-centric views of online learning by emphasizing that effective digital environments are not defined by tools alone but by how tools foster these three interwoven presences. This distinction is critical for EAP, where mastery of academic literacy depends not just on accessing content but on engaging with it through purposeful social and cognitive interaction.

2.3 Genre-Based Pedagogy

Genre-based pedagogy, as articulated by Hyland (2019) and rooted in the work of Swales (1990), provides a critical framework for understanding

how academic writing functions as a social practice embedded within disciplinary communities. This perspective challenges the view of academic language as a set of decontextualized linguistic rules, instead framing it as a dynamic system of genre conventions shaped by the rhetorical purposes, values, and power dynamics of specific academic fields. At its core, genre-based pedagogy posits that mastery of academic literacy requires not just grammatical accuracy but genre awareness—the ability to recognize, interpret, and produce texts that align with the expectations of disciplinary communities.

Central to this framework is the distinction between genre (a staged, goal-oriented social process) and text (the linguistic product of that process). For EAP learners, this means understanding that a research article introduction, for instance, is not merely a sequence of sentences but a rhetorical tool designed to establish a research gap, justify significance, and position the study within existing literature—functions that manifest through field-specific linguistic choices. Hyland (2019) emphasizes that these choices are not arbitrary; they reflect what counts as valid knowledge in a discipline, whether through the deductive thesis statements valued in STEM or the inductive argumentation common in humanities.

Effective genre-based EAP instruction operationalizes this understanding through explicit teaching of rhetorical moves—the recurring structural patterns that accomplish genre goals. Consider Stanford University's edX course *Writing in the Sciences* (2023), which exemplifies this approach. In a module on research proposals, instructors guide learners to analyze published STEM proposals to identify moves such as

“establishing background significance” (“Recent advances in CRISPR technology have revolutionized...”) and “stating research objectives” (“This study will test the hypothesis that...”). Learners then practice constructing these moves using discipline-specific vocabulary banks and receive feedback on how well their writing signals these rhetorical intentions. This contrasts with generic EAP courses that teach “essay structure” in isolation, failing to address how structure varies when the genre shifts from a lab report to a literature review or a policy brief.

Genre-based pedagogy also highlights the importance of disciplinary variation, a dimension often overlooked in one-size-fits-all online EAP courses. A striking illustration appears in the University of Melbourne’s Graduate certificate in public health (2025), which explicitly compares results sections across disciplines. Learners analyze how STEM papers use precise numerical claims (“The treatment reduced mortality by 32%”) and passive voice to emphasize methodology, while

social science papers employ tentative language (“These findings suggest a potential correlation”) and integrate contextual interpretation. Such comparisons equip learners to adapt their writing to disciplinary norms, a skill critical for academic participation (Swales & Feak, 2004).

Notably, genre-based pedagogy diverges from traditional skills-based approaches by framing writing as a means of community participation rather than mere communication (seeing table 1). This shift has profound implications for online course design: instead of focusing solely on grammar or vocabulary, effective EAP courses must socialize learners into the rhetorical practices that define their target disciplines. As Hyland (2019) argues, academic writing is ultimately about “doing things with words” within specific communities—whether persuading peers of a theoretical contribution, validating experimental results, or contextualizing historical arguments—and genre-based instruction provides the roadmap for this socialization.

Table 1: Theoretical Framework

Theoretical Framework	Core Constructs	Analytical Dimensions in This Study	Operationalization in Course Analysis
Social Constructivism	Mediated learning, ZPD	Teaching Strategies (Scaffolding)	Task sequencing, peer review protocols
Community of Inquiry (CoI)	Cognitive/Social/Teaching Presence	Interaction Design	Facilitated forums, synchronous workshops
Genre-Based Pedagogy	Genre awareness, disciplinary variation	Core Modules (Disciplinary Alignment)	Field-specific text analysis, rhetorical moves

3. Methodology

This meta-analysis employed a systematic content analysis approach to examine the design features of online EAP courses, guided by the theoretical frameworks outlined in Section 2. The methodology prioritizes transparency in sampling, analytical procedures, and interpretive rigor to ensure the validity and replicability of findings.

3.1 Course Selection

The sample frame consisted of 32 online EAP courses selected through a multi-stage sampling process designed to balance representativeness and relevance. Courses were sourced from three primary channels: prominent global MOOC platforms (Coursera, edX, FutureLearn) and institutional online portals of research-intensive universities with established EAP programs (Perifanou & Economides, 2022). This dual sourcing strategy ensured inclusion of both large-scale, open-access courses and specialized, institution-specific programs, capturing diverse design philosophies and resource allocations.

Inclusion criteria were deliberately stringent to focus on courses with meaningful academic literacy content. Eligible courses must: (1) explicitly target academic writing, reading, or communication skills (excluding general English or professional communication courses); (2) cater to undergraduate or graduate students (or both) navigating academic environments; (3) provide public access to core materials, including syllabi, module outlines, sample lectures, task descriptions, and assessment rubrics (where available). These criteria ensured that course design elements could be systematically analyzed rather than inferred from marketing descriptions.

To enhance disciplinary and contextual diversity, the final sample included courses spanning humanities (e.g., University of Edinburgh's Academic Writing in the Humanities), STEM (e.g., MIT's Scientific Communication for Engineers), and social sciences (e.g., University of California, Berkeley's Social Science Research Writing). Institutional representation included institutions from North America, Europe, and Australasia, reflecting global variations in EAP pedagogy. Notable examples include Stanford University's discipline-specific STEM writing series on edX, the University of Melbourne's graduate-focused EAP program, and FutureLearn's interdisciplinary Academic English for Global Participation offered by a consortium of European universities. Courses ranged in duration from 4-week intensive modules to 12-week comprehensive programs, further ensuring variability in design complexity.

Exclusion criteria eliminated courses lacking transparent content (e.g., those requiring enrollment for syllabus access), K-12 focused programs, and courses primarily teaching general language skills without explicit academic literacy components. This rigorous screening process ensured the sample aligned with the study's focus on intentional academic literacy development in online contexts.

This multi-stage sampling process unfolded in three distinct phases: (1) Initial screening: A pool of 120 candidate courses was identified across target platforms using the inclusion criteria outlined above, ensuring broad coverage of institutional types and disciplinary focuses. (2) Stratified sampling: Courses were stratified by academic discipline (humanities, STEM, social sciences) to achieve proportional representation

(30% humanities, 40% STEM, 30% social sciences), addressing disciplinary biases in EAP pedagogy. (3) Expert validation: Two senior EAP scholars with expertise in online instruction reviewed the stratified sample to verify representativeness of global EAP practices and exclude courses with insufficient academic rigor or content transparency. This rigorous screening reduced the pool to 32 courses, a sample size deemed sufficient to capture design variability while maintaining analytical depth—consistent with meta-analytic standards in educational research (Pae, 2018).

3.2 Analytical Framework

Courses were analyzed using a structured framework derived from the study's theoretical lenses, operationalizing the key dimensions of social constructivism, the CoI model, and genre-based pedagogy. The framework comprised four interrelated analytical dimensions, each with specific coding criteria to guide systematic evaluation. The coding process was executed by two trained coders with doctoral degrees in applied linguistics and 5+ years of EAP teaching experience. Prior to full coding, a pilot phase was conducted using 20% of the sample (7 courses) to refine coding criteria and ensure consistency. Coders independently applied the analytical framework to these pilot courses, with discrepancies resolved through iterative discussion until consensus was reached. For the full dataset, intercoder reliability was measured using Cohen's kappa coefficient, yielding $\kappa = 0.82$ for overall agreement—interpretable as “almost perfect” reliability (Landis & Koch, 1977). All subsequent coding discrepancies were resolved through weekly consensus meetings, with a third EAP scholar consulted for unresolved disagreements. This

rigorous process ensured the reliability of coded data.

3.2.1 Core Modules

Analysis of core modules focused on two interconnected aspects: content specificity and disciplinary alignment. Content specificity was evaluated by identifying focal skills (e.g., research article structuring, literature review composition, academic argumentation, citation practices) and assessing their depth of treatment (e.g., superficial definition vs. contextualized application). Disciplinary alignment was determined by examining whether content referenced field-specific genres (e.g., lab reports in biology, case studies in sociology) or relied on generic academic examples. For instance, courses were coded as “discipline-embedded” if they included discipline-specific text samples, rhetorical move analyses tailored to fields, or tasks requiring application to learners' own disciplines.

3.2.2 Teaching Strategies

Teaching strategies were analyzed through the lens of scaffolding theory and active learning principles. Scaffolding was evaluated by tracking task progression—from introductory (e.g., analyzing model texts) to intermediate (e.g., completing guided templates) to advanced (e.g., independent text production)—and identifying supportive mechanisms (e.g., rubrics, checklists, explicit modeling). Active learning techniques were coded based on opportunities for learner engagement (e.g., interactive exercises, peer collaboration, reflective writing) versus passive content delivery (e.g., static lectures, reading assignments without application tasks). The presence of explicit genre instruction, such as teaching rhetorical moves or

disciplinary language features, was also documented.

3.2.3 Interaction Design

Interaction design analysis operationalized the CoI model's three presences. Cognitive presence was assessed by examining tasks requiring critical analysis, synthesis, or evaluation of academic content. Social presence was evaluated through opportunities for learner-learner interaction (e.g., discussion forums, peer review) and the extent to which such interactions were structured (e.g., guided prompts vs. open-ended posts). Teaching presence was coded by identifying instructor roles, including content curation, facilitation of discussions, and provision of targeted feedback. Learner-content interaction was evaluated based on the interactivity of materials (e.g., hyperlinked resources, embedded quizzes, adaptive learning paths) versus static content delivery.

3.2.4 Evaluation Methods

Evaluation methods were analyzed across three dimensions: formative feedback mechanisms, summative assessment design, and academic integrity frameworks. Formative feedback was evaluated by examining frequency (e.g., per-module vs. end-of-course), specificity (e.g., holistic comments vs. targeted annotations on rhetorical moves), and modality (e.g., automated, peer, or instructor feedback). Summative assessments were coded by type (e.g., research proposals, literature reviews, argumentative essays) and alignment with course objectives. Academic integrity measures were evaluated by identifying explicit instruction on disciplinary citation norms, plagiarism prevention strategies, and the use of integrity tools (e.g., citation tutorials, similarity checks).

To distinguish “exemplar courses” from less effective ones, a criterion-based rubric was developed based on the study's theoretical frameworks. Exemplar courses were defined as those demonstrating integration of at least three of the following core features: (1) explicit disciplinary alignment with field-specific genres; (2) scaffolded task sequences progressing from analysis to production; (3) structured interaction designs fostering cognitive and social presence; (4) iterative formative feedback targeting both linguistic and rhetorical dimensions. This operationalization ensured that “effectiveness” was grounded in theoretical principles rather than subjective judgment, aligning with the study's focus on evidence-based design.

4. Findings

4.1 Core Modules: Disciplinary Specificity as a Hallmark of Effective Design

A defining feature of pedagogically robust online EAP courses is their deliberate alignment with disciplinary genres, transcending generic “academic writing” instruction to address the unique rhetorical demands of specific fields. This alignment manifests in curricula that embed genre-specific content, tools, and examples drawn directly from disciplinary discourse communities.

Consider Stanford University's edX course *Writing in the Sciences* (2023), which exemplifies disciplinary embeddedness through its module on scientific abstracts—a genre central to STEM communication. The module begins with interactive analysis of 10 published abstracts from *Nature* and *Science*, where learners use a digital annotation tool to label mandatory components: background context (“CRISPR-Cas9 technology

has revolutionized gene editing”), research gap (“However, off-target effects remain poorly characterized”), methodology (“We developed a machine learning model to predict off-target sites”), key findings (“The model reduced off-target errors by 47%”), and implications (“This advances precision gene editing in clinical applications”). Learners then complete a scaffolded drafting task: first filling in a template with discipline-specific prompts (“State your hypothesis using measurable outcomes”), then revising based on instructor feedback focused on STEM-specific conciseness. This design anchors learning in authentic disciplinary practices, moving beyond generic advice to teach how STEM communities communicate knowledge.

In contrast, courses adopting a one-size-fits-all approach struggle to foster meaningful disciplinary literacy. The University of California, Irvine’s Classcentral offering *Academic English: Writing* (2022) demonstrates this limitation. While the course covers universally relevant skills—such as thesis development and paragraph cohesion—its examples derive predominantly from humanities essays. A module on “evidence integration,” for instance, uses literary analysis excerpts to teach citation techniques, with minimal attention to how STEM disciplines prioritize numerical data or how social sciences value contextualized qualitative evidence. This genericism forces learners from non-humanities fields to undertake the cognitive labor of translating abstract principles to their own disciplinary contexts, a burden that genre-based pedagogy explicitly seeks to alleviate (Swales & Feak, 2004).

Notably, high-impact courses further distinguish themselves by cultivating metalinguistic

awareness—the ability to articulate and reflect on disciplinary language choices. The University of Edinburgh’s *An Introduction to Art History* (2025) operationalizes this through its “Art Historical Discourse Toolkit” module, tailored to the rhetorical conventions of art historical analysis. Rather than comparing across distant disciplines, learners examine parallel excerpts from art historical scholarship focusing on Renaissance and Baroque painting, analyzing how language constructs disciplinary arguments about style, context, and significance.

In one activity, participants deconstruct passages from two seminal texts: one discussing Leonardo da Vinci’s *Mona Lisa* (Renaissance) and another analyzing Caravaggio’s *The Calling of St. Matthew* (Baroque). They identify distinct rhetorical moves: descriptions of Renaissance works emphasize “harmonious proportion,” “subtle sfumato,” and “humanist idealism,” using precise technical terminology to anchor claims in visual evidence. In contrast, discussions of Baroque art employ language of “dramatic chiaroscuro,” “dynamic movement,” and “emotional immediacy,” framing analysis through the period’s emphasis on theatricality. Instructors explicitly label these as “style-signaling moves,” guiding learners to note how terms like “compositional balance” (Renaissance) versus “narrative tension” (Baroque) function not just as descriptors but as tools to position artworks within historical trajectories.

Equally significant is how effective courses integrate disciplinary variation in core skills like argumentation. MIT’s *Design thinking for leading and learning* (2019) includes a comparative module titled “Building Arguments Across Fields,” which presents side-by-side examples of literature

reviews from computer science and history. Learners identify how computer science reviews prioritize methodological novelty (“This approach advances existing algorithms by...”) while history reviews emphasize historiographical positioning (“This study complicates the interpretation by...”). Such explicit comparison prevents learners from internalizing a singular “academic writing” norm, instead fostering the adaptive competence required to navigate diverse disciplinary expectations.

4.2 Teaching Strategies: Scaffolding and Modeling as Catalysts for Learning

Scaffolded instruction emerged as a defining feature of successful online EAP courses, with instructional design systematically sequencing tasks to move learners from guided analysis to independent production. This approach, rooted in Vygotsky’s (1978) zone of proximal development, provides temporary, targeted support that diminishes as learners gain competence—effectively bridging current abilities and potential growth through structured assistance.

MIT’s Design Thinking for Leading and Learning (2019), hosted on MIT OpenCourseWare, exemplifies rigorous scaffolding in its module on structuring design proposals—a core genre in design thinking practice. A signature activity, the “guided reconstruction task,” engages learners in reorganizing 12 jumbled components of a design proposal into a coherent sequence aligned with design thinking frameworks. Using an interactive digital worksheet, participants drag-and-drop elements into thematic sections labeled “Problem Framing,” “User Need Identification,” and “Prototype Objectives,” with embedded prompts prompting critical justification: “Why does ‘User interviews revealed unmet accessibility needs’

belong in the User Need section? How does this detail ground the proposal in empirical insight?”

Upon submission, the platform delivers immediate targeted feedback: flagging misaligned elements (e.g., “Prototype testing methodology” placed in the Problem Framing section) and linking to annotated model proposals that explain disciplinary conventions specific to design thinking—such as prioritizing user-centric language (“This addresses X pain point identified in user research”) over technical jargon in early-stage proposals. Completed in 45 minutes, this task bridges analytical understanding of design proposal structure and practical production, with structured support gradually fading as learners advance to drafting their own proposals independently. This scaffolded progression reflects the course’s emphasis on translating design thinking principles into actionable communication—a hallmark of effective online instruction rooted in social constructivist principles (Vygotsky, 1978).

Equally critical to effective scaffolding is intentional modeling of expert practices, which helps demystify disciplinary writing conventions that may appear opaque to novice learners. The University of Auckland’s Drawing as Creative Thinking (2025) employs this strategy in its literature review module, where instructors record think-aloud videos analyzing how they identify thematic connections across sources. In one clip, an engineering instructor verbalizes: “I notice both studies use finite element analysis, but they apply it to different materials—this discrepancy could be a useful gap to explore.” Such modeling makes visible the implicit cognitive processes experts use, transforming abstract advice (“synthesize sources”) into

into concrete, observable strategies (Hyland, 2019).

In contrast, less effective courses relied on passive content transmission, treating EAP instruction as a mere transfer of information rather than a developmental process. Consider a prominent Coursera MOOC titled *Academic Writing and Research* (2022), which structured its argumentation module around six hours of pre-recorded lectures detailing “claim-evidence-warrant” frameworks, supplemented with static slides defining logical fallacies. While theoretically sound, the course provided no opportunities for guided practice: learners were directed to “write an argumentative paragraph” in the final quiz without intermediate tasks, feedback, or examples of common pitfalls (e.g., overgeneralization in social science claims). This approach reflects a transmissionist worldview that conflates exposure to content with learning, neglecting the interactive, iterative processes required to internalize academic writing strategies. Such courses fail to operationalize scaffolding’s core principle: that competence develops not through passive reception but through guided, incremental engagement with disciplinary practices.

4.3 Interaction Design: Fostering Cognitive and Social Presence

Within the Community of Inquiry (CoI) framework, meaningful online learning emerges through intentional design that cultivates cognitive presence (intellectual engagement), social presence (relational connection), and teaching presence (instructional guidance). Analysis of effective EAP courses revealed that their interaction design transcended passive content consumption, instead structuring purposeful exchanges that mediated disciplinary literacy development through

collaborative meaning-making.

The Open University’s *English for academic purposes online* (2023) exemplifies this approach through its layered interaction architecture. Central to its design are asynchronous forums focused on thesis statement development, where learners submit draft claims alongside brief rationales explaining their alignment with disciplinary conventions (e.g., “This hypothesis follows social science norms by specifying variables”). Peers then provide feedback using a structured rubric that prompts critical engagement: “Does the thesis identify a specific knowledge gap? Is its scope appropriate for the field? What disciplinary evidence would strengthen its validity?” Instructors actively moderate these exchanges, inserting targeted interventions to clarify genre-specific misconceptions—such as distinguishing between the predictive hypotheses expected in psychology (“X will correlate with Y”) and the exploratory research questions valued in anthropology (“How do X and Y intersect in context Z”). This design integrates all three CoI presences: cognitive presence through analytical feedback, social presence through constructive dialogue, and teaching presence through instructor scaffolding of disciplinary expectations.

It enhances interaction through its “disciplinary debate forum” activity. Learners are assigned opposing positions on a field-specific claim (e.g., “Quantitative methods are superior for social science research” for social science learners) and must support their arguments using 2–3 peer-reviewed sources. The forum includes structured prompts: “Cite a disciplinary authority to validate your claim (e.g., reference Bourdieu [1991] for social theory)” and “Address counterarguments

using hedging language appropriate to your field (e.g., ‘While some scholar suggests X, our data indicates Y’).” Instructors moderate by highlighting disciplinary discourse patterns: noting how social science learners use contextualized examples while STEM learners prioritize empirical evidence. This activity fosters both cognitive presence (critical analysis) and social presence (collaborative debate) through discipline-specific interaction.

Notably, high-impact courses also leveraged synchronous interaction to deepen engagement, particularly for complex rhetorical concepts. The University of Pennsylvania’s *Publishing Your Research: Writing Journal Articles and Book Chapters* (2025) incorporates weekly 90-minute virtual workshops where learners collaboratively revise literature review excerpts. In one session observed, participants used shared digital whiteboards to map argument structures, with instructors modeling how to identify “counterclaim integration” in STEM vs. humanities texts: “Notice how this biology paper addresses counterevidence upfront to strengthen its methodology, while this history article weaves counterperspectives throughout to contextualize its argument.” These synchronous sessions foster social presence through real-time dialogue, while instructors’ modeling reinforces teaching presence by making disciplinary reasoning visible.

Learner-content interaction, often overlooked in online design, emerged as another critical dimension. Imperial College London’s *Creative Thinking: Techniques and Tools for Success* (2025) enhances this through interactive genre toolkits: learners access discipline-specific writing templates embedded with “click-to-explain” annotations that

link linguistic choices to rhetorical functions. For instance, a engineering research proposal template includes pop-ups explaining that “The phrase ‘preliminary data suggest’ signals tentative claims typical in early-stage research,” prompting learners to reflect on how to adapt such language for their own work. This design transforms static materials into interactive mediational tools, scaffolding cognitive presence through guided content engagement (Lantolf & Thorne, 2006).

In stark contrast, courses with underdeveloped interaction design failed to cultivate meaningful CoI presences. A 2023 Coursera offering titled *Introduction to academic writing* illustrates this limitation: while it included discussion boards for learners to post essay drafts, the platform provided no rubrics, facilitation guidelines, or instructor moderation. Consequently, exchanges remained superficial, dominated by generic affirmations (“Clear writing!”) or unfocused critiques (“I didn’t agree”). Such design undermines social constructivist principles, as learners lack the structured support needed to engage in productive knowledge co-construction (Vygotsky, 1978). Worse, it creates a false sense of interaction—technically present but pedagogically inert—failing to foster the cognitive or social presence required for deep academic literacy development.

The disparity between these approaches underscores a key insight: interaction in online EAP courses is not merely about frequency of communication but about quality of engagement. Effective design structures interactions to target specific disciplinary literacy goals, whether through guided peer review of research claims, instructor-facilitated analysis of rhetorical moves, or interactive content that connects language choices

to disciplinary purposes. Without such intentionality, interaction becomes a perfunctory feature rather than a catalyst for learning.

4.4 Evaluation Methods: Gaps in Formative Feedback and Academic Integrity

Evaluation practices in online EAP courses revealed striking disparities in effectiveness, particularly in how feedback and academic integrity were operationalized. These disparities directly influenced the courses' ability to foster sustained academic literacy development, as assessment design emerged as a critical mediator between instruction and learning outcomes.

4.4.1 Formative Feedback: From Iterative Support to Superficial Assessment

Formative feedback—defined as ongoing, actionable guidance that supports revision and metacognitive awareness—emerged as a cornerstone of high-impact courses. Consider the University of Pennsylvania's *Publishing your research: Writing journal articles and book chapters* (2025), which structured its assessment around a deliberate “draft-review-revise” cycle embedded within each module. For the research proposal assignment, learners submit a preliminary outline receiving instructor feedback annotated with both rhetorical and linguistic guidance: “Your research question effectively identifies a disciplinary gap, but the methodology section requires more specific operational definitions—refer to the engineering case study in Module 4.2 to model precision in tool descriptions.” This feedback is delivered within 72 hours, allowing learners to revise before submitting a full draft, which then undergoes peer review using instructor-developed rubrics focused on disciplinary alignment (e.g., “Does the literature

review prioritize recent empirical studies, as is standard in social psychology?”). Final submissions include a reflection statement where learners articulate how they addressed feedback, fostering metacognitive awareness—a practice aligned with social constructivist principles that frame feedback as a dialogic tool for cognitive growth.

In stark contrast, most courses relied on summative assessment models that prioritized final products over developmental processes. A prominent edX course titled *Academic English: How to Write an Essay* (2025) exemplifies this limitation. Learners completed three modules on essay structure, source integration, and argumentation, yet their only formal assessment was a single 2,000-word essay submitted at the course's conclusion. Feedback consisted of a numerical score (out of 100) and generic comments such as “Strong thesis but underdeveloped evidence” or “Good organization,” with no specific guidance on revising weaknesses or connecting feedback to disciplinary norms. This approach mirrors Storch's (2018) observation that online EAP contexts often reduce feedback to evaluative judgments rather than instructional dialogue, failing to leverage assessment as a tool for learning. Such practices undermine the CoI model's emphasis on teaching presence, as instructors miss opportunities to guide cognitive development through targeted feedback.

4.4.2 Academic Integrity: From Procedural Warnings to Disciplinary Socialization

Academic integrity instruction similarly varied in depth and relevance, with most courses treating plagiarism as a technical violation rather than a cultural practice shaped by disciplinary norms. While 18 of the analyzed courses included mandatory orientation modules with plagiarism

warnings—typically consisting of slides defining “unoriginal content” and citing institutional penalties—only three integrated explicit, genre-based instruction on integrity practices.

Imperial College London’s course stood out in this regard, embedding integrity training within disciplinary contexts. In its module on “Scholarly Communication Ethics,” learners analyze side-by-side examples of citation practices in materials science and history. They compare how STEM papers prioritize precise attribution of methods (“Following the protocol developed by Oon et al. [2020] for alloy testing”), while humanities texts emphasize interpretive engagement (“As Said (1978) argues, colonial discourse functions through...”). Instructors explicitly discuss how author order conventions—where STEM papers prioritize contributorship over seniority, unlike some humanities fields—reflect disciplinary values, framing integrity not as rule-following but as participation in scholarly communities (Sun & Hu, 2020).

Notably, none of the MOOCs in the sample incorporated plagiarism detection tools or mechanisms to verify authorship, creating significant validity concerns. A FutureLearn course on Introduction to Academic Reading and Writing (2025) relied solely on honor codes, despite featuring peer-reviewed assignments where originality could not be systematically verified. This oversight contrasts with campus-based EAP programs, which often combine technological tools with instructional guidance, highlighting a critical scalability challenge for online platforms. As is emphasized, academic integrity in EAP cannot be addressed through warnings alone; it requires explicit instruction in how disciplinary conventions shape what counts as ethical practice—a dimension largely missing from mainstream online offerings.

Table 2 summarizes the key distinctions between exemplary and weak course features across the analyzed dimensions, highlighting the practical implications of intentional design choices.

Table 2. Features of Exemplary vs. Weak Online EAP Courses

Design Dimension	Exemplary Course Feature (Example)	Weak Course Feature (Example)
Disciplinary Alignment	Stanford’s Writing in the Sciences teaches STEM abstract structure using Nature examples.	Coursera’s Academic English: Writing uses generic essay examples across all disciplines.
Scaffolding	MIT’s guided reconstruction task with interactive sentence rearrangement and justification prompts.	Coursera’s Academic Writing Essentials relies on 6-hour lectures with no intermediate tasks.
Interaction	Open University’s structured debate forums with	Coursera’s Academic Reading and Writing has unmoderated

	disciplinary prompts and instructor moderation.	forums with generic feedback.
Feedback	UPenn's iterative draft-review cycle with 72-hour disciplinary feedback.	edX's Academic Essay Writing provides only final scores with generic comments.

5. Discussion

5.1 Effective Design Principles

The meta-analysis synthesizes four interconnected principles that distinguish effective online EAP course design, each grounded in theoretical frameworks and validated by exemplary practices observed across the analyzed courses. These principles collectively address the multifaceted nature of academic literacy development in digital environments, bridging theoretical rigor with pedagogical pragmatism.

5.1.1 Disciplinary Embeddedness: Grounding Literacy in Genre-Specific Practices

This principle of disciplinary embeddedness directly operationalizes genre-based pedagogy (Hyland, 2019), which conceptualizes academic writing as a social practice shaped by disciplinary knowledge-making conventions. By anchoring content in field-specific genres, these courses align with Swales' (1990) emphasis on genre awareness as foundational to academic community participation. Effective courses move beyond generic instruction in "academic writing" to explicitly teach how meaning is constructed within disciplines: for instance, Stanford University's Writing in the Sciences (2023) teaches learners to frame research questions using the precise, hypothesis-driven language valued in STEM, while the University of Edinburgh's unpacks the

tentative, context-dependent argumentation norms of humanities scholarship. Such embedding equips learners not merely to produce grammatically correct texts but to participate meaningfully in disciplinary discourse—a distinction that aligns with genre-based pedagogy's emphasis on writing as social practice (Swales, 1990).

5.1.2 Scaffolded Active Learning: Sequencing for Developmental Growth

Scaffolded active learning materializes social constructivist principles (Vygotsky, 1978), which posit that cognitive development emerges through guided interaction with more knowledgeable others or structured tools. The sequenced progression from analysis to production mirrors Vygotsky's zone of proximal development, where temporary support enables learners to achieve disciplinary writing competence they could not attain independently. Effective online EAP courses implement scaffolded active learning, structuring tasks to progress deliberately from analysis of expert models to independent production of disciplinary texts. This approach materializes Vygotsky's (1978) zone of proximal development, where temporary support enables learners to tackle challenges beyond their current ability. MIT's Design thinking for leading and learning (2019) exemplifies this sequencing: learners first deconstruct literature reviews to identify structural patterns, then complete guided outlines with genre-

specific prompts, before drafting their own work with checklists that fade as competence develops. Critical to this principle is the integration of modeling—making visible the implicit cognitive processes experts use, such as how to prioritize evidence in STEM results sections. Unlike passive content delivery that treats writing as a set of static rules, scaffolded active learning fosters metacognitive awareness, enabling learners to transfer skills across contexts.

5.1.3 Purposeful Interaction: Cultivating Communities of Inquiry

Purposeful interaction operationalizes the Community of Inquiry (CoI) model (Garrison et al., 2001), which emphasizes cognitive presence (intellectual engagement), social presence (relational connection), and teaching presence (instructional guidance) as interdependent pillars of meaningful online learning. By structuring interactions to target disciplinary literacy goals, these courses foster the collaborative meaning-making central to the CoI framework. Effective courses design interactions not as optional add-ons but as core mechanisms for learning, structuring opportunities for learners to engage critically with content and connect with peers. The Open University's course illustrates this through asynchronous forums where learners post thesis statements and provide feedback using rubrics focused on disciplinary alignment—with instructors actively moderating to clarify misconceptions, such as distinguishing between “hypotheses” in social sciences and “research questions” in qualitative studies. This design cultivates cognitive presence through critical analysis and social presence through collaborative meaning-making, transforming isolated online

learning into a community-driven process that mirrors face-to-face EAP's interactive strengths (Storch, 2018).

5.1.4 Formative Feedback Loops: Prioritizing Timely, Actionable Guidance

Formative feedback loops bridge social constructivist and CoI principles: they reflect social constructivism's focus on dialogic mediation of learning (Storch, 2018) while reinforcing teaching presence (Garrison et al., 2001) through targeted instructor guidance. This iterative feedback aligns with the view that academic writing development is a process requiring ongoing, context-specific scaffolding rather than one-time evaluation. Effective courses embed iterative feedback cycles that target both linguistic accuracy and rhetorical effectiveness, providing timely, specific guidance that enables revision. The University of Pennsylvania's course embodies this through its “draft-review-revise” model: instructors provide annotated feedback on first drafts (e.g., “This claim requires stronger disciplinary evidence—see Module 4.2 for strategies to integrate field-specific citations”), peers offer additional perspectives using structured prompts, and learners revise before final submission. Such loops address a key limitation of summative-only assessment, which fails to support the incremental nature of academic writing development (Storch, 2018). Critically, feedback in these courses is disciplinary specific—distinguishing, for example, between acceptable paraphrasing in humanities and the precise citation of methods in STEM—ensuring relevance to learners' field-specific needs.

Collectively, these principles reflect a paradigm shift in online EAP design: from generic skill transmission to intentional cultivation of

disciplinary literacy through theoretically grounded, learner-centered practices. Their interconnectedness is notable—disciplinary embeddedness provides the content focus, scaffolded learning sequences the development, purposeful interaction fosters community engagement, and formative feedback drives continuous improvement—together creating a holistic framework for effective online EAP instruction.

5.2 Critical Limitations

Despite the strengths identified in exemplary courses, two significant limitations emerged across the analyzed online EAP programs, reflecting broader tensions in digital academic literacy instruction.

The first critical gap lies in the widespread deficit in formative feedback mechanisms. Across most courses, assessment design remained entrenched in summative evaluation—final essays, quizzes, or peer reviews conducted without intermediate guidance—revealing a fundamental misunderstanding of EAP as a product-oriented skill rather than a developmental process requiring ongoing scaffolding (Storch, 2018). For instance, a prominent edX course on academic writing structured its assessment around a single final research proposal, with feedback limited to a rubric score and generic comments such as “Effective structure but needs stronger evidence.” This approach fails to address the iterative nature of academic writing, where learners require targeted feedback on specific rhetorical choices (e.g., how to frame a research gap or integrate disciplinary citations) at critical stages of drafting. Notably, this deficit contradicts social constructivist principles, which emphasize that learning thrives through

guided interaction with expert feedback—opportunities systematically denied in courses prioritizing final products over process.

Second, academic integrity instruction remained marginalized, treated as an afterthought rather than a core component of disciplinary socialization. While nearly all courses included perfunctory plagiarism warnings (e.g., “Cite all sources to avoid academic misconduct”), such guidance rarely transcended surface-level rule enforcement to address the cultural and disciplinary dimensions of ethical writing. For example, a Coursera course on academic communication included a 10-minute video on citation formats but omitted discussions of how disciplinary norms shape integrity practices: in STEM fields, for instance, author order signifies intellectual contribution, while humanities disciplines prioritize precise paraphrasing over direct quotation (Sun & Hu, 2020). Only three courses—including Imperial College London’s program—addressed these nuances, guiding learners to compare citation practices in their target journals and analyze cases where “proper citation” varies by field. Worse, none of the MOOCs in the sample integrated plagiarism detection tools or structured activities to practice ethical source use, creating a dangerous disjuncture between assessment expectations and instructional support. This oversight perpetuates the myth that academic integrity is a universal set of rules rather than a context-dependent practice, leaving learners ill-equipped to navigate the ethical complexities of their disciplines.

Our analysis reveals that 75% of courses (24/32) relied exclusively on summative assessment, a pattern more severe than previously documented in EAP contexts (Storch, 2018). For example, edX’s

How to write an essay (2025) structured assessment around a single 2,000-word final essay, with feedback limited to a numerical score and generic comments like “Underdeveloped evidence”—providing no guidance on revising rhetorical choices (e.g., how to integrate disciplinary citations) or addressing field-specific gaps. This overreliance on summative evaluation contradicts social constructivist principles, as learners were denied the iterative feedback needed to internalize academic writing processes.

In academic integrity instruction, 81% of courses (26/32) reduced ethics to plagiarism warnings, with only 9% (3/32) addressing disciplinary nuances. Coursera’s Introduction to academic writing (2023), for instance, included a 10-minute video on citation formats but omitted discussions of how author order conventions differ between STEM (contributorship-based) and humanities (seniority-based) fields—a oversight that leaves multilingual learners vulnerable to unintentional misconduct (Sun & Hu, 2020). Worse, none of the 18 MOOCs in the sample integrated plagiarism detection tools, creating validity concerns in peer-reviewed assignments where originality could not be verified.

This study’s core innovation lies in its integration of theoretical rigor and empirical synthesis to propose an interconnected design model—one that transcends the siloed approaches of existing literature. Unlike prior studies focusing on isolated elements (e.g., feedback mechanisms in Storch, 2018; genre analysis in Caplan & Johns, 2022), we demonstrate that effective online EAP design requires the coexistence of disciplinary embeddedness, scaffolded learning, purposeful interaction, and formative feedback as mutually reinforcing pillars. This interdependence

challenges the dominant “checklist” approach to EAP course design, showing that disciplinary specificity alone (without scaffolded practice) or interaction without feedback fails to foster sustained academic literacy. Furthermore, by operationalizing three theoretical frameworks simultaneously, we bridge a key divide in EAP scholarship: between social constructivist accounts of interaction, genre-based focus on disciplinary conventions, and CoI models of online community—offering a unified lens previously missing in online EAP research.

6. Conclusion

This meta-analysis systematically synthesizes the design features of online EAP courses, revealing that effectiveness in fostering academic literacy is not accidental but stems from intentional alignment with theoretical principles and disciplinary realities. The findings underscore four interconnected pillars of robust online EAP design: disciplinary embeddedness that anchors learning in field-specific genres; scaffolded active learning that sequences tasks from analysis to independent production; purposeful interaction that cultivates cognitive and social presence; and formative feedback loops that guide iterative improvement. Together, these elements operationalize social constructivist, Community of Inquiry, and genre-based pedagogical frameworks, translating theoretical insights into tangible instructional practices.

The study also highlights critical disjunctions between current practices and optimal design principles. The prevalent overreliance on summative assessment and generic feedback mechanisms reflects a persistent misconceptualization of EAP as a static set of

skills rather than a developmental process requiring ongoing guidance—undermining the social constructivist emphasis on mediated learning. Similarly, the superficial treatment of academic integrity, often reduced to plagiarism warnings rather than explicit instruction in disciplinary citation norms, fails to prepare learners for the nuanced ethical demands of academic participation, as emphasized in genre-based pedagogy. These gaps not only hinder immediate learning outcomes but also limit learners' long-term ability to navigate disciplinary discourse communities.

For educators and course designers, these findings offer actionable guidelines for enhancing online EAP instruction. Priority should be given to embedding discipline-specific genre instruction, designing progressive task sequences with explicit modeling, facilitating structured interactions that deepen disciplinary thinking, implementing timely and rhetorically focused feedback, and integrating academic integrity as a cultural practice rather than a procedural rule. Such adjustments would transform online EAP courses from generic skill-

transmission platforms into sites of meaningful academic socialization.

This analysis is not without limitations, particularly its focus on publicly accessible course materials rather than direct learner outcomes. Future research should therefore explore the scalability of these design principles in large-enrollment MOOCs, where maintaining interaction quality and feedback timeliness presents unique challenges. Additionally, longitudinal studies examining how online EAP design influences long-term academic performance across disciplines would strengthen the evidence base for effective practice. Investigations into how these principles adapt to diverse learner populations—including multilingual writers with varying prior academic experiences—would further enhance the inclusivity of online EAP provision. Ultimately, advancing online EAP design requires sustained commitment to theoretical rigor, disciplinary relevance, and learner-centered innovation, ensuring that digital platforms become equitable pathways to academic literacy for all.

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