

Digital Heutagogy in Developing Malay Language Academic Writing Skills among Postgraduate Students: A Conceptual Model

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ABSTRACT

The advancement of digital technologies, most recently generative artificial intelligence, has reshaped how postgraduate students acquire, negotiate, and produce academic knowledge. Yet the development of academic writing skills in the Malay language (Bahasa Melayu) at the postgraduate level remains largely anchored in instructor-directed pedagogical practices that are poorly aligned with the maturity, autonomy, and professional realities of adult learners. This conceptual paper proposes a model of digital heutagogy for developing Malay language academic writing capability among postgraduate students in higher education institutions. Drawing on heutagogy (self-determined learning) as the primary lens, and integrating self-determination theory, self-regulated learning, sociocultural theory, and the cognitive process theory of writing, the paper synthesises literature on the pedagogy–andragogy–heutagogy (PAH) continuum, digital heutagogic design, and technology-mediated writing development. The proposed Digital Heutagogy for Malay Academic Writing (DH-MAW) model comprises five interrelated components: (1) learner agency as an antecedent condition; (2) a digital learning ecosystem as an enabling environment; (3) a six-element digital heutagogic process of exploring, creating, collaborating, connecting, sharing, and reflecting organised around learner-defined writing contracts; (4) graduated scaffolding and feedback, including artificial intelligence-mediated formative feedback; and (5) capability outcomes achieved through double-loop learning. Nine theoretical propositions are advanced, each specifying whether the relationship concerned is direct, mediating, or moderating, and each stated in a form that permits estimation and refutation. The paper further establishes why an adaptation of an English-language academic writing framework would be inadequate, by setting out the diglossic register system of Bahasa Melayu, its centrally gazetted terminology regime, its affix-driven nominalisation of scholarly register, and the absence of the corpus and genre infrastructure that English for academic purposes takes for granted. A dedicated implementation section addresses the conditions under which the model could operate in Malaysian higher education institutions: institutional and assessment-policy barriers, the structure and fair assessment of learner-defined writing contracts within existing thesis regulations, supervisor development needs, an explicit ethical protocol governing generative AI use in Malay academic writing, an institutional readiness audit with a three-semester phased rollout, a minimum-viable configuration for institutions with constrained infrastructure or students with uneven digital literacy, adaptations for learners of differing Malay proficiency, and a companion implementation checklist for practitioners. The model contributes to the underexplored intersection of heutagogy, national language education, and educational technology, and offers actionable guidance for curriculum designers, supervisors, graduate schools, and policymakers committed to strengthening scholarly writing in the Malay language.

Keywords: heutagogy; self-determined learning; academic writing; Malay language; postgraduate education; educational technology; generative artificial intelligence

INTRODUCTION

Academic writing is the principal vehicle through which postgraduate students demonstrate disciplinary

mastery, construct scholarly identity, and contribute to the knowledge economy. It is simultaneously one of the most cognitively demanding literacies in higher education, requiring the orchestration of planning, translating ideas into text, and reviewing within socially sanctioned rhetorical conventions (Flower & Hayes, 1981; Hyland, 2013). For postgraduate students in Malaysian higher education institutions, this challenge acquires an additional dimension: a substantial proportion of theses, dissertations, project papers, and journal manuscripts in the humanities, social sciences, education, and Malay studies must be produced in Bahasa Melayu, the national language and a designated language of knowledge. Institutional style guides such as the Gaya UKM thesis writing manual codify the conventions of Malay scholarly discourse and signal the continuing institutional commitment to the language as a medium of advanced scholarship (Universiti Kebangsaan Malaysia, 2015).

At the same time, the landscape of learning itself has shifted. The Malaysia Education Blueprint 2015–2025 (Higher Education) explicitly calls for a transformation from teacher-centred instruction towards learning models that produce autonomous, lifelong learners equipped for volatile and technology-rich futures (Ministry of Education Malaysia, 2015). Within this policy discourse, heutagogy, or the study of self-determined learning, has attracted growing attention in Malaysian higher education as an approach in which learners, rather than instructors, determine what to learn, how to learn it, and how learning should be assessed (Hase & Kenyon, 2000; Tiew & Abdullah, 2021). Heutagogy repositions the adult learner as the primary agent of the learning enterprise and views capability, the capacity to apply competencies in novel and unfamiliar situations, as the goal of education (Blaschke, 2012; Hase & Kenyon, 2007).

The rise of digital technologies has made heutagogic designs newly feasible at scale. Learning management systems, e-portfolios, social media, mobile applications, and, most recently, generative artificial intelligence (GenAI) writing partners provide the connectivity, immediacy, and personalisation that self-determined learning presupposes (Blaschke, 2021; Blaschke & Hase, 2019; Narayan et al., 2019). Scholars have argued that the affordances of digital media networks and heutagogy are mutually reinforcing technology grants learners' control over the place, pace, and path of learning, while heutagogy supplies the theoretical rationale for exploiting that control productively (Blaschke & Hase, 2016; Hamdan et al., 2021). The arrival of large language models has intensified this convergence, offered learners on-demand explanation, feedback, and dialogic rehearsal, while raising legitimate concerns about integrity, over-reliance, and the erosion of authorial voice (Barrot, 2023; Kasneci et al., 2023; Warschauer et al., 2023).

Despite these developments, three gaps motivate the present paper. First, research on heutagogy in Malaysia has concentrated on general teaching and learning practices, mobile heutagogy, and inclusive education, with little attention to language education and virtually none to academic writing in the Malay language (Alias et al., 2019; Hamdan et al., 2021; Kamrozzaman et al., 2019, 2020; Tiew & Abdullah, 2021), although heutagogic work on language learning generally, and on school-level Malay language classrooms, has recently begun to emerge (Kamrozzaman, 2025; Kamrozzaman & Liew, 2025; Musa & Mahamod, 2025). Second, scholarship on technology-mediated academic writing development is overwhelmingly situated in English as a second or foreign language contexts (Barrot, 2023; Kohnke et al., 2023; Warschauer et al., 2023), leaving national and regional languages of scholarship underexamined. Third, although heutagogy is repeatedly described as especially suited to mature, postgraduate learners (Abdullah et al., 2025; Blaschke, 2012), few studies articulate a coherent conceptual model that specifies how heutagogic principles, digital affordances, and the cognitive and social demands of academic writing interact for this population. This paper addresses these gaps by proposing the Digital Heutagogy for Malay Academic Writing (DH-MAW) model, a conceptual framework for developing Malay language academic writing capability among postgraduate students.

The remainder of the paper proceeds as follows. Section 2 states the problem and objectives. Section 3 reviews the literature on the pedagogy–andragogy–heutagogy continuum, digital heutagogy, Malay academic writing, and technology-mediated writing development. Section 4 outlines the theoretical underpinnings of the model. Section 5 presents the DH-MAW model and its propositions. Section 6 addresses implementation in Malaysian higher education institutions, covering institutional barriers, the structure and assessment of writing contracts, supervisor development, ethical generative AI protocols, readiness assessment and phased rollout, low-

resource adaptation, proficiency differentiation, and a practitioner checklist. Section 7 discusses theoretical and policy implications, and Section 8 acknowledges limitations and charts directions for future research.

Problem Statement and Objectives

Postgraduate students are adult learners who typically juggle employment, family, and study, and who bring substantial prior knowledge and intrinsic purpose to their programmes. Paradoxically, the development of their academic writing, particularly in Bahasa Melayu, often remains organised around instructor-directed formats: one-off academic writing workshops, generic style briefings, and corrective supervisory feedback delivered late in the drafting cycle. Such arrangements reflect what Knowles (1980) called a pedagogical rather than an andragogical assumption set, and they sit even further from heutagogy, in which learners negotiate the curriculum, define their own learning contracts, and are assessed in ways they help to design (Blaschke & Hase, 2016; Hase & Kenyon, 2013). The mismatch matters: recent Malaysian evidence indicates that heutagogical activities significantly support postgraduate students' self-determined learning when their psychological needs for autonomy, competence, and relatedness are met (Abdullah et al., 2025), and that Malaysian universities still face structural and cultural challenges in embedding heutagogic practice (Tiew & Abdullah, 2021).

Meanwhile, the writing environment has been transformed by digital tools that students already use, often without institutional guidance. GenAI applications can brainstorm, outline, paraphrase, and give instant feedback, capabilities that can either accelerate the development of self-determined writers or hollow out the very cognitive processes that writing is meant to exercise (Barrot, 2023; Chan & Hu, 2023; Rospigliosi, 2023). For Malay academic writing the stakes are distinctive: learners must manage register and formality in the national language, deploy standardised terminology (*istilah*) curated by language authorities, and uphold the rhetorical conventions of Malay scholarly discourse, tasks for which mainstream, English-optimised tools offer uneven support. There is currently no conceptual framework that integrates heutagogic principles, digital affordances, and the specific demands of Malay academic writing at the postgraduate level.

Accordingly, this conceptual paper pursues three objectives: (1) to synthesise the literature on heutagogy, digital learning, and academic writing development relevant to postgraduate Malay language contexts; (2) to propose a conceptual model, DH-MAW, that specifies the components, processes, and outcomes of digitally mediated, self-determined development of Malay academic writing capability; (3) to derive theoretical propositions, differentiated by relationship type, that can guide subsequent empirical validation of the model; (4) to establish, through an account of the distinctive features of Malay scholarly discourse, why a context-specific model is required rather than an adaptation of an English-language writing framework; and (5) to specify the institutional, regulatory, technological, and linguistic conditions under which the model could be implemented in Malaysian higher education institutions, including a phased rollout and a practitioner checklist.

LITERATURE REVIEW

From Pedagogy to Heutagogy: The PAH Continuum

Heutagogy was introduced by Hase and Kenyon (2000) as an extension of andragogy, itself Knowles' (1980) reformulation of adult learning in contrast to child-oriented pedagogy. Where pedagogy positions the instructor as the arbiter of what and how to learn, and andragogy grants the learner control over the how while goals are often jointly set, heutagogy transfers control over the what, the how, and, crucially, the why of learning to the learner (Blaschke, 2012). Learning is understood as a nonlinear, emergent process consistent with complexity theory, in which learners may exceed and reroute the curriculum designed for them (Hase & Kenyon, 2007). Two constructs distinguish heutagogy from its predecessors. The first is capability: beyond demonstrating competency in known conditions, capable learners can apply skills in unfamiliar, changing situations, a quality of central importance to researchers who must write across evolving genres, audiences, and technologies (Hase & Kenyon, 2013). The second is double-loop learning, in which learners interrogate not only whether their actions solved a problem but also the beliefs and values underlying those actions

(Blaschke, 2012). For writing development, double-loop learning means revising not merely the draft but one's conception of oneself as a Malay-language scholar.

These three approaches are best understood as a continuum, commonly termed the PAH continuum, along which instructor control recedes as learner maturity and autonomy grow (Blaschke, 2012; Moore, 2020). Figure 1 depicts this progression. The continuum framing is pedagogically consequential: it implies that heutagogy does not abolish teaching but re-sequences it, with instructors progressively relinquishing control as learners demonstrate readiness (Glassner & Back, 2020; Stoten, 2020). Postgraduate students, as mature adults engaged in self-motivated research, are widely regarded as the population for whom the heutagogic end of the continuum is most appropriate (Abdullah et al., 2025; Blaschke, 2012).

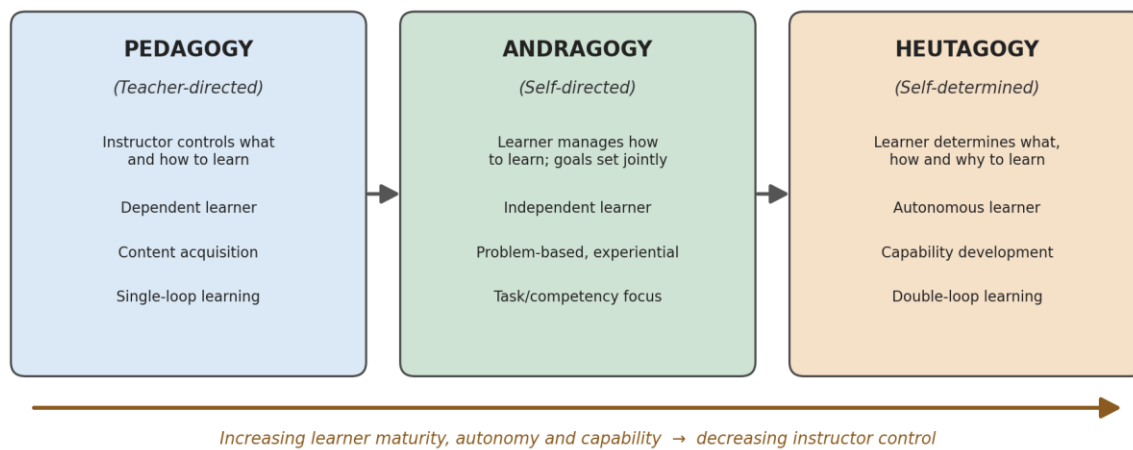


Figure 1. The pedagogy–andragogy–heutagogy (PAH) continuum (adapted from Blaschke, 2012; Hase & Kenyon, 2000)

Digital Heutagogy: Principles and Design Elements

Heutagogy's second life has been decisively digital. Blaschke and Hase (2016) argue that Web 2.0 and social media affordances, including connectivity with others, information discovery and sharing, and content creation, are natural companions to self-determined learning, and they articulate design elements that have become the operational core of digital heutagogy: explore, create, collaborate, connect, share, and reflect. Subsequent design-based research has translated these elements into actionable principles for technology-mediated courses, including learner-defined learning contracts, flexible curriculum, learner-directed questions, flexible and negotiated assessment, and the use of mobile and social media tools to support learner-generated content and contexts (Narayan et al., 2019). Reviews of the field confirm both growing adoption and persistent conceptual looseness and call for models that specify how heutagogic elements are configured in particular domains (Agonaćs & Matos, 2019; Moore, 2020).

In Malaysian higher education specifically, systematic reviews document the uptake of heutagogic practice across institutions, driven by national policy instruments, while noting challenges of assessment rigidity, staff readiness, and student unfamiliarity with autonomy (Tiew & Abdullah, 2021). Mobile heutagogy (m-heutagogy) has been shown to be broadly accepted by higher education students when supported by emergent technologies (Hamdan et al., 2021), and technology-supported heutagogic environments have been modelled even for learners with special educational needs (Alias et al., 2019). A sustained Malaysian research programme by Kamrozzaman and colleagues is particularly instructive for the present paper: an m-learning application of heutagogy was shown to be effective for lifelong learners enrolled in a university academic writing course (Kamrozzaman et al., 2019); a fuzzy Delphi-validated framework subsequently confirmed the six heutagogic elements of exploring, creating, connecting, sharing, reflecting, and collaborating as the design core of heutagogic m-learning (Kamrozzaman et al., 2020); and this line of work has recently been extended into an expert-validated framework specifying how artificial intelligence functionalities can support each

process of self-determined language learning in mobile contexts (Kamrozzaman, 2025). Most recently, Abdullah et al. (2025) provide empirical evidence that heutagogical activities predict self-determined learning among Malaysian postgraduate students, mediated by basic psychological needs, reinforcing the theoretical pairing of heutagogy with self-determination theory adopted in this paper. In the language domain, a systematic review of 33 studies confirms that heutagogical approaches enhance learner autonomy and outcomes in language acquisition contexts (Kamrozzaman & Liew, 2025), and recent survey evidence shows heutagogical practices beginning to take root even in primary school Malay language classrooms (Musa & Mahamod, 2025). What remains missing from this national literature is the application of digital heutagogy to advanced Malay literacy, specifically academic writing at the postgraduate level.

Malay Language Academic Writing at the Postgraduate Level

Academic writing at the postgraduate level is not a generic skill but an induction into disciplinary discourse communities, with their characteristic genres, citation practices, stance markers, and rhetorical moves (Hyland, 2013). Writing in Bahasa Melayu adds language-specific demands: control of formal register (*bahasa baku*) as distinct from colloquial varieties; accurate use of standardised terminology developed and curated by Dewan Bahasa dan Pustaka, accessible through digital reference infrastructures such as the Pusat Rujukan Persuratan Melayu; discourse-level cohesion through Malay discourse markers and grammatical linkage; and adherence to institutional thesis conventions codified in manuals such as *Gaya UKM* (Universiti Kebangsaan Malaysia, 2015). Malaysian studies of student writing repeatedly identify weaknesses in cohesion, discourse marker use, and sustained argumentation in Malay compositions, and lecturers report inconsistencies in assessing Malay academic writing in the absence of shared rubrics, indicating that the teaching and assessment infrastructure for Malay scholarly writing is still consolidating. Encouragingly, heutagogical dispositions in Malay language learning, such as strategy selection, self-assessment of weaknesses, and post-lesson reflection, are already observable among Malaysian pupils, although proactive, self-initiated learning remains weak (Musa & Mahamod, 2025); this reinforces the argument that self-determination must be deliberately cultivated, rather than assumed, when learners reach the postgraduate level.

Two features of this context argue for a heutagogic response. First, postgraduate writers differ enormously in their starting points, needs, and disciplinary targets; a self-determined design allows each writer to define a personally relevant writing agenda, for example mastering the methodology chapter genre, or developing terminological precision in an emerging field, rather than marching through a uniform syllabus. Second, scholarly writing is inherently a long-horizon, self-managed practice: theses and articles are written largely outside class, over months, under the writer's own regulation. An approach that explicitly cultivates self-determination, rather than assuming it, is therefore better matched to the task environment than episodic, instructor-directed interventions (Blaschke & Hase, 2019; Zimmerman, 2002).

Why an English-Language Writing Framework Cannot Simply Be Adapted

It might be objected that the model proposed here is an adaptation of English-language academic writing pedagogy with Malay substituted for English, and that a context-specific framework is therefore unnecessary. The objection deserves a direct answer, because if it were sound the contribution of this paper would be modest. The answer is that Malay scholarly writing differs from English academic writing not only in surface form but in the structure of the problem it poses to the writer, and in the infrastructure available to support its solution.

Seven differences are consequential for design, and they are set out in Table 1. Three deserve emphasis here. The first is diglossia. The separation between *bahasa baku* and colloquial Malay is categorical rather than gradient in the way that formality in English is gradient (Ferguson, 1959), which means that a postgraduate writer whose everyday Malay is fluent may nonetheless lack productive command of the scholarly variety; fluency is not a proxy for register control, and a framework that assumes otherwise will misdiagnose the difficulty. The second is terminological governance. Malay scholarly terminology is gazetted by Dewan Bahasa dan Pustaka and made available through the Pusat Rujukan Persuratan Melayu, so that the writer's task is one of authorised retrieval rather than conventional usage (Dewan Bahasa dan Pustaka, n.d.). No English-language writing framework contains an equivalent obligation, and none therefore specifies a

verification step against a national language authority. The third is infrastructural asymmetry. English for academic purposes rests on decades of genre and stance description (Swales, 1990; Hyland, 2005) and on graded academic vocabulary resources (Coxhead, 2000); Malay academic writing has institutional style manuals but not this descriptive base. A model for Malay cannot draw on that base and must instead put the learner to work generating a local substitute for it, which is precisely what the exploration and creation elements of the heutagogic cycle are asked to do in this design.

Table 1. Distinctive features of Malay academic writing, contrasted with English for academic purposes, and their implications for model design

Feature	Characteristic of Malay academic writing	Contrast with English for academic purposes	Implication for the DH-MAW model
Register and diglossia	Bahasa Melayu operates a marked separation between bahasa baku, used for formal and scholarly purposes, and the colloquial varieties of daily use, a separation closer to classical diglossia than to the stylistic continuum of English (Ferguson, 1959).	English academic writing pedagogy treats formality as a gradient of lexical and syntactic choice within a single variety.	Register control cannot be taught as tone adjustment. The model treats formal-register transformation as a distinct contract-eligible learning goal with its own evidence base.
Terminology standardisation	Scholarly terminology (istilah) is developed and gazetted by Dewan Bahasa dan Pustaka and published through the Pusat Rujukan Persuratan Melayu, so that the writer is obliged to locate and use an authorised term rather than to coin or borrow one (Dewan Bahasa dan Pustaka, n.d.).	English has no central prescriptive terminological authority; disciplinary usage is settled by convention and by peer review.	The digital ecosystem must include an authoritative terminology layer, and verification against it becomes a non-optional step in the writing cycle rather than an optional lookup.
Morphology and nominalisation	Scholarly register in Malay is carried substantially by derivational affixation, including the peN-, meN-, pe...-an and ke...-an patterns that generate the nominalised abstractions characteristic of academic prose.	English academic register relies more on Latinate lexis and nominal groups than on productive morphology.	Instruction and feedback must target affixation systematically. Generic grammar checkers optimised for English do not identify affixation errors that alter meaning or register.
Genre and rhetorical convention	Rhetorical organisation in Malay scholarly writing is codified principally through institutional thesis manuals such as Gaya UKM rather than through a research literature on moves and stance (Universiti Kebangsaan Malaysia, 2015).	English for academic purposes has an extensive descriptive base for genre moves and for stance and engagement (Swales, 1990; Hyland, 2005).	The model cannot assume a shared analytic vocabulary for Malay genre. It positions the exploration element as corpus and exemplar analysis undertaken by the writer, generating the description that the literature does not yet supply.
Lexical and corpus infrastructure	No widely adopted Malay equivalent of an academic word list or of large annotated academic corpora is available to guide vocabulary selection at postgraduate level.	English writers have graded academic vocabulary resources and large reference corpora (Coxhead, 2000).	Learner-built terminology glossaries become a core artefact of the model rather than an accessory, and are treated as legitimate negotiated assessment evidence.

Generative AI performance	Large language models are trained on markedly less formal Malay scholarly text than English, and are correspondingly less reliable for gazetted terminology and for sustained bahasa baku register.	GenAI performs comparatively well on English academic register and can be used with lighter verification.	AI-mediated feedback must be routed through mandatory verification against authoritative Malay references, a requirement formalised in the ethical protocol in Section 6.4.
Assessment infrastructure	Malaysian lecturers report inconsistency in assessing Malay academic writing in the absence of shared rubrics, and postgraduate regulations are framed around conventional chapter submission (Malaysian Qualifications Agency, 2017).	English-medium programmes commonly draw on established rubrics and writing-centre provision.	Negotiated assessment requires a common capability rubric to be supplied by the model, since it cannot be borrowed from existing practice. This is developed in Section 6.2.

Taken together, these features establish that the design problem is not translation but reconstruction. A Malay-specific model must make terminology verification a required step rather than an optional resource, must treat register transformation as a discrete learning object rather than a matter of style, must compensate for the absence of a descriptive genre literature by assigning corpus work to the learner, and must assume weaker rather than stronger generative AI performance. None of these design commitments would follow from adapting an English framework, and each of them shapes the components elaborated in Section 5.

Digital Technologies and Generative AI in Academic Writing Development

A mature body of work establishes that digital environments can support writing development through communities of inquiry, dialogic feedback, and iterative drafting (Garrison et al., 2000; Hattie & Timperley, 2007). Feedback research has shifted from transmission models towards sustainable feedback, in which learners actively seek, generate, and act on feedback information, a stance highly congruent with heutagogy (Boud & Molloy, 2013). Systematic reviews of artificial intelligence in higher education trace a rapid expansion of intelligent tutoring, profiling, and assessment applications, while warning that pedagogical theory has lagged behind technical capability (Zawacki-Richter et al., 2019). More recent meta-level syntheses reiterate this concern, calling for greater ethical rigour and stronger theoretical grounding in AI-in-education research (Bond et al., 2024), and systematic reviews of instructional design similarly report that learning gains from AI integration depend heavily on pedagogically principled design rather than on tool deployment alone (Weng et al., 2024).

Generative AI has sharpened both the promise and the peril. For language learning and writing, GenAI can serve as a tireless interlocutor for brainstorming, outlining, register transformation, and formative feedback (Kohnke et al., 2023; Rospigliosi, 2023). Empirical and analytical work on second language writers documents affordances, such as lowering affective barriers and providing immediate lexical and organisational suggestions, alongside contradictions, including over-reliance, homogenisation of voice, and integrity risks (Barrot, 2023; Warschauer et al., 2023). Students themselves report valuing GenAI for personalised support while worrying about accuracy, ethics, and skill atrophy (Chan & Hu, 2023; Johnston et al., 2024), and reviews of the first waves of GenAI scholarship caution that many early claims about its impact on higher education remain under-evidenced (Jensen et al., 2024). Studies of authentic student–AI interaction further reveal distinct human–AI collaboration patterns in academic writing, ranging from AI-dependent drafting to writer-led, AI-consulted composing, with markedly different implications for learning (Nguyen et al., 2024), while academics' own adoption of GenAI remains uneven and shaped by perceived usefulness and institutional signals (Nikolic et al., 2024). Kasneci et al. (2023) conclude that the educational value of large language models depends on deliberate instructional framing, digital literacy, and assessment redesign rather than on the tools themselves. Two implications follow for the present model. First, GenAI should be positioned within a theory of learner agency, precisely what heutagogy supplies, so that the technology augments rather than substitutes for the writer's self-determined development. Second, for Malay academic writing, GenAI use must

be coupled with authoritative Malay language resources and human scholarly judgement, since large language models remain less reliable for standardised Malay terminology and scholarly register than for English.

Theoretical Underpinnings

Heutagogy as the Primary Lens

The DH-MAW model takes heutagogy as its architectural theory. Heutagogy supplies four commitments that structure the model: (1) the learner determines the learning agenda, including its purposes; (2) learning is nonlinear and emergent, so design must accommodate individual pathways rather than fixed sequences (Hase & Kenyon, 2007); (3) the goal is capability, the transferable capacity to write effectively in novel scholarly situations, not merely competency on rehearsed tasks (Hase & Kenyon, 2013); and (4) development proceeds through double-loop learning, in which the writer's beliefs, values, and scholarly identity are themselves objects of revision (Blaschke, 2012). Digital heutagogy further contributes to the six design elements, exploring, creating, collaborating, connecting, sharing, and reflecting, that operationalise self-determined learning in technology-rich environments (Blaschke & Hase, 2016, 2019).

Self-Determination Theory

Self-determination theory (SDT) explains the motivational engine of heutagogic learning. SDT holds that intrinsic motivation and well-internalised self-regulation flourish when three basic psychological needs are satisfied: autonomy, competence, and relatedness (Deci & Ryan, 2000). Heutagogic designs are, in effect, need-supportive environments: learner-defined contracts satisfy autonomy; graduated challenge and formative feedback build competence; and collaborative, networked learning supplies relatedness. Recent Malaysian evidence confirms that psychological need satisfaction mediates the effect of heutagogical activities on postgraduate students' self-determined learning (Abdullah et al., 2025), justifying SDT's place in the model as the explanatory link between environment and engagement.

Self-Regulated Learning and Social Cognitive Theory

If SDT explains why learners engage, self-regulated learning (SRL) explains how they manage sustained writing projects. SRL describes cyclical phases of forethought, performance, and self-reflection through which learners set goals, deploy strategies, monitor progress, and adapt (Zimmerman, 2002). Underpinning SRL is social cognitive theory's construct of self-efficacy, the writer's belief in their capacity to execute writing tasks, which predicts persistence in the face of the setbacks endemic to thesis writing (Bandura, 1997). In the DH-MAW model, SRL constructs populate the learner agency component and are strengthened, rather than presupposed, by the heutagogic process.

Sociocultural Theory and the Cognitive Process Theory of Writing

Two further theories address the object of learning, writing itself. Sociocultural theory frames writing development as mediated participation: learners appropriate the tools of scholarly Malay, its genres, terminology, and discursive norms, through interaction within a community and within their zone of proximal development, supported by more capable others and by cultural artefacts, which today include digital and AI tools (Lantolf & Thorne, 2006; Vygotsky, 1978). This warrants the model's insistence on scaffolding and community even within a self-determined design. Complementarily, the cognitive process theory of writing models composing as recursive planning, translating, and reviewing under the writer's own monitor (Flower & Hayes, 1981), which clarifies where digital tools intervene: GenAI can offload some translating and reviewing load, but the planning, monitoring, and rhetorical decision-making that define expertise must remain, and be deliberately developed, in the writer. The community of inquiry framework further specifies the cognitive, social, and teaching presences that productive online writing communities require (Garrison et al., 2000), and feedback theory defines the qualities of feedback that move writers forward (Boud & Molloy, 2013; Hattie & Timperley, 2007). Finally, the TPACK framework reminds designers and supervisors that integrating technology into Malay writing instruction demands the intersection of technological, pedagogical, and content (linguistic-disciplinary) knowledge (Mishra & Koehler, 2006).

The Proposed Conceptual Model: Dh-Maw

Synthesising the reviewed literature and theories, the Digital Heutagogy for Malay Academic Writing (DH-MAW) model conceptualises the development of Malay academic writing capability among postgraduate students as the outcome of a self-determined, digitally mediated process, energised by learner agency, enabled by a curated digital ecosystem, sustained by graduated scaffolding and feedback, and consolidated through double-loop learning. Figure 2 presents the model; the following subsections elaborate its five components and their interrelations.

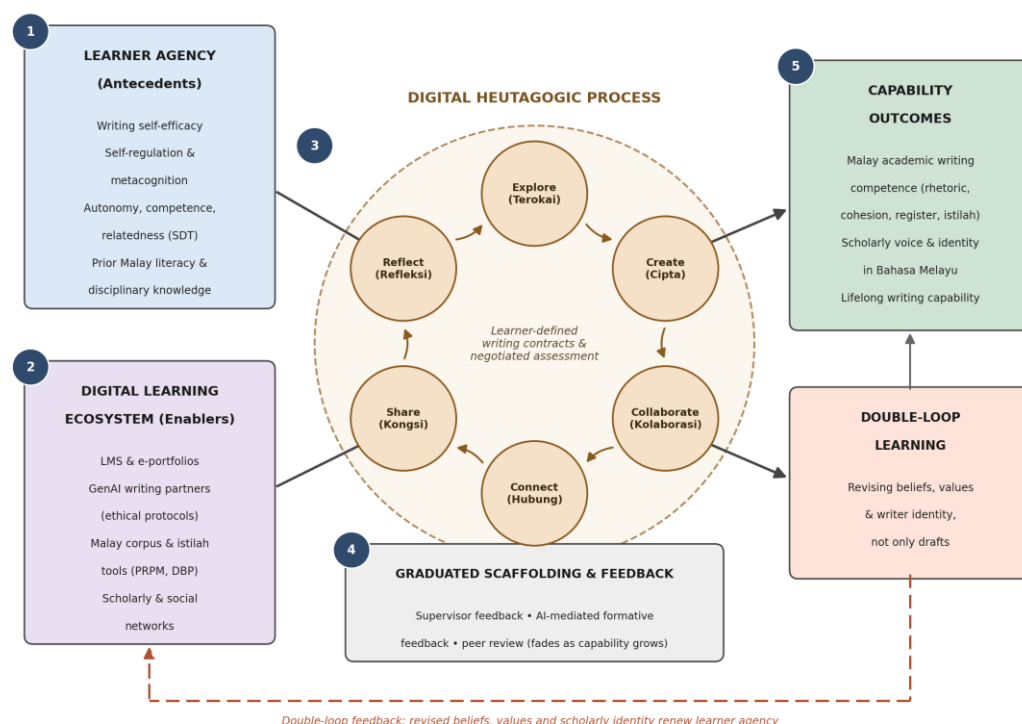


Figure 2. The Digital Heutagogy for Malay Academic Writing (DH-MAW) conceptual model (numbered badges 1–5 correspond to the five components elaborated in Sections 5.1–5.5)

Learner Agency (Antecedents)

The model begins with the postgraduate writer's agentic resources: self-efficacy for academic writing (Bandura, 1997); metacognitive and self-regulatory capacities (Zimmerman, 2002); motivation, understood through the SDT needs of autonomy, competence, and relatedness (Deci & Ryan, 2000); and prior resources, including first-language literacy in Malay and disciplinary knowledge. Consistent with the PAH continuum, these antecedents are treated as variable rather than assumed: learners enter at different points of readiness for self-determination, and the model's scaffolding component (5.4) exists precisely to develop readiness where it is incomplete (Moore, 2020; Stoten, 2020).

Digital Learning Ecosystem (Enablers)

The second component is the technological environment that makes self-determined writing feasible. It

comprises four layers: (1) institutional platforms, learning management systems and e-portfolios that host learner contracts, drafts, and reflective records; (2) GenAI writing partners used, under explicit ethical protocols, for brainstorming, outlining, register experimentation, and formative feedback (Kasneci et al., 2023; Kohnke et al., 2023), configured to sustain writer-led rather than AI-dependent collaboration patterns (Nguyen et al., 2024) and aligned with expert-validated frameworks for AI-supported, self-determined language learning (Kamrozzaman, 2025); (3) authoritative Malay language infrastructures, notably corpus and reference services such as the Pusat Rujukan Persuratan Melayu and Dewan Bahasa dan Pustaka terminology resources,

which anchor AI-assisted drafting to standardised Malay; and (4) scholarly and social networks, from supervision groups and postgraduate writing circles to academic social media, which supply the connectivity that digital heutagogy exploits (Blaschke & Hase, 2019; Narayan et al., 2019). The ecosystem is an enabler, not a driver: in line with TPACK, its educational value is realised only through pedagogically and linguistically informed use (Mishra & Koehler, 2006; Zawacki-Richter et al., 2019).

The Digital Heutagogic Process

At the model's core lies a cyclical process organised around learner-defined writing contracts and negotiated assessment (Blaschke & Hase, 2016; Narayan et al., 2019). Each postgraduate writer, in dialogue with supervisors or course facilitators, defines a personal writing agenda, for instance, mastering the literature review genre in Malay, or achieving terminological precision in a specialised domain, together with the evidence by which progress will be judged. The agenda is then pursued through the six digital heutagogic elements, glossed here for the Malay writing context. Explore (Terokai): learners investigate models of excellent Malay scholarly prose, mine corpora and reference tools, and interrogate GenAI for genre explanations. Create (Cipta): learners produce drafts, glossaries, annotated bibliographies, and multimodal artefacts in Bahasa Melayu. Collaborate (Kolaborasi): learners engage in peer review circles and co-writing, distributing expertise across the community (Vygotsky, 1978). Connect (Hubung): learners link with supervisors, disciplinary networks, and language authorities, extending their community of inquiry (Garrison et al., 2000). Share (Kongsi): learners publish work-in-progress to e-portfolios, colloquia, and open platforms, converting private drafts into public scholarship. Reflect (Refleksi): learners maintain reflective journals on both their texts and their beliefs about writing, feeding the double-loop mechanism (Blaschke, 2012). Table 2 maps each element to digital affordances and representative Malay academic writing activities.

Table 2. Digital heutagogic elements mapped to affordances and Malay academic writing activities

Heutagogic element	Digital affordances	Representative Malay academic writing activities
Explore (Terokai)	Search engines; corpus tools (PRPM); GenAI explanation and exemplification	Analysing model theses in Gaya UKM format; querying standardised istilah; studying rhetorical moves of Malay journal articles
Create (Cipta)	Word processors; GenAI outlining and register transformation; reference managers	Drafting chapters and manuscripts in bahasa baku; building personal terminology glossaries; converting colloquial drafts to formal register
Collaborate (Kolaborasi)	Shared documents; LMS forums; messaging groups	Peer review circles for Malay drafts; co-authoring conference papers; supervisor–student annotation dialogues
Connect (Hubung)	Academic social networks; webinars; email; institutional repositories	Engaging Malay studies communities; consulting DBP resources; networking at national colloquia
Share (Kongsi)	E-portfolios; blogs; open repositories; presentation tools	Publishing work-in-progress; presenting at postgraduate seminars; submitting to Malay-medium journals
Reflect (Refleksi)	Reflective e-journals; audio/video logs; AI-supported self-questioning	Journaling on writing beliefs and identity as a Malay-language scholar; auditing GenAI use and its effects on voice

Graduated Scaffolding and Feedback

Self-determined learning does not mean unsupported learning. Consistent with sociocultural theory and with critiques that heutagogy risks abandoning novices to autonomy they do not yet possess (Moore, 2020; Stoten, 2020), the model includes a scaffolding stratum that operates beneath the heutagogic cycle and fades as capability grows. Three feedback streams are specified. First, facilitator and supervisor feedback follows the feed-up, feed-back, feed-forward logic of effective feedback, addressed to the writer's self-defined goals (Hattie & Timperley, 2007). Second, AI-mediated formative feedback provides immediate, low-stakes

response on organisation, cohesion, and register, subject to verification against authoritative Malay references, converting GenAI from a ghost-writer into a rehearsal partner (Barrot, 2023; Kohnke et al., 2023). Third, peer feedback within writing circles develops evaluative judgement, the capacity to appraise quality, which sustainable feedback theory identifies as the durable outcome of feedback processes (Boud & Molloy, 2013). Across all streams, the design intent is graduated release: instructor control recedes along the PAH continuum as the writer demonstrates readiness (Blaschke, 2012).

Capability Outcomes and Double-Loop Learning

The model's proximal outcome is Malay academic writing competence: command of rhetorical organisation, cohesion, formal register, citation conventions, and standardised terminology adequate to the writer's discipline (Hyland, 2013; Universiti Kebangsaan Malaysia, 2015). Its distal outcome is capability: the self-determined capacity to write effectively in unfamiliar scholarly situations, new genres, new audiences, new tools, throughout a research career (Hase & Kenyon, 2013). The bridge between them is double-loop learning: through structured reflection, writers revise not only their texts but their beliefs about writing, their relationship to the Malay language as a language of knowledge, and their identity as scholars, and these revised beliefs feed back into learner agency, closing the model's outer loop (Blaschke, 2012; Hase & Kenyon, 2007). It is this identity-level change, rather than error reduction alone, that the model treats as the signature of heutagogic success.

Propositions

The reviewed literature and the model together yield nine propositions. Each is stated so that the relationship it asserts is of a determinate type, since a proposition that merely predicts association cannot be refuted informatively: three propositions assert direct effects, two assert mediation, and four assert moderation, with the expected sign of the interaction stated where theory permits. Table 3 sets out the propositions, the constructs involved, and the analytic strategy by which each would be tested.

Table 3. Propositions of the DH-MAW model, by relationship type

No.	Proposition	Relationship type	Constructs and directional form	Proposed test
P1	Learner agency, comprising writing self-efficacy and self-regulatory capacity, is positively associated with engagement in the six-element heutagogic process.	Direct	Learner agency → process engagement	Structural path in a measurement-validated model.
P2	Satisfaction of the basic psychological needs for autonomy, competence, and relatedness mediates the effect of contract-based heutagogic design on process engagement.	Mediating	Contract-based design → need satisfaction → process engagement	Bias-corrected bootstrapped indirect effect; partial mediation expected.
P3	The curation of the digital ecosystem, and specifically the integration of authoritative Malay terminology and corpus services, moderates the agency–engagement relationship, which is stronger where ecosystem curation is higher.	Moderating	Learner agency × ecosystem curation → process engagement	Interaction term with simple-slopes analysis at high and low curation.
P4	Process engagement is positively associated with growth in Malay academic writing competence, measured against a common capability	Direct	Process engagement → writing competence	Structural path with pre- and post-measurement of rubric-scored competence.

	rubric rather than by contract completion.			
P5	Scaffolding intensity moderates the engagement–competence relationship, and the moderation is itself conditional on readiness: the interaction of agency and scaffolding on competence is negative, so that the marginal value of scaffolding declines as agency rises.	Moderating, with specified sign	Process engagement × scaffolding intensity × learner agency → writing competence	Three-way interaction, or two-way interaction estimated separately within readiness strata.
P6	Adherence to the ethical generative AI protocol moderates the effect of generative AI use intensity on writing competence: the association is positive under high adherence and null to negative under low adherence.	Moderating, with crossover predicted	GenAI use intensity × protocol adherence → writing competence	Interaction term; crossover tested by region of significance rather than by median split.
P7	Double-loop reflection mediates the relationship between writing competence and durable writing capability and scholarly identity in Bahasa Melayu.	Mediating	Writing competence → double-loop reflection → capability and identity	Indirect effect estimated on longitudinal data, since the mediator is temporally downstream.
P8	Institutional readiness, comprising assessment-policy recognition of negotiated artefacts and supervisor technological-pedagogical-content readiness, moderates the engagement–competence relationship at the programme level.	Moderating, cross-level	Process engagement × institutional readiness → writing competence	Multilevel model with students nested within programmes; readiness scored using the audit in Table 6.
P9	Entry-level Malay academic register proficiency moderates the engagement–competence relationship, such that lower-proficiency writers require greater scaffolding intensity to achieve equivalent competence gains.	Moderating	Process engagement × entry proficiency → writing competence	Interaction term with a diagnostic register measure administered at contract formation.

Three features of this set are worth noting. Propositions 5 and 6 specify the sign of an interaction rather than merely its presence, which makes them falsifiable in a way that a general claim of moderation would not be: if scaffolding proved equally valuable at all levels of learner agency, the graduated-release logic that the model inherits from the PAH continuum would be disconfirmed. Proposition 8 is a cross-level claim, and it converts the institutional analysis of Section 6 into a testable quantity rather than leaving it as commentary. Proposition 9 makes explicit that the model does not assume uniform entry proficiency in the scholarly register, an assumption that would be untenable given the diglossic structure described in Table 1.

Taken together, the propositions define an empirical programme rather than a single study: Propositions 1 to 4 are estimable cross-sectionally, Propositions 5, 6 and 9 require sufficient variance in scaffolding, protocol adherence and entry proficiency to support interaction terms, Proposition 7 requires longitudinal measurement, and Proposition 8 requires data from more than one programme.

Implementation in Malaysian Higher Education Institutions

A conceptual model that cannot be operated is of limited use, and the distance between a model and its operation is largely institutional. This section addresses that distance directly. It sets out the barriers that a contract-based, digitally mediated writing programme would encounter in a Malaysian university, the structure and fair assessment of the writing contracts on which the model depends, the development that

supervisors would require, the ethical protocol governing generative AI use in Malay academic writing, a readiness audit and phased rollout, a minimum-viable configuration for constrained settings, differentiation by Malay language proficiency, and a checklist for practitioners.

Institutional Barriers and the Conditions for Adoption

Four barriers recur in the Malaysian evidence and in the wider heutagogy literature, and each has a determinate institutional location. The first is assessment regulation. Postgraduate progression is governed by regulations framed around chapter submission and examination, and negotiated artefacts such as terminology glossaries, corpus analyses, and reflective records have no standing within them; where an activity cannot be recognised, it will not be sustained, whatever its pedagogical merit (Narayan et al., 2019; Tiew & Abdullah, 2021). Programme learning outcomes must in any case be demonstrable against national qualifications requirements (Malaysian Qualifications Agency, 2017), which means that the route to a rubric criterion may be negotiated but the criterion itself may not.

The second barrier is supervisor readiness, considered further in Section 6.3. The third is workload. Contract supervision front-loads effort into goal setting and mid-cycle review, and a workload model that counts only examination will register this as unrewarded additional labour. The fourth is cultural. Malaysian students may enter postgraduate study with limited experience of negotiated assessment, and survey evidence on Malay language classrooms indicates that proactive, self-initiated learning remains the weakest of the heutagogical dispositions (Musa & Mahamod, 2025; Tiew & Abdullah, 2021). The implication is not that heutagogy is unsuited to the setting but that autonomy must be built rather than assumed, which is the function of the graduated scaffolding component and of the induction described in Section 6.5.

The conditions for adoption follow from the barriers. Regulatory recognition must precede pilot implementation rather than follow it; supervisor development must precede student enrolment; workload must be made visible in the contract itself, through counter-signed support commitments; and learner induction must be treated as part of the design rather than as preparation for it.

Structuring and Assessing Learner-Defined Writing Contracts

The writing contract is the mechanism through which self-determination is exercised in this model, and it is also the point at which the model is most exposed to the objection that negotiated goals cannot be assessed fairly against common standards. The objection is answered by a single design rule: the writer negotiates the route and the evidence, never the standard.

Rubric criteria are fixed by the institution and applied unchanged to every candidate; what varies is the writing goal that the candidate pursues and the artefacts through which attainment is demonstrated. A contract that proposed a lower standard would not be a heutagogic contract but a reduced requirement, and the distinction is what makes negotiated assessment defensible to an examination board.

Table 4 sets out the anatomy of the contract, with an illustrative entry for each field drawn from a candidate working on a literature review chapter in Bahasa Melayu, and the assessment treatment of each field.

Table 4. Structure of a learner-defined Malay academic writing contract, with illustrative entries and assessment treatment

Field	Content	Illustrative entry	Assessment treatment
Writing goal	One or two capability targets expressed in terms of what the writer will be able to do, not of pages produced.	“To write a literature review chapter in bahasa baku that synthesises rather than summarises, using gazetted istilah for the constructs of my field.”	Negotiated with the supervisor at contract formation; must map to at least one criterion of the common capability rubric.

Rationale	The writer's account of why this target matters for the thesis and for the scholarly identity being developed.	"My proposal defence feedback identified description rather than synthesis as the principal weakness."	Not assessed. Provides the reflective anchor for the double-loop element and the record for later comparison.
Evidence to be produced	The artefacts by which attainment will be judged, chosen by the writer from a permitted set.	Annotated corpus of ten Malay review articles; personal istilah glossary; two successive chapter drafts; a synthesis-matrix artefact.	The set of permitted artefact types is fixed by the graduate school; the selection within it is the writer's.
Milestones	Two or three dated checkpoints aligned to existing programme milestones rather than added alongside them.	Corpus and glossary by week 6; first draft by week 12; revised draft at the semester progress review.	Checked at the existing supervisory review; no new committee is created.
Criteria	The rubric criteria against which the artefacts will be scored, drawn unchanged from the common capability rubric.	Rhetorical organisation; register control; terminological accuracy; source integration; evidence of revision.	Fixed by the institution. The writer negotiates the route, never the standard.
GenAI declaration	A statement of which tools will be used, for which functions, and how outputs will be verified.	"Outlining and register feedback only; all terminology verified against PRPM; no generated text retained verbatim."	Compared at submission against the interaction log; discrepancy is treated as a contract breach, not as misconduct in the first instance.
Support requested	What the writer asks of the supervisor, peers, and the writing centre, making support demand-led.	Two annotation cycles from the supervisor; membership of a Malay writing circle; one terminology clinic.	Counter-signed, so that the supervisor's commitment is explicit and workload is visible.
Revision clause	The conditions under which the contract may be renegotiated mid-cycle.	"If the corpus analysis shows my field lacks Malay-medium review articles, the target shifts to adapting English conventions with justification."	Renegotiation is recorded rather than penalised; heutagogy treats emergence as expected, not as failure.

Three safeguards make the arrangement defensible. First, the common capability rubric is applied by the supervisor and moderated by a second reader within the programme, so that scoring does not vary with the ambition of the contract. Second, contracts are integrated with existing thesis milestones rather than added alongside them: contract formation coincides with proposal approval, mid-cycle review with the semester progress review, and final review with chapter submission, so that no new bureaucratic layer is created and the candidate is not assessed twice for the same work. Third, artefacts are drawn from a fixed permitted set defined by the graduate school, which prevents the negotiation from drifting into the substitution of easier evidence. Where a contract is renegotiated mid-cycle, the renegotiation is logged and treated as data about emergent learning rather than as a failure to plan, consistent with the nonlinear conception of learning that heutagogy inherits from complexity theory (Hase & Kenyon, 2007).

Supervisor Development and the TPACK Gap

Supervisors are the binding constraint. The model asks them to move from late corrective commentary to formative dialogue organised around goals they did not set, to advise on generative AI use they may not themselves have adopted, and to make judgements about Malay scholarly register for which no shared descriptive vocabulary exists. This is a technological, pedagogical, and content demand simultaneously, which is precisely the intersection that TPACK identifies as the site of difficulty (Mishra & Koehler, 2006), and

academics' own adoption of generative AI is known to be uneven and shaped by institutional signals rather than by individual preference (Nikolic et al., 2024).

A development programme adequate to this demand has three strands rather than one. The pedagogical strand covers feed-up, feed-back, and feed-forward against learner-defined goals, and the cultivation of evaluative judgement rather than error correction (Boud & Molloy, 2013; Hattie & Timperley, 2007). The content strand covers Malay scholarly register, affixation-driven nominalisation, and terminology verification, and should be delivered by Malay studies specialists rather than by generic academic development staff. The technological strand covers the protocol in Section 6.4, including the practical skill of reading an interaction log. The programme should itself be delivered heutagogically, with supervisors contracting their own development goals, since a directive workshop about self-determined learning models the opposite of what it teaches.

An Ethical Protocol for Generative AI in Malay Academic Writing

The model treats generative AI as a rehearsal partner rather than a proxy author, but a stance is not a protocol, and the distinction between rehearsal and proxy authorship must be operational if supervisors are to apply it. Table 5 sets out a four-category protocol specific to Malay academic writing. The categories are defined by what happens to the writer's cognitive work rather than by the tool used, since tools change faster than regulations can be rewritten.

Table 5. Ethical protocol for generative AI use in postgraduate Malay academic writing

Category	Permitted functions	Required conditions	Rationale
Permitted without declaration	Explanation of a genre convention; definition of a term already gazetted; comprehension checking of a source the writer has read.	None beyond ordinary academic care.	No generated sentence enters the draft.
Permitted with declaration and verification	Outlining; register transformation of the writer's own sentences from colloquial to baku; cohesion and organisation feedback; formative critique of the writer's draft.	Every terminological suggestion checked against Pusat Rujukan Persuratan Melayu or Dewan Bahasa dan Pustaka before adoption; prompt and output retained in the e-portfolio log.	The idea and the sentence originate with the writer; the tool responds to text the writer produced.
Permitted only under supervision	Generation of example sentences or model paragraphs for analysis; translation of the writer's English notes into Malay for subsequent rewriting.	Artefacts labelled as machine-generated, kept separate from the draft file, and discussed at a supervisory meeting.	Used as an object of study rather than as material for insertion.
Prohibited	Generation of thesis prose for direct or lightly edited insertion; generation of literature summaries for sources not read; fabrication or unverified attribution of citations; machine translation of whole chapters.	Not applicable.	Authorship, and the cognitive work that authorship names, would pass to the tool.
Terminology rule	Applies across all permitted categories.	Where a model proposes a term, the writer records the gazetted equivalent, the source	Malay terminology is authorised rather than conventional, so

		of verification, and the decision taken where the two diverge.	model output cannot be self-validating.
Disclosure at submission	A short statement appended to the thesis or manuscript.	Tools used, functions used for, verification method, and a declaration that no generated text appears verbatim.	Makes the writer's practice inspectable without requiring surveillance.

Two features distinguish this protocol from generic institutional AI policies. The first is the mandatory terminology verification rule, which follows from the gazetted character of Malay scholarly terminology described in Table 1: a model suggestion cannot be accepted on the model's authority because the authority lies elsewhere. The second is that breach is handled in the first instance as a contract matter between candidate and supervisor rather than as an integrity allegation. Treating every discrepancy as misconduct would drive use underground and destroy the log on which the whole arrangement depends; reserving the integrity process for the prohibited category preserves both candour and deterrence. Student surveys consistently report that candidates want clarity about acceptable use rather than permission for unlimited use (Chan & Hu, 2023; Johnston et al., 2024), which suggests that an explicit protocol is more likely to be welcomed than resisted.

Institutional Readiness and Phased Implementation

Readiness is not a single quantity, and institutions are commonly strong on one dimension and weak on

another. Table 6 sets out an audit across five dimensions, each described at four levels of maturity, so that an institution can locate itself and identify the specific deficit that would defeat implementation. The instrument is intended to be completed jointly by the graduate school, the writing centre, and a programme team, since each sees a different part of the problem.

Table 6. Institutional readiness audit for contract-based digital heutagogic writing provision

Dimension	Level 1: Absent	Level 2: Emerging	Level 3: Established	Level 4: Embedded
Assessment policy	Negotiated artefacts have no standing; only conventional chapters are examinable.	Artefacts may be submitted as appendices at the supervisor's discretion.	Programme regulations recognise a defined set of negotiated artefacts within progress review.	Contract-based progression is embedded in postgraduate regulations and moderated across programmes.
Supervisor capability	Supervisors give corrective feedback late in the drafting cycle and have no shared feedback framework.	Some supervisors use formative feedback; practice varies widely and is undocumented.	A structured development programme covers feedback pedagogy, Malay scholarly discourse, and AI affordances.	Supervisor development is recurrent, and contract supervision is recognised in workload models.
Digital infrastructure	No institutional e-portfolio; unreliable connectivity; no licensed AI provision.	Learning management system present but used for content delivery only.	E-portfolio and collaborative drafting available; terminology services linked from the institutional environment.	An integrated, curated ecosystem with institutional AI provision and logged, auditable use.

Learner readiness	Students expect direction and have not encountered negotiated assessment.	Students accept autonomy in principle but lack the strategies to exercise it.	A structured induction develops contracting, self-assessment, and reflection.	Self-determined practice is normal, and senior candidates mentor incoming cohorts.
Malay language resource base	No shared rubric for Malay academic writing; terminology work is left to the individual.	A style manual exists but is not operationalised as an assessment instrument.	A common capability rubric is in use and terminology verification is an expected step.	The institution contributes corpora, exemplars, and rubrics back to the national resource base.

An institution scoring at Level 1 on assessment policy should not begin, whatever its scores elsewhere, because the artefacts the model generates would have nowhere to go. An institution at Level 1 on digital infrastructure may nonetheless begin, using the minimum-viable configuration set out in Section 6.6. This asymmetry matters: the regulatory constraint is binding, whereas the technological constraint is substitutable.

Implementation should then proceed in phases across three semesters, as set out in Table 7. The sequence is deliberate, and the third column states what is lost by taking the phases out of order.

Table 7. Phased implementation across three semesters

Phase	Principal activities	Output	Why this order
Semester 1: Foundation	Complete the readiness audit in Table 6; convene a working group of the graduate school, the writing centre, and two Malay-medium programmes; draft the common capability rubric and the GenAI protocol; secure a regulatory ruling on the standing of negotiated artefacts.	A rubric, a protocol, and a written regulatory position. No students are enrolled in the new arrangement.	Attempting rollout before the assessment question is settled is the most common way in which contract-based schemes fail.
Semester 2: Pilot	Run the model with one cohort in one programme, with volunteer supervisors who have completed the development module; contract formation at the start, one mid-point review, one end-point review; collect rubric scores, contract documents, and e-portfolio logs.	Evidence on contract quality, supervisor workload, and student experience; a first estimate of scaffolding calibration.	A single-programme pilot keeps the number of confounded variables low enough that failure is interpretable.
Semester 3: Consolidation and scaling	Revise the rubric and protocol against pilot evidence; extend to two or three further programmes; introduce cross-programme moderation of rubric scoring; formalise supervisor development as recurrent provision.	A moderated, multi-programme implementation with documented calibration and a workload model.	Scaling before moderation produces divergence in standards that is subsequently very difficult to recover.

Implementing under Infrastructure and Digital Literacy Constraints

The model as described assumes a curated digital ecosystem, and that assumption will not hold in every institution. Some Malaysian universities and university colleges operate without an institutional e-portfolio, without licensed generative AI provision, and with connectivity that is uneven for students studying part-time

from outside major urban centres. Students in the same cohort will also differ in digital literacy, and a design that treats digital fluency as an entry assumption converts a support problem into an equity problem.

The response is to distinguish the function each ecosystem layer performs from the technology that currently performs it. Table 8 sets out the full configuration alongside a minimum-viable configuration for each layer, together with the function that must be preserved in either case.

Table 8. Full and minimum-viable configurations of the digital learning ecosystem

Ecosystem layer	Full configuration	Minimum-viable configuration	Function that must be preserved
Institutional platform	Institutional e-portfolio integrated with the learning management system, hosting contracts, drafts, and reflective records.	A shared folder structure with a versioned document naming convention, plus a single contract document per candidate.	The function required is a durable, inspectable record of successive drafts, not a particular platform.
Generative AI provision	Institutionally licensed model with logged access and configured prompts.	Free-tier tools used on the student's own device, with prompts and outputs pasted into the contract log manually.	The protocol in Table 5 governs use regardless of provision; logging can be manual without loss of accountability.
Malay language resources	Terminology and corpus services linked directly from the institutional environment.	Direct use of the freely accessible Pusat Rujukan Persuratan Melayu, plus a printed departmental istilah list for the discipline.	This layer is the least substitutable, but it is also already free at the point of use.
Collaboration and networks	Online writing circles, shared annotation, and academic social networks.	Face-to-face writing circles scheduled during existing seminar slots; annotation on printed drafts.	Relatedness, in the self-determination sense, is produced by the circle rather than by the platform.
Digital literacy	Assumed, with optional support.	A short compulsory induction covering version control, referencing software, and prompt discipline, with a diagnostic at entry.	Where digital literacy is uneven, treating it as an assumption converts a support problem into an equity problem.

Only one layer resists substitution, and it is the Malay language resource layer; but that layer is also the one already available without cost through national provision. The practical conclusion is that the model is less infrastructure-dependent than its full description suggests, provided that institutions are willing to accept manual logging and face-to-face collaboration in place of platform-mediated equivalents. What cannot be substituted is the discipline of recording: a contract that is not written down, and a generative AI interaction that is not logged, remove the evidentiary basis on which both assessment and reflection depend.

Adapting to Varying Levels of Malay Language Proficiency

Postgraduate candidates writing in Bahasa Melayu do not form a homogeneous group, and the diglossic structure described in Table 1 means that everyday fluency is a poor predictor of scholarly register control. Three profiles recur, and each requires a different calibration of the same model rather than a different model.

The first profile is the fluent everyday speaker with limited scholarly register. This is the largest group and the one most often misdiagnosed, since apparent fluency masks a productive gap in bahasa baku. For these writers the contract should foreground register transformation and affixation, and generative AI is most

valuably used for register feedback on the writer's own sentences under the conditions of Table 5. The second profile is the writer for whom Malay is an additional or non-dominant academic language, including candidates educated in English-medium or Chinese-medium and Tamil-medium streams, and international candidates in Malay studies. For these writers scaffolding intensity should begin higher and fade more slowly, terminology work should precede rather than accompany drafting, and the permitted-with-supervision category of the AI protocol becomes more important, since analysis of model paragraphs is a legitimate route into a genre the writer has not read widely in. The third profile is the returning practitioner, often a teacher or civil servant with strong formal Malay but limited exposure to research genres; for these writers the deficit is rhetorical rather than linguistic, and the contract should target move structure and stance rather than register.

Two design commitments follow. Entry diagnosis of scholarly register, distinct from general language proficiency, should be administered at contract formation, and the initial scaffolding level should be set against it explicitly and recorded, so that fading can later be justified. And the rubric should remain constant across profiles: differentiating the standard rather than the support would reproduce, under a heutagogic label, precisely the inequity that differentiated support is meant to remove. Proposition 9 states this relationship in testable form.

A Practitioner Implementation Checklist

Table 9 consolidates the preceding sections into a checklist organised by responsible actor and by timing. It is intended to be used as a working document by a graduate school or programme team rather than read as an argument, and it is offered as the companion instrument to the model.

Table 9. Practitioner implementation checklist for the DH-MAW model

Responsible actor	Action	Timing
Graduate school	Readiness audit completed against Table 6 and scored	Before semester 1 ends
Graduate school	Regulatory position on negotiated artefacts obtained in writing	Before any pilot
Graduate school	Common capability rubric approved and published to students	Before contract formation
Graduate school	GenAI protocol adopted and communicated in both Malay and English	Before contract formation
Programme	Supervisor development module delivered to all supervising staff in the pilot	Before the pilot cohort enrolls
Programme	Contract template circulated, with two worked exemplars from the discipline	At induction
Programme	Entry diagnostic of Malay academic register administered	At contract formation
Programme	Digital literacy diagnostic administered and support scheduled	At contract formation
Supervisor	Contract counter-signed, with support commitments stated and workload noted	Week 2 to 3
Supervisor	Scaffolding level set explicitly against the entry diagnostic, and recorded	At contract formation
Supervisor	Mid-cycle review conducted against the contract, not against page count	Mid-semester
Supervisor	GenAI declaration compared against the interaction log at submission	At each submission

Student	Writing goal, evidence, milestones, and support requests specified	Week 1 to 2
Student	Terminology glossary started and verified against authoritative sources	Ongoing
Student	Reflective entries recorded at each milestone, addressing beliefs as well as text	At each milestone
Student	Writing circle participation sustained across the cycle	Ongoing
Institution	Cross-programme moderation of rubric scoring conducted	End of each cycle
Institution	Contract renegotiations logged and reviewed for pattern rather than penalised	End of each cycle

The checklist is deliberately short and omits desirable but non-essential activity. Its four load-bearing items are the regulatory ruling, the common rubric, the supervisor development module, and the entry diagnostic; an implementation that completed only these four would be viable, whereas one that completed everything else and omitted any one of them would not.

DISCUSSION AND IMPLICATIONS

Theoretical Implications

The DH-MAW model contributes to theory in three ways. First, it answers calls for domain-specific articulations of heutagogy (Agonaćs & Matos, 2019; Moore, 2020) by specifying how self-determined learning is configured for a concrete, high-stakes literacy, postgraduate academic writing, in a national language context. Second, it integrates heutagogy with SDT, SRL, sociocultural theory, and the cognitive process theory of writing into a single explanatory chain from motivation through process to identity-level outcomes, extending recent Malaysian work that pairs heutagogy with psychological needs (Abdullah et al., 2025). Third, it theorises GenAI within heutagogy: rather than treating AI as a tool bolted onto instruction, the model positions it as a mediating artefact whose developmental value is conditional on learner agency and ethical framing, a stance consistent with emerging scholarship on AI in writing education (Kasneci et al., 2023; Nguyen et al., 2024; Warschauer et al., 2023) and with recent Malaysian frameworks converging heutagogy, m-learning, and AI for language education (Kamrozzaman, 2025).

Practical and Pedagogical Implications

The operational detail of practice is set out in Section 6 and is not repeated here. What deserves emphasis at the level of implication is the shape of the change the model requires. It is not the addition of a technology to existing provision but the replacement of episodic, instructor-directed workshops with a contract-governed process that runs alongside the thesis and is recognised by the regulations that govern it. That replacement is institutional before it is pedagogical, which is why Section 6 treats assessment policy and supervisor development as prior conditions rather than as supporting measures. Two cautions follow. The model should not be read as licensing uniform autonomy: diagnostic attention to learner readiness governs how quickly scaffolding fades (Stoten, 2020), and Table 6 makes the institutional analogue of that judgement explicit. Nor should the digital ecosystem be read as a prerequisite in its fullest form, since Table 8 shows that most of its layers are substitutable provided the discipline of recording is preserved.

Policy Implications

At the policy level, the model aligns two national agendas that are often pursued separately: the transformation towards self-determined, technology-enhanced learning envisioned in the Malaysia Education Blueprint for higher education (Ministry of Education Malaysia, 2015), and the empowerment of Bahasa Melayu as a language of advanced knowledge. Investing in Malay-capable AI writing support, open corpora, and interoperable terminology services is, on this account, simultaneously educational technology policy and

language policy. Funding bodies and journal ecosystems in the Malay-speaking world can further reinforce the model's outcome layer by expanding reputable Malay-medium publication venues and recognising them in academic reward systems.

LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

As a conceptual paper, this work has inherent limitations, and four should be stated plainly. The DH-MAW

model is derived from a narrative synthesis of literature rather than from systematic review or primary data, so its components and its nine propositions await empirical validation; nothing in Table 3 is established. The implementation guidance in Section 6, including the readiness audit, the phased rollout, and the checklist, is reasoned from the documented barriers in the Malaysian literature rather than derived from a completed implementation, and its instruments have not been trialled. The account of Malay-specific features in Table 1 rests on institutional style manuals and on the terminological infrastructure rather than on a corpus-based description of Malay academic prose, which does not yet exist at the scale available for English; this is itself a finding about the field, but it means the contrasts drawn are principled rather than quantified. Finally, the model is specified for Bahasa Melayu in Malaysian institutions, and its transfer to other national languages of scholarship is an empirical question rather than an assumption.

Four research directions follow. First, instrument development and model testing: the propositions in Table 3 can be operationalised into measurable constructs and tested through structural equation modelling with postgraduate students writing in Malay, with the moderation claims in Propositions 5, 6 and 9 requiring designs that generate sufficient variance in scaffolding intensity, protocol adherence, and entry register proficiency, and Proposition 8 requiring a multilevel design across programmes, extending work such as Abdullah et al. (2025) from general self-determined learning to writing-specific outcomes. Second, design-based research: iterative implementation of the three-semester rollout in Table 7 would refine the process component, the scaffolding calibrations, and the readiness instrument itself (Narayan et al., 2019). Third, linguistic and ethical inquiry: studies should examine the quality of generative AI output in formal Malay scholarly register and against gazetted terminology, the effects of AI mediation on authorial voice, and the workability of the protocol in Table 5 under supervisory conditions, responding to concerns raised in the international literature (Barrot, 2023; Chan & Hu, 2023; Warschauer et al., 2023). Fourth, corpus development: the absence of a Malay academic corpus and of a Malay academic word list is the deepest infrastructural constraint identified in this paper, and building them would benefit the field well beyond this model. Comparative work across national and regional languages of scholarship would additionally test the transferability of the model beyond the Malay context.

CONCLUSION

This paper set out to conceptualise how postgraduate students' academic writing in the Malay language can be developed through digitally mediated, self-determined learning. Synthesising heutagogy with self-determination theory, self-regulated learning, sociocultural theory, and the cognitive process theory of writing, it proposed the DH-MAW model, in which learner agency, a curated digital ecosystem, a six-element heutagogic process organised around learner-defined writing contracts, graduated scaffolding and feedback, and double-loop learning jointly produce not only Malay academic writing competence but durable writing capability and scholarly identity in Bahasa Melayu. In an era in which generative artificial intelligence is rewriting the conditions of authorship, the deepest contribution of heutagogy may be its insistence that the writer, not the tool and not the instructor, must remain the determining agent of learning. Anchoring that agency in the national language of scholarship is both an educational and a cultural undertaking. The model offered here is intended as a theoretically grounded and empirically testable step towards it, and, through the implementation section, as one that states the institutional, regulatory, technological, and linguistic conditions under which it could actually be run. Whether those conditions can be met, and whether the nine propositions survive contact with data, are questions the model is designed to make answerable rather than to settle.

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