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Self-Directed Learning Modules for Postgraduate Academic Writing: A Systematic Review (2020–2025) and Proposed Educational Framework

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Abstract: This systematic review investigates how self-directed learning (SDL) modules support postgraduate academic writing instruction. Articles were identified through Google Scholar searches using the Publish or Perish application, limited to publications from 2020–2025. Following PRISMA procedures, eligible studies were screened and synthesized to evaluate reported impacts of SDL-based modules on academic writing development and to map recurring implementation constraints. The synthesis shows that SDL modules commonly strengthen writers' conceptual clarity, rhetorical organization, and citation practices, while also improving learner autonomy, confidence, and self-regulation during drafting and revision. However, the literature reveals persistent weaknesses: module designs are often under-specified methodologically, learner readiness varies due to unequal digital and academic literacy, and evidence remains dominated by non-experimental designs with limited longitudinal tracking particularly within Indonesian higher-education settings. The novelty of this review lies in consolidating recent SDL-module evidence specific to postgraduate academic writing while foregrounding Indonesian scholarship within the broader international conversation. Practically, the findings suggest that scalable SDL modules should embed explicit learning pathways, guided reflection, and transparent assessment rubrics, alongside targeted supports for digital and academic literacy. Overall, this study contributes an updated evidence map and a research agenda encouraging more rigorous experimental and multi-site longitudinal studies across disciplines and institutions.

Keywords: Academic Writing Instruction, Postgraduate Students, Self-Directed Learning Modules, Systematic Review

A. Introduction

Academic writing is a core competency for postgraduate students because it underpins thesis completion, publication in scholarly journals, and participation in global academic discourse (Hyland & Jiang, 2019). In many universities, particularly

in developing contexts, postgraduate students are expected to produce research reports, journal articles, and conference papers in English to meet institutional requirements and intensifying international publication pressures (Di Bitetti & Ferreras, 2017).Yet evidence from higher education shows that even at advanced stages of study, supervisors and lecturers frequently encounter persistent problems such as weak research framing, poorly organized arguments, limited control of genre conventions, and inaccurate integration of sources (Hawari et al., 2022; Nurkamto et al., 2022). These difficulties suggest that traditional lecturer centered and largely remedial approaches to academic writing instruction are insufficient for the complex literacy demands of contemporary postgraduate education. More curriculum embedded, scalable, and development-oriented models of academic writing support are therefore needed (Wingate, 2012).

A promising orientation for such support is self-directed learning. Self-directed learning positions learners as active agents who diagnose learning needs, set goals, select strategies, and evaluate progress, often with the support of structured learning resources and digital tools. Conceptually, self-directed learning is closely aligned with self-regulated learning, which provides a stronger explanatory lens for how learners manage cognition, motivation, and behavior during learning tasks. In Garrison's model, self-directed learning is shaped by the interaction of self-management, self-monitoring, and motivation, highlighting that effective self-direction requires both control of learning resources and metacognitive oversight. Zimmerman's self-regulated learning framework similarly conceptualizes learning as a cyclical process involving forethought, performance, and self-reflection, in which learners plan strategically, monitor progress while performing a task, and evaluate outcomes to adapt future strategies. These models are particularly relevant to academic writing because writing is an extended and recursive activity that depends on sustained regulation of planning, drafting, revising, responding to feedback, and managing affect and persistence across time.

Postgraduate students constitute a distinct population with writing support needs that go beyond those typically addressed in undergraduate writing courses. Postgraduate writing is high stakes and research intensive, involving the production of theses and publishable manuscripts that require stronger disciplinary positioning, methodological clarity, evaluative argumentation, and an authoritative scholarly voice. Postgraduates also operate within supervision-based ecosystems in which expectations are often implicit, feedback is unevenly available, and time constraints shape writing development. In EFL contexts, these challenges are further amplified by linguistic demands, unequal access to research resources, and the need to meet international journal conventions while navigating local institutional pressures. For these reasons, postgraduate academic writing support must extend beyond skills remediation to include systematic development of self-regulation capacities that enable learners to sustain writing progress independently across long term projects.

Within this landscape, self-directed learning modules provide a potentially scalable mechanism for strengthening postgraduate academic writing. Modules can operationalize self-directed and self-regulated learning principles by offering sequenced learning pathways for research genres and rhetorical moves, embedded prompts for metacognitive regulation, and transparent criteria through rubrics and self-assessment tools. Empirical studies on self-directed learning-oriented writing interventions generally report positive outcomes, including improved clarity of ideas, stronger rhetorical organization, better citation practices, and increased confidence and autonomy. Digital tools and AI supported feedback systems can further function as micro modules that support self-monitoring and iterative revision when they are embedded in pedagogical routines that encourage reflective use rather than uncritical acceptance of automated suggestions.

However, the existing literature also reveals substantial gaps. Research on self-directed learning modules for academic writing is fragmented across disciplines, institutions, and countries, and many studies provide limited detail on the theoretical and instructional design rationales underlying module development. This limits replication and scaling and makes it difficult to identify which features are essential and which are context dependent. Moreover, evidence in Indonesia and comparable EFL and Global South settings remains dominated by short term and non-experimental designs, with relatively few quasi experimental, experimental, or longitudinal studies that can support stronger causal inference and durable impact claims. Without a consolidated synthesis, educators and institutions lack clear evidence-based guidance for developing modules that are theoretically grounded, practically implementable, and responsive to the realities of postgraduate writing.

This systematic review addresses these needs by synthesizing empirical studies published between 2020 and 2025 on self-directed learning modules and self-directed learning-oriented environments for postgraduate academic writing. To the best of our knowledge, this is the first PRISMA guided systematic review that focuses specifically on self-directed learning modules for postgraduate academic writing and interprets the evidence through an explicit self-directed and self-regulated learning lens. The review further foregrounds EFL and Global South contexts, including Indonesia, where scalable writing support is urgently needed and where institutional and cultural conditions may shape implementation and outcomes. By mapping conceptualizations and operationalization's, summarizing reported effects, and identifying implementation challenges and evidence gaps, the review also informs the development of an educational framework for module design, institutional integration, and future research.

The research questions of this article.

1. How do self-directed learning modules for postgraduate academic writing conceptualize and operationalize self-directed learning and self-regulated learning across EFL and Global South higher education contexts from 2020 to 2025?
2. What pedagogical and technological design features characterize self-directed learning modules for postgraduate academic writing, and what enabling conditions are reported?
3. What effects are reported for self-directed learning modules on postgraduate students' academic writing outcomes and on autonomy and self-regulation related outcomes?
4. What implementation challenges and evidence gaps remain in the literature, particularly in Indonesia and comparable EFL and Global South settings?

B. Methods

A systematic literature review was employed to synthesize empirical evidence on the use of self-directed learning modules to support postgraduate students' academic writing in higher education contexts. In line with contemporary guidance on evidence informed reviews, the procedures were structured, transparent, and replicable, and reporting followed the PRISMA 2020 statement.

1. Search Strategy

Electronic searches were conducted across multiple sources to improve coverage and reduce selection bias. The primary databases were Scopus and ERIC. These were complemented by targeted searches in publisher platforms, namely Wiley Online Library, Taylor and Francis Online, and SAGE Journals. In addition, Google Scholar was searched using the Publish or Perish application to improve sensitivity for Indonesian and other regional journals that may not be consistently indexed in curated databases. The search covered publications from January 2020 to October 2025 in order to capture recent developments in self-directed learning based academic writing support for postgraduate students and the expansion of digital and modular learning resources in higher education. Searches combined keywords and Boolean operators representing three concept blocks, namely self-directed learning modules, academic writing, and postgraduate populations. Truncations and spelling variants were adapted to each platform interface. Where relevant, supplementary contextual terms such as Indonesia, EFL, and English for academic purposes were used to refine retrieval without narrowing the core search excessively. Reference lists of included studies were also hand searched to identify additional eligible articles.

Only peer reviewed journal articles were retained. Indexing status such as Scopus quartile or SINTA level was recorded when available, but it was not used as an

exclusion criterion provided that articles met the eligibility criteria and reported sufficient methodological detail. The complete database specific search strings exactly as executed, including searched fields, applied filters, and search run dates, are provided in Appendix A.

2. Eligibility criteria

Inclusion criteria

a. Empirical studies using quantitative, qualitative, or mixed methods designs published as peer reviewed journal articles.
b. Written in English or Indonesian.
c. Published between 2020 and 2025.
d. Context: higher education settings where the participants are postgraduate students, including masters or doctoral programs, and closely related advanced tertiary cohorts undertaking research style academic writing tasks.
e. Pedagogical intervention, course design, or support activity explicitly involving self-directed learning modules, print or digital, online, blended, or self-access, designed to guide students through academic writing development.
f. Writing focused outcomes: courses or interventions targeting academic writing such as thesis or dissertation writing, research proposal writing, research article writing, or scientific writing where writing is a central learning goal and assessed product.
g. Report at least one outcome related to academic writing performance, writing processes, learner autonomy, self-regulation related outcomes, or students' perceptions of self-directed learning modules for academic writing.

Exclusion criteria

a. Conference proceedings, theses or dissertations, book chapters, editorials, and non-peer reviewed reports.
b. Studies focusing on self-directed learning for general study skills or non-writing skills without explicit and substantial attention to academic writing.
c. Articles where self-directed learning is mentioned only as a general orientation but no concrete module with structured units, materials, or tasks is described or implemented.
d. Studies based solely on curriculum documents or theoretical discussion without empirical data on postgraduate or advanced tertiary learners' engagement with modules for academic writing.
e. Articles without accessible full text or without sufficient methodological detail to judge module characteristics and their relation to academic writing outcomes.

All records identified from the databases, publisher platforms, and Google Scholar

were exported, screened for duplicates, and then evaluated in two stages, namely title and abstract screening followed by full text assessment against the eligibility criteria. The identification, screening, eligibility, and inclusion steps are summarized in a PRISMA 2020 flow diagram.

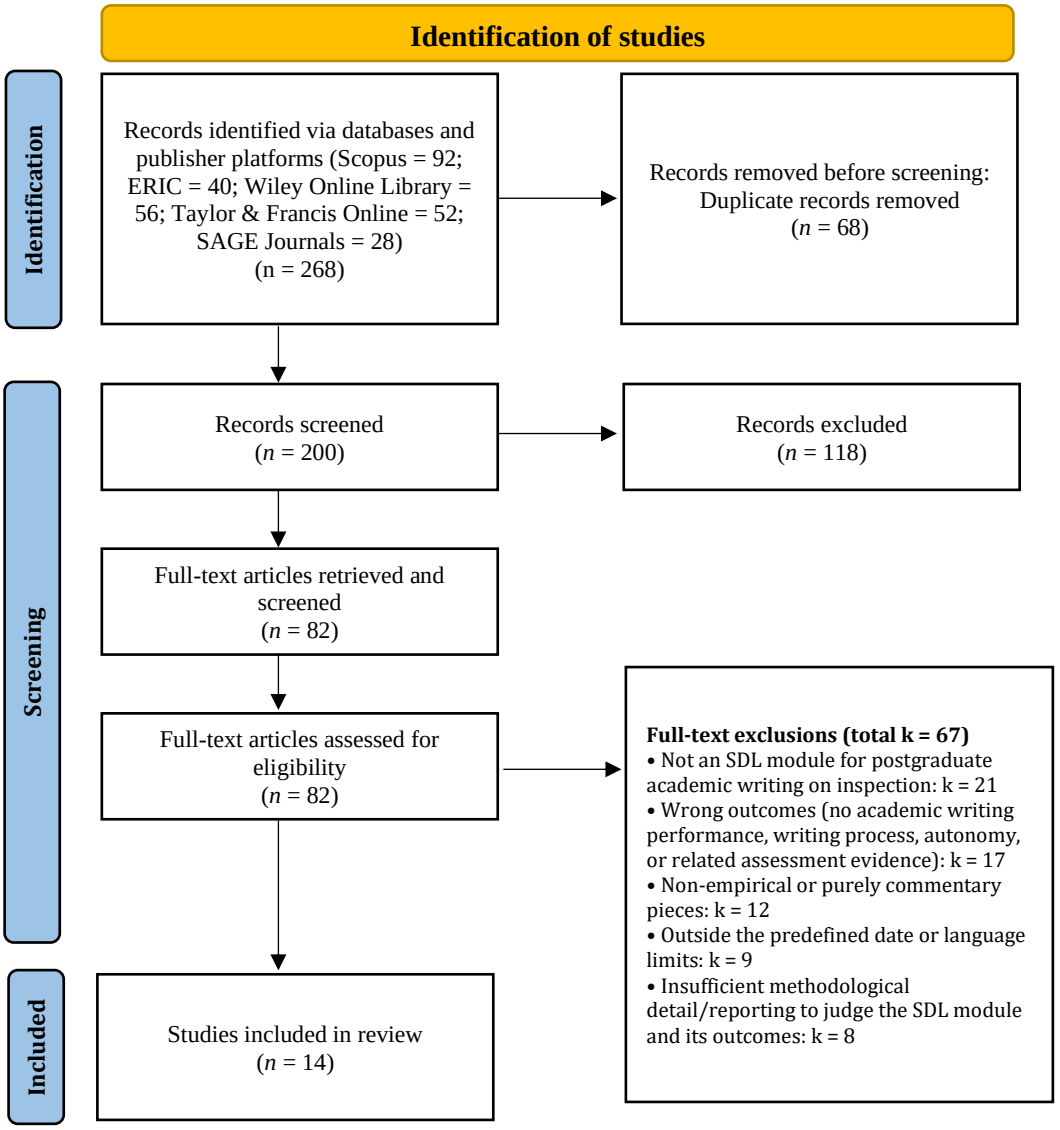

Figure 1. PRISMA flow chart, Moher et al. (2009)

The PRISMA 2020 guided search and screening process identified 20 peer reviewed journal articles that investigated SDL modules or SDL oriented approaches for academic or research style writing in higher education. Among these, 14 studies focused primarily on academic writing ability and are presented in Table 1 as Cluster 1.

C. Results and Discussion

General Findings and Background of the Studies

The PRISMA guided search and screening procedures resulted in 14 peer reviewed journal articles that directly examined self-directed learning modules and self-directed learning-oriented approaches in relation to academic or research style writing in higher education during 2020 to 2025. Most studies were conducted in Asian EFL and ESL contexts, particularly Indonesia, Malaysia, China, and Pakistan, with a smaller number of studies from European universities. Examples include research on Pakistani EFL learners' self-directed learning and academic writing skills (Maryam et al., 2025), Chinese postgraduates engaged in personal learning environment supported group academic writing (Xu et al., 2025), Indonesian university students using technologies for self-directed completion of academic English writing tasks (Pasaribu & Manara, 2024), and a trilingual European university that developed a self-access academic writing centre (Burton et al., 2024).

In terms of participant profile, the majority of studies focused on postgraduate or advanced tertiary level EFL and ESL learners enrolled in thesis writing, academic writing, or research methods courses. Several studies explicitly targeted master's or doctoral students, for example early-stage postgraduates working in a personal learning environment supported group writing context (Xu et al., 2025) and postgraduate students' perceptions of AI based automated self-assessment tools in academic writing (Pratiwi and Yulia, 2025). A smaller subset involved advanced undergraduates in academic writing courses whose tasks such as research reports, argumentative essays, and seminar papers closely resembled postgraduate academic literacy demands. These studies were retained as complementary evidence because the interventions were designed around research style writing and self-directed engagement with writing resources.

Methodologically, quantitative and mixed methods design dominate the corpus. Several studies employed quasi experimental or experimental approaches to compare self-directed learning-oriented instruction with more traditional methods, often measuring gains in academic writing scores and related constructs such as self-efficacy, self-regulation, or critical thinking (for example Maryam et al., 2025; Anggraeni et al., 2024). Others adopted cross sectional survey designs to map students' readiness for self-directed learning in academic writing improvement (Adnan and Sayadi, 2021), their use of technologies to support self-directed academic writing (Pasaribu & Manara, 2024), or their perceptions of specific tools such as Grammarly and AI based self-assessment platforms (Wardatin et al., 2022; Musyarofah et al., 2025; Pratiwi and Yulia, 2025). A smaller group used qualitative case study or action research designs to provide thick descriptions of how learners work with self-access materials, digital tools, and writing centre supports over time.

With respect to the nature of interventions, the corpus shows considerable diversity in how self-directed learning modules are conceptualized and operationalized. Some studies examined structured multi-unit modules or self-access strategy instruction integrated into academic writing courses, for instance self-access strategy instruction for academic writing vocabulary (Wang and Cohen, 2023) and self-regulated learning-based instruction for argumentative writing that explicitly cultivates planning, monitoring, and self-evaluation (Anggraeni et al., 2024). Other studies focused on digital tools and platforms that function as self-directed learning micro modules, such as AI assisted writing tools and automated self-assessment systems that students can access independently to review drafts, monitor progress, and refine texts (Wardatin et al., 2022; Aladini et al., 2025; Musyarofah et al., 2025; Pratiwi and Yulia, 2025). Finally, several studies described institutional infrastructures such as self-access academic writing centres and online self-directed learning platforms that embed modular resources, workshops, and consultations designed to foster sustained self-directed development of academic writing (Burton et al., 2024; Xu et al., 2025). Taken together, this evidence base provides a sufficiently rich platform to synthesize how self-directed learning modules and self-directed learning-oriented environments are designed for postgraduate and advanced academic writing, what types of learning and writing outcomes they are associated with, and which contextual and pedagogical conditions appear to support or hinder their effectiveness.

Table Cluster 1. SDL Oriented Studies with A Primary Focus on Academic Writing Ability (n equals 14)

No.	Author(s) & Year	Context / participants (brief)	SDL focus & main writing-related outcomes (very brief)
1	Maryam et al. (2025)	Pakistani university EFL learners (academic writing course)	Structural-equation model shows SDL positively predicts academic writing skills; critical thinking partially mediates the relationship.
2	Anggraeni et al., 2024	Indonesian EFL students in academic writing/argumentative essay course	Self-regulated learning–based instruction, designed to foster SDL, significantly improves argumentative writing scores and self-efficacy compared with regular instruction.
3	Xu et al. (2025)	Chinese early-stage postgraduate students	PLE-supported group academic writing environment enhances organisation, source integration, and perceived control over the writing process.
4	Wang & Cohen (2023)	University students in an EAP context	Self-access strategy instruction for academic writing vocabulary improves lexical sophistication and strategic vocabulary learning behaviours in writing.
5	Burton et al. (2024)	Trilingual European university (self-access writing centre users)	Self-access academic writing centre with modular resources supports ongoing, self-directed development of academic writing; usage patterns and challenges documented.
6	Wardatin et al.	Indonesian EFL writers	SDL-oriented use of Grammarly increases

	(2022)	using Grammarly	awareness of grammatical issues and encourages iterative revision; students perceive tool as supportive of independent writing.
7	Musyarofah et al. (2025)	Indonesian EFL students in an academic writing course	Strong positive correlation between Grammarly use and SDL dimensions; students with higher SDL report more reflective, autonomous engagement with academic writing tasks.
8	Pratiwi & Yulia (2025)	Postgraduate EFL students in Indonesia	Qualitative study of AI-based automated self-assessment shows perceived gains in grammatical accuracy, cohesion, confidence, and efficiency, alongside challenges in feedback interpretation.
9	Aladini et al. (2025)	Learners engaged in computer/AI-based writing tasks	Self-directed writing development across AI-mediated tasks improves writing scores, grammatical accuracy, and growth-mindset orientations toward writing.
10	Pasaribu & Manara, (2024)	Indonesian university students completing academic English writing tasks	Mixed-methods study mapping technology use for SDL; diverse tools (word processors, corpora, AI) support independent planning, drafting, and revising of academic assignments.
11	Sari & Permana (2025)	Indonesian students in an autonomous learning writing class	SDL strategies (goal-setting, self-evaluation, reflective journaling) embedded in class tasks lead to improved descriptive writing and stronger sense of responsibility for learning.
12	Mujiono (2024)	Indonesian EFL undergraduates (academic writing problem-solving)	Shows that self-efficacy and self-regulated learning mediate the effect of SDL on academic writing problem-solving, highlighting intertwined roles of motivation and regulation.
13	Rizkiani (2023)	Indonesian EFL students in academic writing tasks	Correlational study finds significant positive relationship between SDL and academic writing performance, suggesting that more self-directed learners tackle writing problems more effectively.
14	Studies of institutional SDL platforms (e.g., SAAWR modules, university academic-skills programmes)	Postgraduate and advanced students accessing self-paced academic writing tutorials	Self-access online modules covering introductions, literature reviews, and methods sections support gradual improvement in research-genre writing and allow flexible, self-paced engagement.

Note: Studies 11 to 14 extend the core postgraduate focus by providing complementary evidence on SDL readiness, academic writing problem solving, and institutional module design in closely related tertiary contexts.

Effects of SDL Modules on Academic Writing and Related Outcomes

Across the 14 studies reviewed, self-directed learning modules and self-directed learning-oriented approaches are consistently associated with positive effects on academic writing performance. Intervention, correlational, and mixed methods evidence converges in showing that higher levels of self-directed learning or sustained participation in self-directed learning rich environments are linked to better writing outcomes, particularly when learners engage in iterative cycles of goal setting, drafting, feedback use, and revision.

Maryam et al. (2025) report that self-directed learning positively predicts academic writing skills among Pakistani EFL learners, with critical thinking partially mediating this relationship. Learners with stronger self-directed learning profiles produced more coherent, grammatically accurate, and better organized academic texts. Similarly, Anggraeni et al., (2024), demonstrate that self-regulated learning-based instruction designed to cultivate planning, monitoring, and self-evaluation yields significantly higher argumentative writing scores than regular instruction, especially for students with stronger self-efficacy beliefs.

Studies focusing on specific components of academic writing also highlight tangible benefits. Wang and Cohen (2023) show that self-access strategy instruction for academic writing vocabulary helps learners expand academic lexis and adopt more strategic ways of noticing, recording, and recycling vocabulary in their writing. In Chinese postgraduate contexts, Xu et al. (2025) find that a personal learning environment supported group academic writing environment enhances students' sense of control over the writing process, improves global organization, and strengthens their ability to integrate sources appropriately.

A cluster of studies explores self-directed learning effects through digital tools and AI assisted writing environments. Research on Grammarly suggests that, when framed as a self-directed resource rather than a teacher-controlled mechanism, it can support both surface level accuracy and deeper self-monitoring. Wardatin et al. (2022) report that learners using Grammarly within an SDL oriented writing module increased awareness of recurrent grammatical problems and became more willing to revise. Musyarofah et al. (2025) report a strong positive correlation between Grammarly use and self-directed learning levels among Indonesian EFL students, indicating that productive tool engagement is intertwined with self-management, motivation, and self-monitoring behaviors. AI based automated self-assessment tools are also reported to facilitate more independent and iterative revision cycles. Pratiwi and Yulia (2025), working with postgraduate EFL students, find that learners perceive such tools as helpful for reducing grammatical errors, improving cohesion, and increasing drafting efficiency, while emphasizing that tools are most beneficial when used as prompts for reflection rather than as unquestioned authorities. Complementing these findings,

Aladini et al. (2025) show that self-directed writing development across computer and AI based tasks is associated with improvements in writing scores, grammatical accuracy, and growth mindset orientations. Learners who used AI feedback to set goals and reflect on progress gained more than those who used it mainly for quick corrections.

Beyond product-oriented gains, the corpus documents robust effects on autonomy, confidence, and self-regulatory behaviors. Survey studies indicate that students with higher self-directedness show stronger readiness to assume responsibility for improving their writing skills (Adnan and Sayadi, 2021) and more active use of digital resources, online corpora, and writing aids when completing academic writing tasks (Pasaribu & Manara, 2024). In Indonesian contexts, studies of autonomous writing classrooms suggest that goal setting, self-evaluation checklists, and reflective journals help students sustain writing effort and extend learning beyond formal course requirements (Sari and Permana, 2025). Collectively, these findings support the argument that SDL modules are not only vehicles for improving text quality but also mechanisms for developing the dispositions and habits required for sustained academic literacy in postgraduate education.

Discussion on variations and contradictions in findings

Although the overall trend is positive, the evidence also shows meaningful variations in the magnitude and consistency of effects across tools, sites, and cohorts. These variations suggest that SDL modules and tool mediated supports do not operate as uniform interventions. Their effectiveness depends on how SDL processes are scaffolded, how tools are positioned within assessment and supervision structures, and how learners interpret and act on feedback. In this sense, apparent contradictions should not be interpreted as simple inconsistencies but as signals of moderating conditions that shape when and for whom SDL modules work best.

One clear example concerns grammar and writing support tools such as Grammarly. Some studies report strong associations between Grammarly use and SDL dimensions or perceived writing gains, while other contexts report weaker relationships or more mixed benefits. Several factors may explain these differences. First, the instructional framing of the tool varies. When Grammarly is integrated into a structured SDL module with explicit routines for goal setting, error pattern diagnosis, reflective revision logs, and rubric guided self-evaluation, the tool supports self-monitoring and strategic revision. When learners use Grammarly primarily as a quick correction mechanism without reflective scaffolding, its impact may remain limited to surface editing, producing smaller gains and weaker links to SDL outcomes. Second, access and usage conditions differ. Differences in internet stability, device access, the limits of free versus paid features, and time on task can influence the depth of engagement and the strength of observed relationships. Third, measurement choices matter.

Studies relying on self-report perceptions may yield stronger positive associations than studies using independent writing assessments or longer follow up windows. Finally, learner characteristics such as language proficiency, prior genre knowledge, and feedback literacy moderate whether automated feedback is understood, trusted, and used strategically rather than accepted uncritically.

Beyond tool specific factors, the interplay between culture, institutional support, and SDL effectiveness is a central explanation for variation in EFL and Global South contexts. In settings where academic culture is more lecturer centred and hierarchical, learners may have limited prior experience with autonomous study routines and may expect directive guidance rather than self-initiated planning and monitoring. In such contexts, SDL modules can still be effective, but they tend to require stronger scaffolding that gradually shifts responsibility to learners, for example through guided goal setting, staged independence, and explicit modelling of revision decisions. Conversely, in institutions with stronger writing support infrastructures such as writing centres, peer communities, and structured supervision practices, SDL modules are more likely to become productive extensions of an existing support ecology, enabling learners to sustain self-regulation over longer writing timelines. Alignment also matters. When module activities feed directly into thesis milestones, graded drafts, or supervisor feedback cycles, learners have clearer incentives and clearer criteria for self-evaluation. When modules operate as optional add ons, engagement is often sporadic, making outcomes more sensitive to individual motivation and time constraints.

Taken together, these variations reinforce the theoretical claim that SDL outcomes in postgraduate writing are best understood through an SDL and self-regulated learning lens. Tools and modules support writing development most reliably when they strengthen self-regulation processes such as planning, monitoring, strategy use, and reflection, and when institutions provide conditions that enable sustained practice, high quality feedback, and equitable access. Future research should therefore report more detailed implementation information, including the intended SDL mechanisms, the nature of scaffolding, usage intensity, and the surrounding support ecology, so that differences across findings can be interpreted as context sensitive effects rather than as simple inconsistencies.

Design Features, Challenges, and Enabling Conditions

Beyond documenting outcomes, the reviewed studies provide detailed insights into how self-directed learning modules and self-directed learning-oriented environments are designed, as well as the challenges that arise in practice. One prominent design feature across successful interventions is modularization. Academic writing support is broken down into self-contained units that address specific genres such as research articles, theses, and proposals, rhetorical moves such as framing a research gap and

synthesizing literature, and micro skills such as hedging, citation, and cohesion. Burton et al. (2024), for instance, describe a self-access academic writing centre structured around modular resources, workshops, and online materials that students can navigate flexibly, while still receiving guidance on recommended learning pathways. Wang and Cohen (2023) similarly emphasize that effective self-access strategy instruction depends on clear, sequenced tasks and explicit strategy explanations that learners can revisit independently.

A second feature is the integration of feedback rich digital tools into self-directed learning modules. Studies on Grammarly, AI based automated self-assessment, and AI empowered writing strategies show that these tools are often embedded within broader SDL frameworks, where students are encouraged to use automated feedback to diagnose problems, compare system suggestions with their own intentions, and plan subsequent revisions (Wardatin et al., 2022; Musyarofah et al., 2025; Pratiwi and Yulia, 2025). In some cases, these tools are complemented by human feedback in the form of writing centre consultations, peer review, or supervisor commentary, creating a layered feedback ecology that learners can navigate according to their needs.

Third, several studies foreground explicit support for self-regulation and reflection as central to module design. Anggraeni et al., 2024**,** integrate goal setting activities, self-monitoring checklists, and reflective journals into a self-regulated learning based academic writing course, enabling students to track progress and adjust strategies across multiple writing assignments. Xu et al. (2025) report that in personal learning environment supported group writing, learners document resource use, justify their choice of materials, and reflect on how collaborative drafting influences their understanding of genre conventions, thereby making SDL processes visible and discussable.

Despite these strengths, recurrent challenges are evident. One major issue concerns uneven SDL readiness and digital literacy. Adnan and Sayadi (2021) show that many learners exhibit only moderate levels of self-directedness and are unsure how to initiate SDL without explicit guidance. In AI assisted contexts, Pratiwi and Yulia (2025) identify difficulties such as misinterpretation of automated feedback, feedback overload, dependence on stable internet connections, and over reliance on limited features, all of which can undermine learners' sense of control. Similar concerns about superficial engagement with automated feedback and the risk of using AI mainly for quick correction rather than deep revision are also reported in studies of AI mediated writing activities.

A second set of challenges relates to workload and sustainability. Designing high quality modules, maintaining self-access platforms, and curating digital resources demand substantial time and institutional support. Writing centre staff note the ongoing effort required to update materials, respond to diverse learner needs, and

align self-access offerings with evolving programed requirements (Burton et al., 2024). In some contexts, lecturers express concern that introducing SDL modules may add to workload if modules are not integrated into course structures and assessment schemes.

Finally, several studies warn that SDL modules are not automatically inclusive. Learners with lower proficiency, limited access to devices or internet, or less experience with independent learning may struggle to benefit fully from SDL environments. Pasaribu & Manara, (2024) reports that while many Indonesian EFL students actively use a range of technologies for self-directed writing, others remain dependent on teacher provided materials and struggle to evaluate online resources critically. These findings underscore the need to design SDL modules that incorporate scaffolding for weaker writers, explicit training in digital literacy and academic literacy, and options for differentiated support such as optional tutorials and small group clinics.

Across the corpus, several enabling conditions for effective SDL modules in postgraduate academic writing emerge.

1. Clear modular structure and learning pathways that help students see how units such as literature review, methods, and discussion connect to thesis and article milestones.
2. Integration with assessment and supervision so that module outputs feed directly into graded tasks, draft chapters, or conference papers.
3. Feedback ecologies that combine automated, peer, and expert feedback, supported by explicit guidance on how to interpret and act on different kinds of feedback.
4. Deliberate cultivation of self-regulation through goal setting, progress tracking, reflective writing, and opportunities to discuss strategies with peers and mentors.
5. Institutional support for writing centres and digital infrastructures so that resources remain accessible, updated, and aligned with programme outcomes.

These conditions collectively point toward an educational framework in which SDL modules are not add ons but integrated components of postgraduate academic writing curricula, designed to work in tandem with supervision, coursework, and institutional support services. At the same time, the evidence base reveals gaps that limit strong inference and generalization. Many studies provide limited information about module design rationales, implementation fidelity, and time on task. Experimental, quasi experimental, and longitudinal studies remain relatively scarce, particularly in Indonesian and comparable Global South EFL settings. Addressing these gaps is essential for developing scalable and evidence informed SDL module models that can strengthen postgraduate academic writing across diverse disciplines and institutions.

Taken together, the evidence synthesized in Sections 4.1 to 4.3 indicates that self-directed learning modules for postgraduate academic writing are most productive when they function as curriculum embedded systems that make self-regulation explicit and actionable. Across contexts, effective designs operationalize self-directed learning through mechanisms consistent with Garrison's model, namely task and resource management, self-monitoring, and motivational persistence, while also enacting the cyclical processes described in Zimmerman's self-regulated learning framework through goal setting, strategic drafting, feedback interpretation, and reflective revision routines. At the same time, the review shows that outcomes are shaped by implementation conditions, particularly learners' self-directed learning readiness and digital literacy, the quality and layering of feedback sources, and the degree of integration with supervision and assessment. Persistent gaps in methodological rigor, reporting of implementation fidelity, and longitudinal evidence, especially in Indonesian and comparable Global South EFL settings, further underscore the need for a design and evaluation framework that is both theoretically grounded and practically scalable. Therefore, drawing directly on the convergent design features, enabling conditions, constraints, and gaps identified across the corpus, the next section proposes an educational framework for self-directed learning modules in postgraduate academic writing that aligns intended writing and self-regulation outcomes with modular learning sequences, feedback ecology, institutional supports, and evaluative indicators to guide curriculum development, implementation, and future research.

D. Conclusions

This systematic review synthesized empirical evidence on the use of self-directed learning modules and self-directed learning-oriented approaches to support academic and research style writing in higher education, with a particular emphasis on postgraduate and advanced EFL and ESL learners. The PRISMA guided process identified 20 peer reviewed journal articles, of which 14 studies focused primarily on academic writing ability. Overall, the evidence indicates that engagement with well-structured SDL provision is associated with improvements in key dimensions of academic writing, including content development, organization, lexical control, and grammatical accuracy, alongside gains in autonomy, confidence, and self-regulatory capacity. These findings support the view that SDL is not only a learner disposition but also a design principle that can be operationalized through modular learning pathways, explicit regulation supports, and feedback rich learning environments.

A central implication of this review is the need to distinguish and compare SDL module design types. Strategy based designs that explicitly teach planning, monitoring, goal setting, and reflective revision appear to strengthen learners' capacity to manage complex writing tasks and to transfer writing strategies across genres and milestones. Tool based designs, including writing support platforms such

as Grammarly and AI based automated self-assessment, can function as SDL micro modules by accelerating error noticing and revision cycles and by supporting self-monitoring. However, tool effects are likely to vary across contexts depending on feedback literacy, access conditions, and instructional framing. Tools tend to be more beneficial when integrated into structured SDL routines that require learners to interpret feedback critically, justify revision decisions, and connect tool use to clear criteria and authentic writing products. Therefore, the most robust pathway suggested by the corpus is not tool use alone, but hybrid designs in which digital tools are embedded within strategy focused modules that make self-regulation visible and actionable.

The review also shows that SDL effectiveness is shaped by cultural and institutional conditions. In contexts where academic culture is more lecturer centred and hierarchical, learners may have limited experience with independent learning routines and may require stronger scaffolding and staged release of responsibility. In institutions with stronger writing support ecologies, such as writing centres, coherent supervision practices, peer communities, and assessment alignment, SDL modules are more likely to become sustained supports rather than optional add ons. These findings underline that SDL based writing support is not a plug and play solution. It requires institutional investment in accessible digital infrastructures, curriculum integration, and professional development for lecturers and supervisors to strengthen students' self-regulation, feedback literacy, and responsible tool use.

Several limitations should be acknowledged. Although the review followed PRISMA 2020 reporting guidance and incorporated multiple information sources, the evidence base remains dominated by Asian settings, particularly Indonesia, with fewer studies from other regions. The heterogeneity of interventions, contexts, and outcome measures limited the feasibility of meta-analysis. In addition, while the focus of the review is postgraduate writing, a subset of included studies involved advanced undergraduates undertaking research style writing tasks comparable to postgraduate demands, which may affect generalizability to exclusively postgraduate cohorts.

Future research should address three priorities highlighted by the current evidence. First, studies should compare SDL module designs more systematically, especially strategy based versus tool based and hybrid configurations, with clearer reporting of design rationales, scaffolding mechanisms, and implementation fidelity. Second, research should investigate long term impact on publication related outcomes that matter in postgraduate education, including thesis completion timelines, manuscript submission and acceptance rates, revision quality across cycles, and sustained writing productivity over programs. Third, disciplinary differences should be examined explicitly, because the rhetorical goals, evidence conventions, and collaboration practices of STEM fields differ substantially from those in the humanities and social sciences. Comparative work across disciplines and institutions, supported by

longitudinal designs, would strengthen causal inference and produce practical guidance for scalable module adoption. By addressing these directions, future scholarship can help universities use SDL modules not merely as remedial supplements but as curriculum embedded infrastructures for sustainable academic literacy and research writing competence.

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Appendix A. Search strings and filters

This appendix reports the database and platform specific search strings exactly as executed, including fields searched, applied filters, optional terms, and the date each search was run.

A1. Scopus

Date searched: 31 October 2025
Search mode: Advanced search
Fields: TITLE ABS KEY
Filters applied: publication years 2020 to 2025; document type article; source type journal; language English and Indonesian where available
Exact search string:
TITLE ABS KEY ("self-directed learning" OR SDL OR "self-access module*" OR "independent learning module*" OR "self-paced module*" OR "self-access learning")
AND TITLE ABS KEY ("academic writing" OR "research writing" OR "thesis writing" OR "dissertation writing" OR "research article writing" OR "scientific writing")
AND TITLE ABS KEY (postgraduate OR "postgraduate student*" OR "graduate student*" OR "master* student*" OR "masters student*" OR "doctoral student*" OR "PhD student*")

A2. ERIC

Date searched: 31 October 2025
Search mode: Advanced search
Fields: All fields
Filters applied: peer reviewed only; publication date 2020 to 2025; education level higher education where available; language English
Exact search string:
("self-directed learning" OR SDL OR "self-access module*" OR "independent learning module*" OR "self-paced module*" OR "self-access learning")
AND ("academic writing" OR "research writing" OR "thesis writing" OR "dissertation writing" OR "research article writing" OR "scientific writing")
AND (postgraduate OR "postgraduate student*" OR "graduate student*" OR "master* student*" OR "masters student*" OR "doctoral student*" OR "PhD student*")

A3. Wiley Online Library

Date searched: 31 October 2025
Fields: Anywhere in article content
Filters applied: publication years 2020 to 2025; journals only where available; article content type where available
Exact search string:
("self-directed learning" OR SDL OR "self-access module*" OR "self-paced module*")

AND ("academic writing" OR "research writing" OR "thesis writing" OR "dissertation writing" OR "research article writing")

A4. Taylor and Francis Online
Date searched: 31 October 2025
Fields: All fields
Filters applied: publication years 2020 to 2025; journals only where available; article type research article where available
Exact search string:
("self-directed learning" OR SDL OR "self-access module*" OR "self-paced module*")
AND ("academic writing" OR "research writing" OR "thesis writing" OR "dissertation writing" OR "research article writing")
A5. SAGE Journals
Date searched: 31 October 2025
Fields: All fields
Filters applied: publication years 2020 to 2025; research article where available
Exact search string:
("self-directed learning" OR SDL OR "self-access module*" OR "self-paced module*")
AND ("academic writing" OR "research writing" OR "thesis writing" OR "dissertation writing" OR "research article writing")

A6. Google Scholar via Publish or Perish
Date searched: 31 October 2025
Query type: Google Scholar keywords search
Publish or Perish settings: years 2020 to 2025; maximum results 200; sorting relevance default
Exact search string:
"self-directed learning" OR SDL OR "self-access module" OR "independent learning module" OR "self-paced module" OR "self-access learning"
AND "academic writing" OR "research writing" OR "thesis writing" OR "dissertation writing" OR "research article writing" OR "scientific writing"
AND postgraduate OR "postgraduate student" OR "graduate student" OR "master student" OR "doctoral student" OR "PhD student"

A7. Supplementary contextual searches
Date searched: 31 October 2025
Optional contextual terms used: Indonesia, EFL, ESL, English for academic purposes, EAP
Exact supplementary string applied:
(core search string)
AND (Indonesia OR EFL OR ESL OR "English for academic purposes" OR EAP)