



Editorial: Empowering language teacher agency: Self-directed and informal approaches to professional development

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Abstract

This editorial introduces the special issue *Professional Development: Reflections on Informal Initiatives and Self-Directed Strategies*, which explores how language teachers sustain professional growth amid continuous technological and pedagogical change. Traditional professional development often faces difficulties in meeting teachers' diverse and evolving needs, particularly as digital transformation and generative artificial intelligence reshape language teaching. In contrast, informal and self-directed learning enable teachers to exercise autonomy, pursue contextually relevant goals, and connect learning directly with classroom practice. At the same time, these approaches highlight disparities in access, digital literacy, and institutional support. The contributions in this volume examine how teachers navigate such challenges through reflective practice, peer collaboration, and engagement with emerging technologies. Together, they point to the need for professional learning ecosystems that integrate autonomy with structure, individual initiative with collective inquiry, and innovation with ethical and contextual awareness. The issue argues that empowering teacher agency depends on reimagining formal professional development to complement, rather than replace, the informal learning already undertaken by teachers.

Keywords: teacher agency, self-directed professional development (SDPD), informal learning, artificial intelligence in language teaching, professional learning ecosystems

Introduction

Language teachers worldwide are confronted with a persistent challenge: sustaining professional relevance amidst continuous pedagogical, technological, and social evolution, with changing learner needs, skills, and environments. While it is certainly not the only concern, technology

has perhaps received the most attention over the past few years, and a recent longitudinal study on digital transformation initiatives reveals that nearly half of the teachers surveyed experience “anxious acceptance” when adopting new technologies, characterised by simultaneous recognition of necessity and persistent apprehension about implementation (Luo et al., 2025). This example illustrates the point that while institutional provisions of professional development (PD) are ostensibly designed to support teacher learning, they struggle to maintain pace with these changes. So-called “traditional” professional development models—characteristically delivered through mandated workshops, isolated training sessions, or hierarchical initiatives—frequently fail to address the immediate, contextualised needs of practising teachers (Asterhan & Lefstein, 2024; Hill et al., 2013), leaving many teachers feeling the need to seek out alternatives.

Concerns about the effectiveness of professional development practices in language teaching have been raised before (Farrell, 2022), but there is still little evidence of the potential problems in research into PD for language teachers. There are, however, several examples from other fields that shed light on the extent of the problem. For instance, a large-scale analysis of 16,072 STEM teachers demonstrated that conventional professional development approaches often lack the sustained, practice-embedded support necessary for meaningful technology integration (Liu et al., 2024). Similarly, in the field of literacy education, a randomised controlled trial involving 63 teachers across seven schools found that a professional development programme—comprised of a three-day summer workshop and subsequent 1-on-1 visits by a coach to train teachers in reading instruction strategies—had no significant impact on student reading performance, despite the programme’s 15-year track record and widespread use across hundreds of schools (Jacob, 2017). Such limitations have prompted many teachers to look beyond formal provisions, increasingly taking ownership of their professional growth through self-directed, informal learning opportunities. This shift has been further accelerated as artificial intelligence (AI) technologies introduce new dimensions of complexity to language teaching and learning.

This disconnect is especially pronounced in less-than-optimal environments, where teachers’ baseline working conditions compound the shortcomings of formal professional development. Practitioners in rural, low-infrastructure, or under-resourced settings frequently report that even if training is offered, limited connectivity, device scarcity, and insufficient technical support make sustained uptake structurally unrealistic (see Tafazoli & Picard, 2023). In such contexts, the “choice” to alternative PD is not a purely agential decision but is entangled with systemic constraints, often forcing teachers to undertake professional learning after hours, at personal expense, and with little institutional recognition.

Increasingly, language teachers are seizing control of their professional learning trajectories. They independently seek resources, experiment with novel approaches in their classrooms, forge connections with peers across digital platforms, and engage in critical reflection on their practice. This shift towards self-directed professional development (SDPD) and informal learning represents more than simply discovering alternative routes to knowledge acquisition. Research examining K-12 teachers’ use of ChatGPT for professional development reveals that generative AI tools can play an important role in motivating teachers to advance their SDPD, particularly by providing immediate access to instructional resources and pedagogical strategies (Li et al., 2025). Yet self-directed approaches bring their own challenges. Without appropriate guidance, teachers may encounter resources of variable quality, engage with content at a surface level, or experience professional isolation. Moreover, such approaches risk exacerbating existing inequities where access to technology and digital literacy remain uneven. The contemporary PD environment foregrounds a conception of teacher professionalism that

centres agency, autonomy, and contextualised problem-solving, where passive consumption of externally mandated training is neither viable nor necessary.

The emergence of generative AI technologies since late 2022, following the COVID-19 pandemic, has both intensified the need for self-directed professional development and at the same time has highlighted the inadequacy of many existing formal programs. Teachers find themselves expected to understand, evaluate, and integrate tools like ChatGPT whilst simultaneously navigating ethical complexities, addressing concerns about academic integrity, and supporting students in developing critical digital literacies. Examination of beginning and first-year language teachers' readiness for the generative AI age reveals significant variations in confidence and preparedness, with many feeling overwhelmed by the rapid pace of change (Moorhouse, 2024). Traditional one-off workshops prove manifestly insufficient for developing the nuanced technological pedagogical knowledge required to navigate this rapidly shifting landscape, a reality confirmed by systematic analyses of teacher professional development at scale (Luo et al., 2025). The challenge extends beyond mere technical competence: teachers require frameworks for evaluating AI tools, understanding their underlying mechanisms, recognising their limitations, and making informed pedagogical decisions about integration.

This special issue examines self-directed and informal professional development in language education, particularly as it intersects with digital transformation and emerging AI technologies. We explore how teachers navigate their own learning journeys, the affordances and limitations of teacher-led professional growth, the role of collaborative networks and communities of practice, and the cultural and contextual factors that shape how teachers exercise agency in their professional development. We argue that supporting teacher agency requires not abandoning formal PD provisions, but rather reimagining them to complement and enhance the informal, self-directed learning that teachers already undertake.

The Inadequacy of Traditional Professional Development

The shortcomings of conventional professional development models are evident across multiple dimensions, from the lack of a relationship with pedagogical practices and outcomes to the constant lag of PD compared with technological developments, and the ongoing inequity in terms of accessibility to professional development. Research examining teachers' perspectives on professional development reveals consistent patterns of dissatisfaction with training that feels imposed rather than responsive to authentic classroom needs (Coppe et al., 2024). Teachers frequently describe institutional training as disconnected from their classroom realities, delivered in formats that ignore their existing expertise, and implemented without regard for local contexts or constraints (Farrell, 2022). One-size-fits-all workshops conducted by external consultants, cascade models where information flows from policy centres to classroom teachers, and compliance-focused training that prioritises institutional accountability over teacher learning all exemplify approaches that undermine rather than support genuine professional growth. Analysis of teacher professional development trajectories across career stages reveals that these needs vary more within than between career phases, yet conventional models rarely account for such nuanced variation (Coppe et al., 2024). The result is professional development that fails to meet teachers where they actually are in their practice.

These limitations become particularly acute for teachers working in under-resourced or geographically isolated settings. When professional development requires travel to urban centres, substantial financial investment, or release time that schools cannot provide, many teachers find themselves systematically excluded from formal learning opportunities. International survey data indicate that over half of teachers report schedule conflicts as barriers to participation, with costs and lack of incentives as secondary obstacles (Boskins & Nusche, 2021), while

teachers in rural and remote locations face additional challenges accessing opportunities available in metropolitan areas (Reagan et al., 2019).

Investigation of networked professional learning communities across diverse geographic contexts demonstrates how digital platforms can partially address these spatial constraints, yet significant barriers persist (McPherson & Asghar, 2023). Even when access exists, the content may reflect assumptions about teaching contexts that do not align with teachers' lived realities. Training on technology integration assumes reliable infrastructure that may not exist. Workshops on communicative language teaching approaches may seem irrelevant to teachers facing examination-driven curricula and large class sizes. While this is true across virtually all educational contexts, systematic reviews of professional learning communities in the Global South emphasise how contextual factors including a lack of infrastructure leadership support fundamentally shape the viability of different professional development approaches (Nguyen et al., 2023). Such geographical and resource-based disparities create unequal opportunities for professional growth that mirror broader patterns of educational inequality.

For many teachers faced with 'inadequacy' of professional development, undertaking SDPD is not a matter of preference but material circumstance: formal professional development is logistically inaccessible, structurally misaligned with local realities, and often predicated on tacit assumptions about infrastructure and time availability that are not globally shared. In some settings, teachers report resorting to printed handouts of online resources because they cannot reliably stay online long enough to complete a sustained learning task (see McCallum & Tafazoli, 2024). A lack of access to formal provisions of PD not only restricts participation, but it also reframes professional development from an institutional responsibility to a private, self-funded obligation.

The temporal structure of traditional professional development creates additional challenges; research indicates that without sustained duration and embedding within classroom practice, improvements dissipate quickly and fail to become rooted in teachers' repertoires (Kennedy, 2016; Sims et al., 2025). Teachers return from training sessions enthusiastic but unsupported in implementation, and initial motivation fades when faced with the press of daily demands. Research on digital instructional integration demonstrates that effective technology adoption requires sustained, practice-embedded professional development rather than one-time training events (Luo et al., 2025). Without opportunities for sustained engagement, experimentation, feedback, and reflection, professional development becomes an isolated event rather than an ongoing process. This temporal misalignment proves particularly problematic for emerging technologies like generative AI, where rapid evolution renders yesterday's training potentially obsolete today.

Perhaps most fundamentally, formal models of professional development have the potential to position teachers as passive recipients of expert knowledge rather than active agents in their own learning. This orientation undermines teacher professionalism and ignores the considerable expertise that practising teachers develop through years of classroom experience. Bibliometric analysis of teacher professionalism research spanning 1960–2024 identifies professional autonomy and professional identity as emerging focal points, reflecting growing recognition that teachers require genuine agency in shaping their own development (Coban, 2025). When professional development is framed primarily as a way to remediate teacher deficits rather than as a way to give agency to knowledgeable professionals seeking to refine their practice, it creates resistance rather than engagement. Studies of teacher leadership and agency in virtual communities demonstrate that teachers exercise meaningful professional learning when they can proactively take control of their learning journey, exploring areas of personal interest and expertise (Shal et al., 2024). The rapid evolution of AI technologies has intensified

these tensions, as teachers recognise that external experts may themselves be navigating these tools for the first time, undermining traditional hierarchies of expertise.

The Shift Towards Self-directed Professional Development

Amidst these limitations, self-directed professional development has emerged as a vital alternative. SDPD involves teachers taking initiative and responsibility for their own learning by identifying personal development goals, locating and curating resources, and assessing their own progress. Rather than waiting for institutional provision, teachers who engage in SDPD actively seek out learning opportunities aligned with their immediate needs and interests. This might include reading professional literature, watching instructional videos, experimenting with new pedagogical approaches, or participating in online communities of practice. Recent research demonstrates that teachers increasingly turn to generative AI tools like ChatGPT to support their SDPD, using these platforms to gain inspiration for classroom pedagogies, generate lesson plans, and access just-in-time pedagogical strategies (Samala et al., 2024). This represents a significant shift from dependence on institutional structures towards autonomous professional learning enabled by readily accessible digital resources.

The affordances of SDPD are considerable. It offers flexibility, allowing teachers to pursue learning at times and paces that suit their schedules and learning preferences. It enables personalisation, as teachers select resources and focus areas directly relevant to their contexts rather than engaging with generic content. It promotes agency and professionalism by positioning teachers as capable decision-makers about their own learning rather than passive consumers of mandated training (Stockwell, 2025b). Analysis of microlearning approaches demonstrates that flexible, self-directed pathways enable teachers to engage in continuous skill enhancement through webinars, action research projects, and digital learning communities (Kohnke, 2024). Perhaps most importantly, SDPD can be immediately integrated with practice, as teachers experiment with new approaches in their own classrooms and adjust based on what they observe. This tight coupling between learning and application contrasts sharply with traditional professional development's delayed implementation.

However, SDPD is not without challenges and limitations. Not all teachers enter self-directed learning with equal resources, confidence, or support. Those lacking familiarity with professional literature may struggle to locate high-quality resources. Teachers working in isolation may have limited opportunities for dialogue about their learning. Without institutional support—whether through dedicated time, access to resources, or collegial communities—self-directed professional development risks becoming yet another demand on already overburdened teachers. Systematic examination of teachers' emotional wellbeing and SDPD through an ecological perspective reveals how multiple contextual layers shape teachers' capacity for self-directed learning, with systemic stressors potentially overwhelming individual agency (Irgin, 2025). These systemic constraints, moreover, intersect with more tangible barriers to access.

For instance, the digital divide in access to technology and connectivity compounds these inequalities. Research on digital transformation in education demonstrates how experiences with digital technology fundamentally shape future relationships with AI tools, creating disparate opportunities for professional learning that risk widening existing gaps between well-resourced and under-resourced teachers (Bentley et al., 2024). These structural inequities mean that SDPD, whilst offering genuine affordances, cannot serve as a universal solution without attention to the conditions that enable or constrain its effectiveness. Critically, teachers in marginalised or peripheral contexts often face a paradox: SDPD is simultaneously the only feasible route to professional development and the least supported (Stockwell, 2025a). In low-bandwidth settings, for example, downloading a single article or attending an online webinar may

require multiple attempts. These realities remind us that self-direction is not simply a matter of motivation or autonomy; it is conditioned by infrastructural possibility.

Professional Learning Communities and Collaborative Learning

One response to the challenges of isolated self-directed learning has been the cultivation of professional learning communities (PLCs). PLCs provide structures for sustained collaborative inquiry where teachers engage in ongoing dialogue about practice, examine student work together, share instructional strategies, and collectively solve problems. Unlike isolated individual learning, PLCs create opportunities for social learning where teachers benefit from diverse perspectives, collective expertise, and mutual support. Comprehensive analysis of PLC research from 2019–2024 identifies twelve distinct issues shaping contemporary PLCs, with particular attention to challenges including teacher motivation, administrative support, workload constraints, and financial limitations (Nguyen et al., 2024). These challenges underscore that PLCs succeed not through structural existence alone but through sustained attention to the conditions supporting meaningful collaboration.

Digital technologies have expanded the possibilities for PLCs beyond geographical boundaries. Teachers can now participate in online communities connecting practitioners across schools, regions, and countries. These virtual spaces enable sharing of resources, discussion of pedagogical challenges, and exchange of practical strategies in ways that transcend the limitations of proximity. Research examining network PLCs demonstrates how distributed approaches to professional learning offer broad influence and unique benefits, with evidence suggesting that the nexus between reflective and practical learning improves teacher efficacy (Brennan & Gorman, 2023). Investigation of 16,072 STEM teachers reveals that PLCs play a crucial mediating role in linking individual professional development efforts with digital instructional integration, particularly when teachers engage in sustained collaborative inquiry focused on technology adoption (Liu et al., 2024). This mediating function proves especially important as teachers navigate the complexities of emerging technologies like generative AI, where collective expertise can compensate for individual uncertainty.

However, the affordances of digital PLCs assume certain baseline conditions, such as stable connectivity, devices capable of sustained participation, and the time/space to engage synchronously or asynchronously. For teachers in lower-resource settings, these assumptions are not trivial. Participation may require the use of personal mobile phones with limited data plans, irregular access to electricity, or involvement during after-hours because the school day leaves no dedicated time. As a result, teachers who could benefit the most from distributed PLCs, those geographically distant from formal professional development hubs, often face the greatest barriers to participating fully in them.

The promise of PLCs also depends significantly on their quality and sustainability. Superficial collaboration that shares resources without engaging in substantive dialogue about practice offers limited learning opportunities. PLCs require shared commitments to inquiry, norms of respectful challenge and critique, and willingness to make practice visible to others. Analysis of factors influencing effective PLCs using TALIS 2018 data across multiple countries demonstrates that leadership support, organisational structures, and institutional policies significantly shape PLC effectiveness (Christensen & Nielbo, 2024). They also require institutional support through dedicated time, clear purposes, and leadership that values collaborative professional learning. Each of these factors is quite difficult to achieve. Research on transformative professional learning for inclusion reveals that online and on-site learning communities require careful facilitation, sustained engagement, and explicit attention to building trust amongst participants (Brennan & Gorman, 2023). Without these conditions, PLCs can become yet another

mandated activity that teachers perform without genuine engagement or benefit, adding to rather than alleviating their workload.

Technology as Enabler and Complicator

Digital technologies have fundamentally altered the very nature of teacher professional learning. Instructional videos, webinars, online courses, and digital communities provide access to professional knowledge, and teachers can now access expert presentations, peer-reviewed research, and practical teaching resources from anywhere if they have sufficient internet connectivity. This democratisation of access represents a significant shift from earlier eras when professional knowledge circulated primarily through formal channels controlled by institutions and publishing houses. Research on microlearning for teacher professional development demonstrates how the efficacy of adaptable, readily available resources facilitates favourable views towards self-directed and flexible learning (Kohnke, 2024). Yet this abundance creates its own challenges: navigating the sheer volume of available resources, distinguishing high-quality from low-quality materials, and maintaining focus amidst information overload all present obstacles to effective self-directed learning.

The emergence of artificial intelligence tools has introduced new dimensions to this technological landscape. Generative AI platforms can assist with lesson planning, material creation, and instructional design. They offer teachers immediate access to resources that might previously have required substantial time to develop. For teachers working with limited institutional support or heavy workloads, such tools present genuine affordances for enhancing practice. Examination of how beginning language teachers navigate generative AI reveals that whilst some embrace these tools enthusiastically, others express concerns about over-reliance and loss of pedagogical control (Moorhouse, 2024). This variation in teacher responses reflects deeper questions about the appropriate role of AI in professional practice and the balance between efficiency and pedagogical intentionality.

However, the role of technology in professional learning is complex and sometimes contradictory. While digital tools increase access to resources, they simultaneously create new demands. Teachers must develop digital literacy to navigate online spaces effectively, evaluate the credibility of information sources, and make informed decisions about which tools and approaches to adopt. The rapid pace of technological change means that such literacy is not a fixed achievement but requires ongoing development. This encompasses multiple dimensions of what has been termed CALL literacy (Tafazoli & Picard, 2023): understanding which technologies serve which purposes, evaluating digital resources critically, adapting materials to local contexts, troubleshooting technical problems, and maintaining digital wellbeing amidst information overload. The concept extends beyond mere technical skill to encompass pedagogical judgment about appropriate integration, particularly important given the diverse contexts and under-represented voices that shape language teacher professional development globally.

The rapid evolution of AI technologies has intensified these demands. Teachers now navigate an expanding ecosystem of AI-powered tools for language teaching, from automated writing feedback systems to AI conversation partners to content generation platforms. Each brings distinctive affordances and limitations that teachers must understand. Each raises ethical questions about data privacy, algorithmic bias, and appropriate use. Each requires pedagogical decision-making about when and how to integrate technology in ways that enhance rather than diminish learning. Professional development for AI integration cannot follow traditional models of technology training focused on technical operation. Instead, it must support teachers in developing critical frameworks for evaluating AI tools, understanding their underlying mechanisms, recognising their limitations, and making informed pedagogical decisions about

integration. Analysis of teachers' digital competence development through professional learning emphasises that such development requires ongoing, practice-embedded learning rather than one-off workshops (Kohnke, 2024). It demands opportunities for experimentation, reflection, and dialogue with peers navigating similar challenges, situating technical learning within broader pedagogical and ethical frameworks.

As mentioned earlier, access to technology remains profoundly unequal. Teachers in well-resourced schools may have institutional subscriptions to premium platforms, dedicated time for exploring new tools, and technical support when difficulties arise. Their colleagues in under-resourced settings may lack reliable internet connectivity, work with outdated devices, and have no institutional support for technology integration. When professional learning increasingly depends on digital access, these inequalities translate directly into disparities in professional development opportunities. Research examining the digital divide demonstrates that experiences with digital technology shape future relationships with AI tools, creating path dependencies that either enable or constrain future professional learning (Bentley et al., 2024). This structural inequality means that technology-enabled professional development, whilst offering genuine affordances for those with access, risks exacerbating rather than ameliorating existing disparities in professional learning opportunities.

Cultural and Contextual Dimensions of Teacher Agency

Professional development, including self-directed forms, never occurs in a vacuum. Cultural contexts shape what counts as legitimate knowledge, how teachers exercise agency, and what forms of professional learning receive recognition and support. Educational systems with strong hierarchical structures may constrain teachers' perceived authority to direct their own learning. Contexts emphasising standardisation may offer limited space for teachers to pursue individualised professional development pathways. A recent scoping review of teacher agency research in higher education identified five key agentic practices—pedagogical innovation, research engagement, professional learning, curriculum change, and policy influence—whilst noting that cultural and institutional contexts significantly shape which practices receive support (Ngo Cong-Lem, 2024). These contextual variations underscore that teacher agency emerges not from individual will alone but from the interaction between personal intention and structural possibility.

These contextual factors intersect with questions of equity and access. Teachers in well-resourced settings typically enjoy greater opportunities for self-directed professional development. They have access to institutional subscriptions for academic journals, funding for conference attendance, release time for professional reading, and technological infrastructure supporting online learning. As stated above, teachers in under-resourced contexts often lack these advantages, creating systematic disparities in professional learning opportunities. These material conditions matter profoundly: without reliable internet connectivity, adequate time, or institutional recognition, even highly motivated teachers struggle to sustain self-directed professional development efforts. Movements such as Open Educational Resources have pushed for greater accessibility to resources to benefit teachers (Ivone & Robb, 2025). The visibility of abundance can, however, be deceptive. For teachers in bandwidth-constrained or device-poor environments, 'open access' often remains largely symbolic. A proliferation of resources is irrelevant if teachers cannot *download* them, stream them, or remain online long enough to engage with them in meaningful ways (Mullens & Hoffman, 2023). Thus, technology's promise of levelling the field frequently rests on infrastructural conditions that are unevenly distributed.

Language also mediates access to professional development resources. The dominance of English in language teaching research and professional discourse privileges expert English language speakers whilst potentially excluding teachers who work in other languages or who lack advanced English proficiency. Self-directed professional development that relies heavily on English-language resources may inadvertently reproduce linguistic hierarchies and limit whose voices and expertise inform the field. Examining knowledge bases of AI tools across languages reveals significant inconsistencies, with LLMs skewed towards English both linguistically and conceptually, potentially producing output that reflects biases and assumptions inappropriate for diverse contexts (Stockwell & Wang, 2023). Attending to these dynamics requires deliberate efforts to support multilingual professional development resources and recognise diverse forms of professional knowledge, challenging the implicit–albeit somewhat misplaced–assumption that valuable knowledge flows primarily through English-medium channels.

Cultural contexts significantly shape how teachers engage in collaborative professional learning. In certain contexts, self-directed learning may be understood not as individual pursuit but as socially mediated practice involving peer collaboration, respect for more experienced colleagues, and shared responsibility for professional growth. Research on teacher agency in virtual communities reveals how distributed leadership enables teachers to assume leadership roles irrespective of formal positions, with implications for how agency manifests across different cultural contexts (Shal et al., 2024; Wang, 2021). Frameworks that emphasise autonomous, individual learning may poorly capture the relational nature of professional development in such contexts. As a result, recognising diverse cultural expressions of teacher agency enriches our understanding of what self-directed professional development can mean, moving beyond individualistic conceptions to acknowledge how agency operates within social and cultural frameworks that value different forms of professional relationship and learning.

Fostering Teacher Agency in Professional Development

Supporting teacher agency in professional development requires more than simply encouraging self-direction. It demands creating conditions where teachers can exercise meaningful choice about their learning whilst ensuring that such choice occurs within contexts of adequate resources, collegial support, and institutional commitment to professional growth. Research on teacher leadership in virtual communities demonstrates that agency empowers teachers to proactively take control of their learning journey, enabling them to explore areas of personal interest and expertise including knowledge sharing and project initiation (Shal et al., 2024). Yet this empowerment requires institutional structures that recognise and value teacher-led learning rather than merely tolerating it as supplement to formal professional development. Crucially, this implies recognising that “agency” is *situated*, not generic: the degree to which teachers can act agentically is determined by their working conditions. In highly constrained settings, where workloads are excessive, classroom ratios are high, or access to professional learning time is minimal, the invitation to ‘take initiative’ can become burdensome rather than empowering. Without structural relief, calls for agency risk becoming an additional demand placed *on* teachers rather than an affordance created *for* them.

This begins with institutional cultures that value teacher professionalism and expertise and provide teachers with the material support they require. When teachers are treated as knowledge generators rather than merely knowledge consumers, when their insights from practice are recognised as legitimate contributions to professional knowledge, and when they have voice in decisions about professional development, they are more likely to engage actively in ongoing learning. Material support includes dedicated time for professional learning, access to

resources including professional literature and technology, funding for attendance at conferences and workshops, and opportunities for collaboration with colleagues. It also encompasses supporting the development of teachers' capacity for self-directed learning itself. This means helping teachers develop skills in identifying their own learning needs, locating and evaluating resources, planning learning activities, and assessing their own progress (Janes & Che, 2024). Such metacognitive and self-regulatory capabilities do not emerge automatically but can be developed through intentional support and practice. Research on microlearning demonstrates that flexible, adaptable professional development pathways support teachers in developing capacity for ongoing, self-directed learning throughout their careers (Kohnke, 2024). These capabilities represent not simply individual skills, but capacities developed through engagement with supportive structures and communities that model, scaffold, and reinforce self-directed learning practices.

Conclusion: Towards Ecosystems of Professional Learning

Moving forward requires shifting from either-or thinking about formal versus informal professional development towards recognition that effective professional learning emerges from ecosystems incorporating multiple, complementary approaches. Teachers benefit from both structured learning opportunities providing exposure to research-based practices and self-directed inquiry allowing them to pursue questions emerging from their own contexts. They need both access to expert knowledge from outside their immediate settings and opportunities to develop and share their own professional knowledge with peers. Research on digital transformation in education emphasises that successful integration requires sustained attention to professional learning that combines technical skill development with critical and reflective capacities (Luo et al., 2025). This integration cannot emerge from isolated professional development events but requires sustained attention to creating conditions supporting ongoing learning.

Such professional learning ecosystems would include formal workshops and courses offering systematic introduction to particular approaches or content areas. They would encompass ongoing PLCs where teachers engage in sustained collaborative inquiry. They would provide access to curated digital resources enabling self-directed exploration of topics of interest. They would support informal mentoring relationships and peer observation. They would create spaces for reflective dialogue where teachers can think critically about their practice and the contexts shaping it. Analysis of network PLCs demonstrates that effective approaches balance practical learning with reflective engagement, supporting both immediate classroom application and deeper pedagogical understanding (Brennan & Gorman, 2023). This balance proves essential: without practical application, professional learning remains abstract; without reflective engagement, practice becomes unreflective routine.

Creating such ecosystems requires coordination across multiple levels. Individual teachers must be willing to exercise agency in pursuing their own learning whilst also engaging in collaborative professional inquiry. School leaders must create cultures and structures that support both individual and collective professional growth. System-level policymakers must provide resources, time, and frameworks that enable diverse forms of professional learning whilst avoiding prescriptiveness that undermines teacher agency. Research examining school factors related to effective PLCs using machine learning approaches across TALIS data reveals how leadership, organisation, policies, and institutional composition interact to shape PLC effectiveness (Christensen & Nielbo, 2024). These multiple levels interact dynamically: individual agency flourishes within supportive institutional contexts, whilst institutional support proves effective only when it aligns with teachers' authentic professional needs and respects their capacity for self-direction.

Quality within such ecosystems emerges not from standardisation but from shared commitments to evidence-informed practice, critical reflection, and continuous improvement. Rather than mandating particular approaches or resources, quality assurance focuses on ensuring that teachers have access to credible information, opportunities for genuine learning, and support for thoughtful implementation. This requires trust in teachers' professionalism and capacity for sound judgment rather than attempts to control practice through prescriptive mandates. It means recognising that teachers are not deficient technicians requiring remediation but knowledgeable professionals capable of directing their own learning when provided with appropriate support and recognition. Research on comprehensive professional learning for addressing ethical challenges of AI in education demonstrates that effective approaches prioritise teacher agency whilst providing necessary scaffolding and support (Mouta et al., 2024). This balance between autonomy and support, between individual agency and collective learning, characterises professional learning ecosystems that genuinely enable teacher growth.

The articles in this special issue illuminate multiple dimensions of how teachers navigate self-directed and informal professional learning. They document teachers' creative strategies for professional growth amidst resource constraints. They examine how digital platforms and communities enable connection and knowledge sharing across distances. They explore the role of reflection and dialogue in deepening professional understanding. They highlight the importance of cultural responsiveness in recognising diverse pathways to professional development. They attend to the often-overlooked emotional and relational dimensions of teaching that formal training frequently neglects. What emerges clearly is that effective professional development cannot be reduced to a singular model or approach.

Teachers need access to both formal learning opportunities and support for self-directed inquiry. They require individual autonomy and collaborative professional communities. They benefit from expert knowledge and opportunities to develop and share their own professional wisdom. They need practical strategies and space for critical reflection on the purposes and contexts of their work. Research across multiple contexts demonstrates that these elements work synergistically rather than in isolation: formal learning becomes more meaningful when connected to self-directed inquiry, individual learning deepens through collaborative engagement, expert knowledge gains relevance through connection to teachers' own practice-based understanding (Liu et al., 2024; Nguyen et al., 2023). The challenge lies not in choosing between these elements but in creating conditions where they can work in concert.

The path forward lies in building professional learning ecosystems that balance autonomy with support, individual inquiry with collective knowledge-building, and practical strategies with critical reflection. Such ecosystems must be culturally responsive, attending to diverse ways of understanding and enacting professional learning. They must be equitable, ensuring that all teachers, regardless of context or resources, have opportunities for meaningful professional growth. Meanwhile, this commitment must include sustained attention to teachers working in precarious, resource-constrained, and low-connectivity environments, where even the most fundamental conditions for professional learning cannot be taken for granted. If ecosystems are to be genuinely equitable, they must be designed not only to include such teachers but to centre their realities as part of what counts as legitimate professional learning. Most fundamentally, they must be grounded in respect for teachers' professionalism, expertise, and capacity to exercise thoughtful agency in service of their students' learning and their own professional development. Only through such respect, manifested in concrete institutional provisions and practices, can we create conditions where teachers thrive as learners and, consequently, where their students can also flourish.

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