OPEN ACCESS

Australian Journal of Applied Linguistics
ISSN 2209-0959
https://www.castledown.com/journals/ajal/

Australian Journal of Applied Linguistics, 8(4), 103284 (2025)
https://doi.org/10.29140/ajal.v8n4.103284

Developing self-regulation for generative AI through a metacognitive checklist: A case study of an in-service language teacher

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Abstract

Regulatory checklists are widely used in many areas of education and professional development because they can support metacognition and self-regulation, two fundamental processes for lifelong learning, that sometimes occur informally and independently. Owing to its dynamic nature, technology in education fits squarely within the paradigm of continuous, often informal, learning for professional development; consequently, it is useful to foster self-regulation in language teachers. This research reports on a case study of an in-service teacher using a regulatory checklist during training in generative artificial intelligence (AI) for language teaching. The case demonstrates that the checklist aided the teacher in developing proficiency in generative AI, the high-order thinking skills required to work with it and, above all, self-regulation. The case is of interest because the teacher was motivated by practical motivations, rather than theoretical and pedagogical concerns, which explains how she used the checklist; for example, she focused on monitoring rather than evaluation. Implications for teacher training are discussed.

Keywords: Teacher training for technologies, metacognition, self-regulation, generative artificial intelligence

Introduction

The rapid emergence of generative artificial intelligence, hereafter, GenAI, is placing increasing demands on language teachers, who are now expected to engage with tools that require higher-order cognitive processes, such as evaluating output. However, professional development opportunities are often limited or unevenly accessible, especially given the pace at which the field is evolving, making it unlikely that teachers can rely solely on institutional training; self-directed learning (Stockwell, 2025) has therefore become a major option in this respect. Self-directed learning can be facilitated by self-regulation (Loyens et al., 2008; Yang, 2023), which, although not mentioned in discussions about AI literacy (e.g., Sperling et al., 2024), could instead constitute a primary element of AI literacy. Operational tools such as regulatory checklists, may help to enable teachers to develop self-regulation for use in extramural, self-directed, or informal learning. This research focused on how a regulatory checklist can support language teachers in developing self-regulation in their use of GenAI. While teacher AI-literacy discussions frequently emphasize knowledge, ethics, and classroom application, they less often address the self-regulatory processes that enable teachers to learn, troubleshoot, and refine practice under conditions of rapid tool change. This study therefore positions self-regulation not as an optional add-on, but as a plausible core dimension of functional AI literacy for teachers, and examines whether a regulatory checklist can scaffold that dimension during authentic training tasks.

Literature Review

Language Teacher Professional Development and GenAI

The recognised advantages of integrating technology in teaching (e.g., Dzekoe, 2020; Jiang, 2025; Jones, 2014; Zhang, 2023) have made digital literacy a primary necessity for language teachers and the recent spread of GenAI intensified this need (Moorhouse, 2024; Yin et al., 2024). Indeed, GenAI is a versatile technology that allows many uses in different working contexts (Vadhil et al., 2024), including language learning and teaching (e.g., Wu & Dong, 2025). Language teachers are therefore interested in appreciating the potential benefits and drawbacks of this technological breakthrough (e.g., Barnes & Tour, 2025). Not surprisingly, the growing number of publications on the application of GenAI to language learning and teaching (e.g., Chapelle, 2025; Han & Li, 2024; Koraishi, 2023; Law, 2024: Moorhouse et al., 2024) is matched by a similarly expanding body of work devoted to teacher education, cognition and beliefs (Case et al., 2025; Kohnke, 2025; Lee et al., 2025).

Although professional development is important, limited time and other barriers often hinder teachers from participating in formal training (Eroglu & Donmus Kaya, 2021); therefore, it may be useful to devise tools that support teacher development also outside formal training contexts, particularly for self-directed learning. Self-regulation appears paramount for self-directed learning, especially when using a complex tool such as GenAI, which predominantly requires higher-order processes, such as assessing AI-generated output against specific learning objectives.

Because metacognition has proved effective in professional development across various fields, including informal and self-regulated learning (Kittel & Seufert, 2023), it could be used to facilitate teachers' learning about technology both in formal and informal contexts.

Metacognition and Professional Development

Metacognition is often defined as "thinking about thinking" or "knowledge and cognition about cognitive phenomena" (Flavell, 1979, p. 906), that is, the conscious reflection on one's cognitive resources and strategies when performing a task. Because of this reflective role, metacognition is viewed as a major source of empowerment in learning (Medina et al., 2017) and is widely valued across the educational literature (e.g. Graham, 2006; Lee & Mak, 2018; Rahimi & Katal, 2012).

Metacognition is also considered pivotal in teacher professional development (Calderhead, 1987; Mack et al., 2019; Zohar & Lustov, 2018). In the field of Information and Communication Technology (ICT) development, Phelps et al. (2004) argue for a metacognitive, motivation-driven approach, noting that rapid technological change renders traditional, directive forms of training inadequate. They contend that teachers must instead be "more self-directed... [engaging] in self-directed and lifelong computer learning" (p. 52).

There is, indeed, a lengthy line of research on the connection between self-directed learning and metacognition (e.g., Schunk, 2008); however, the two are not equivalent (Zimmerman, 1995). Some authors, like Ertmer and Newby (1996), define "expert learners" as those who exploit metacognition to define and achieve their learning goals. Regulatory checklists constitute one of the most common tools for metacognitive instruction; their purpose is "to provide an overarching heuristic that facilitates the regulation of cognition." (Schraw, 2001, p.11).

Metacognitive Regulatory Checklists

A regulatory checklist is typically organised around the three phases of regulation: planning, monitoring, and evaluating, for each of which it contains specific prompts. For instance, in the planning phase it may contain such questions as "What is my goal?" (from Shraw, 2001), which guide learners, prompt them to control their behaviour, and encourage them to model it on that of experts (Schreiber, 2006).

Regulatory checklists are widely used, especially in professions centred on problem solving, such as language teaching (e.g., Lee & Mak, 2018). Overall, regulatory checklists have proven effective in fostering learner's metacognition and self-regulation (e.g., Chew et al., 2016; King, 1991). This study focuses on how a regulatory checklist is instrumental in supporting the development of self-regulation in the use of GenAI.

In this study, *self-regulation for GenAI* refers to the teacher's cyclical capacity to (a) set a task goal and plan prompting strategies, (b) monitor output quality, relevance, and risk against pedagogical objectives, and (c) evaluate outcomes to inform future strategy choice. This operational definition aligns with Zimmerman's Self-Regulated Learning (SRL) model while acknowledging that GenAI interaction adds domain-specific demands, such as calibrating trust in outputs, diagnosing failure modes, and deciding when further iteration is not worth the time cost.

Research Objective

Research Question

Metacognitive and self-regulatory checklists have been variously used in teacher training (Mali & Salsbury, 2021; Sableski et al., 2019; Sanchez-Ballado, 2025); however, although metacognition has also been applied in teacher training for technologies (see Mei & Yang, 2025), its potential for developing self-regulation in GenAI remains understudied. To begin addressing this gap, this research focuses on how a checklist can support an in-service English teacher learning how to use GenAI. Based on the above premises, the guiding question for the reported research was:

> How does a metacognitive checklist support an in-service language teacher developing self-regulation for learning and using GenAI?

Theoretical Framework

As mentioned above, self-regulation has been found to be a key competence, although best defined as a process (Zimmerman, 2002), in lifelong learning (Van den Boom et al., 2004), and it is unsurprising that Zimmermann's self-regulation framework (2000, 2002) constitutes one of the primary frameworks for studying how teachers integrate technology in education (e.g., Brenner, 2022; Huang et al., 2021; Kramarski & Michalsky, 2009).

In Zimmerman's formulation (2002), SRL refers to feelings, thoughts and behaviours that can be traced in excellent learners, who are "proactive in their efforts to learn because they are aware of their strengths and limitations and because they are guided by personally set goals and task-related strategies" (pp. 64–65). The connections with metacognition are strong: learners with self- regulation, in short, resort to metacognition as a means of organising their learning.

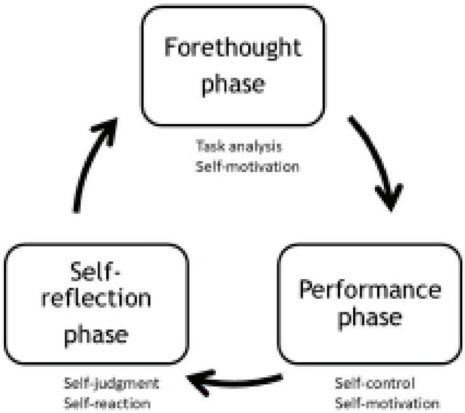

Figure 1. *A visual synthesis of the three phases of the process of self-regulation (from Zimmerman, 2002)*

For analytic clarity, the checklist categories (planning, monitoring, evaluation) are treated as *observable prompts* that elicit SRL subprocesses within Zimmerman's three-phase cycle (forethought, performance, self-reflection). In other words, the checklist provides the *interaction-level scaffolds*, while Zimmerman's model provides the *interpretive lens* for characterising self-regulatory processes evidenced in the data.

On a practical level, SRL is defined as a process (Zimmerman, 2002), comprising three phases, each closely connected with metacognition: forethought, performance and self-reflection (see Figure 1). Each phase comprises two distinct sub-processes. In the forethought phase, learners analyse the task by setting objectives, planning strategies, and activating self-motivation; that is, the beliefs and expectations that can support or hinder learning. In the performance phase, learners activate self-control, deploy the strategies selected during the forethought phase, and engage in self-observation, to check their own performance. In the reflection phase, they evaluate both themselves and their work (self-judgment) and respond to those evaluations (self-reaction). Self-regulation is cyclical: the outcomes of the reflection phase form the basis for the next cycle. For example, if a learner becomes aware of a limitation in a specific skill, this awareness is likely to affect their motivation when working in the same domain in the future.

Materials and Method

Checklist Design

A GenAI for language teaching regulatory checklist was designed to support teachers in developing self-regulation for using GenAI in language teaching. It was based on the three phases of regulation of metacognition (Schraw & Dennison, 1994): planning, monitoring, and evaluation, and can be used in what we shall here refer to as "interaction." An interaction occurs when a language teacher has an objective related to language teaching and resorts to GenAI for any kind of support. An interaction (see Figure 2 for a visual synthesis), therefore, comprises: planning how to prompt the AI; evaluating the quality of the output against the set language-related objectives; deciding whether or not to further query the bot further, for instance, by modifying the prompt or iterating (for example by redefining the context or providing additional information); and, finally, accepting the result. Result acceptance does not imply that the output is considered fully satisfactory, but that it is the best that is achievable within a reasonable amount of time (for example, a teacher might be disappointed by the output and not know how to improve it, or decide that further prompt elaboration is not worth the effort of further elaborating the prompt). When the interaction ends, either successfully or unsuccessfully, the teacher evaluates it.

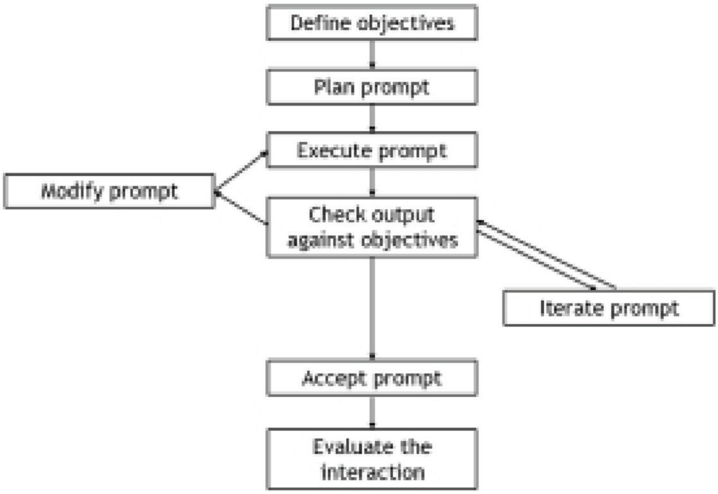

Figure 2. *A visual synthesis of the process of interaction with AI, the unit of analysis adopted in this study*

The checklist (reported in the Appendix) was grounded in several theoretical frameworks aligned with its objectives. The classical model of metacognition by Flavell (1979) provides the checklist's blueprint and backbone. Because prompting can be understood as a writing process, the checklist was also informed by the Flower and Hayes model (1981), which views writing as a recursive process; here, we apply the writer-as-problem-solver logic to prompting. Finally, items were drawn from an AI-literacy framework – specifically Long and Magerko (2020), notably the sections "What can GenAI do?", "How does GenAI work?" and "How should GenAI be used?" (e.g. the item "What problems could arise?") and from prompt engineering literature (e.g., Reynolds & McDonell, 2021). Special care was taken to keep the checklist succinct and agile.

As noted above, trainee teachers were required to complete the checklist every time they interacted with AI, both autonomously and during tutored training sessions. Participants completed the checklist online via Google modules or responded orally during tutored sessions.

Research Design

This study adopts an instrumental case study design (Stake, 1995), in which the selected participant does not constitute an exceptional or extreme case, but rather represents a typical expert figure within the target professional community. The purpose of the case is not to generalise statistically, but to provide an analytically rich illustration of how a regulatory checklist can support a teacher in developing self-regulation when using AI.

We selected an instrumental case study design because the participant is an experienced English teacher, whose profile is worthy of investigation: she can illuminate what an expert practitioner may want from AI and how they approach this technology. Given the novelty of the field, exploring such a typical expert figure helps build a general understanding of how teachers engage with GenAI. This case appears to be informative especially for novice or student teachers, who have different priorities from experienced teachers (Moghaddam & Tirnaz, 2024), often lack substantial classroom experience, and may therefore struggle to evaluate GenAI affordances against a robust pedagogical background. In-service teachers may be more inclined to a realistic assessment of the benefit/cost ratio of using a tool, like a regulatory, which in turn can inform how such tools can be used in teacher training.

As a single case study, this research does not aim to produce generalisable conclusions; nevertheless, it tests the checklist in authentic conditions and provides insights that future research can validate with larger groups of teachers.

The Participant

Florence (pseudonym) is an English teacher at a large secondary nautical school in Northern Italy, where she teaches maritime English. She has long-standing experience in the profession and does not consider herself tech-savvy or an enthusiast. However, as soon as she learnt about GenAI from a colleague, she became interested and requested an agile, practice-oriented, in-depth training course on the subject. In the preliminary interview, she reported having a very limited knowledge of GenAI when she started the training programme and considered it rather a “as a kind of Super-Google, with which one could converse in a very limited way, like question-answer or command-result.”

The participant provided informed consent to take part in this study and to share information and insights about her experience. All data were treated with confidentiality and used solely for academic purposes. The participant read the last version of this paper and was given the opportunity to review and confirm its content.

The Context

During spring 2025, a group of in-service teachers enrolled in a three-week course on GenAI for language teaching and assessment. The course was delivered online and recorded, so that all teachers could participate; materials and tasks were made available in a dedicated Google classroom instance. The course comprised three modules, covering Large Language Models (LLMs) and prompt engineering, designing materials, and assessment with GenAI.

Teachers were provided with a set of scenarios, in which they could use GenAI to tackle specific tasks, for example, one scenario required designing an assessment grid for summary writing. Teachers were asked to prompt an LLM at their choice; Florence adopted Copilot to complete these tasks and to respond to the questions in the checklist after each interaction.

Data Collection

Data were collected via multiple sources:

- Field notes and memos;
- Video-recorded sessions incorporating think-aloud protocols during checklist use;

- Artefacts including checklist responses, transcriptions of interactions with GenAI and AI-generated outputs;
- A preliminary questionnaire;
- Interviews with Florence.

The case study was conducted over a three-week period and consisted of three instructional modules, each lasting approximately one hour. All modules were conducted synchronously via Google Meet and were audio-video recorded. Each module followed a consistent structure, including approximately 20 minutes of content delivery (mainly, prompt engineering), followed by around 40 minutes of scaffolded interactions with AI, based on scenarios. During these activities, the participant engaged in think-aloud protocols while developing prompts with the expert and completing an analytic checklist. In addition, each module included scenario-based tasks to be completed independently between sessions, with the possibility of requesting support through the platform.

In total, 17 AI-mediated interactions were analysed. Of these, nine consisted of oral interactions produced during the recorded synchronous sessions and accompanied by think-aloud data, while eight consisted of written interactions associated with the autonomous tasks and documented through checklist completion. This combination of recorded sessions, think-aloud data, and written artefacts provided a sufficiently dense and traceable dataset to support in-depth qualitative analysis within an instrumental single-case study design.

Data Analysis

Thematic Analysis (TA; Braun & Clarke, 2006) was selected as the method of data analysis because it provides a systematic yet flexible framework for identifying patterns of meaning across diverse qualitative sources; in this case, interviews, checklist responses, and recordings. TA is particularly suitable for exploratory research where the focus is on understanding experiences and is widely used in language education research (e.g., Meirovitz et al., 2022; Zhou & Hou, 2024). The study adopts a realist epistemological stance within the framework of TA (Braun & Clarke, 2006; 2023). Indeed, the aim of this study was not to explore Florence's subjective meanings, but rather, to identify observable patterns in the way she used a regulatory checklist during realistic tasks. The underlying assumption was that, while acknowledging the inherent presence of some interpretative judgment, language and behaviour provide access to practices that can be systematically analysed and represented.

Themes were developed through a flexible and recursive examination of the dataset, guided by the self-regulation framework. Within the educational field, several authors (e.g., Kushnir, 2025; Xu & Zammit, 2020) caution that theme generation should be neither exclusively theory-driven nor entirely emergent, but rather "[a]n integration of inductive and deductive coding reflects a balanced, comprehensive view of the data" (Xu & Zammit, 2020, p. 3). In other words, interpretation is not made to fit theoretical frameworks; instead, scope is retained for the emergence of themes.

Thematic Analysis followed Braun and Clarke's (2006) six-step procedure. First, initial codes were generated inductively across all data sources. In the second phase, codes were collated into preliminary subthemes, with those capturing similar regulatory functions subsequently merged. In the third phase, subthemes were reviewed against the dataset to ensure internal coherence. Where two subthemes described the same move (e.g., "verifying accuracy" and "evaluating model performance"), they were combined into a single theme ("assessing output"). In the fourth phase, themes were refined by defining their scope, naming them, and mapping their relationships to the checklist categories. The final themes represent higher-order patterns in the teacher's use of the checklist. Table 1 illustrates how initial codes were collapsed and merged to produce the final themes.

Table 1. *A sample from the process of thematic analysis*

Initial codes (Phase 1)	Preliminary subthemes (Phase 2)	Review and refinement decisions (Phase 3)	Final themes (Phase 4)
Prompt too basic	Problems caused by insufficient prompt detail	Merged with "need for accuracy" (both refer to quality of prompt formulation)	Task-focused -strategic monitoring
AI output too short/simple	Identifying gaps in AI performance	Merged into broader subtheme on "evaluating prompt effectiveness"	Task-focused -strategic monitoring
Chain-of-thought is too long	Avoiding time-consuming patterns	Combined with "waste of time" (both refer to efficiency concerns)	Efficiency shaping engagement with the checklist

The analytic focus of the study was on identifying observable patterns in the participant's engagement with tasks. While interview data and verbalised motivations were collected through recorded sessions and think-aloud protocols, these data were not analysed as subjective meaning-making in a phenomenological sense. Rather, they were used to contextualise and support the interpretation of recurring patterns observed across tasks and interactions, contributing to analytic triangulation without shifting the focus away from pattern identification.

Coding was conducted by a single researcher. As no multiple coders were involved, inter-coder agreement procedures were not applicable. Reflexive memoing was integrated throughout the analytic process to document coding decisions, emerging interpretations, and reflections on the researcher's positionality in relation to the data. Analytic memos were recorded as in-text annotations and comments within the working documents. This approach allowed analytic decisions and category development to remain closely connected to the data, supporting transparency, traceability, and reflexive control within an instrumental single-case study design.

Results

After collapsing the initial codes, two main themes were identified. First, Florence employs the checklist primarily to assess the technology rather than herself as a learner. Second, her understanding of GenAI brought about a substantial significant redefinition of her priorities in using it.

Focus on the Task, not on the Self

Florence's use of the regulatory checklist reveals a systematic tendency to concentrate on task-related technical decisions (for example, pattern selection) rather than on reflective insights about herself as a practitioner. This confirms a pattern noted in self-regulation research, where teachers' self-related reflection is frequently the weakest component of the cycle (Arvatz et al., 2025; Decorte et al., 2024). A hierarchy of the checklist sections of the checklist may thus be defined, according to the elaborateness of the responses. Table 2 summarises the interaction corpus and indicates which SRL subprocesses were most elaborate across episodes. Given the checklist-driven design of the task, all SRL phases were systematically elicited. The distinction between presence and substantive instances was introduced in the table to capture the depth of articulation of reflective processes.

Table 2. *SRL Subprocesses activated during the interactions*

SRL subprocess	Presence (n = 17)	Substantive instances (n = 17)	Evidence strength
Planning strategies	17	17	Systematic and strong
Self-motivation	0	0	Absent
Self-control	17	14	Strong
Strategies deployment	14	11	Very frequent
Self-judgment	17	6	Present but often minimal
Self-reaction	6	3	Weak

The evaluation phase is the one on which Florence works the least, consistent with her concerns about efficiency (i.e. saving time) and her limited interest in self-reflection. This finding is again in line with other studies in this domain, which report, for instance, teachers limited knowledge of the planning and evaluation phases (Spruce & Bol, 2015). Indeed, her responses are often laconic and underdeveloped:

> Have I fully achieved my goals? If not, why?
>
> *Not fully. I could have done the phrases myself in the same amount of time, although they would have been fewer.*

In this response, it is evident that her real concern is time, which led her to evaluate the tool and its output, rather than to engage in self-reflection. This is further demonstrated by her refusal to answer the second question. Nevertheless, this does not mean the evaluation section was without value in fostering self-regulation: in this instance, it led her to reflect on her needs:

> What do I still need, want, or feel able to improve in my prompt engineering knowledge?
>
> *I need to memorise the prompts [the patterns, Editor's note], so that I don't have to look them up all the time.*

Responses to the planning section of the checklist arguably contain no explicit reference to self-motivation (the subprocess about oneself in the forethought phase of Zimmerman's model) but instead focus specifically on technical aspects. This is particularly evident in the question "What prompt patterns could be useful to me and why?", that compels Florence to connect objectives (a dialogue concerning a maritime incident) with pattern choice ("outline expansion" and "audience persona"):

> What prompt patterns could be useful to me and why?
>
> *Outline expansion, because a dialogue needs to be created from an extant text, and audience persona, as these are supposed to be seafarers.*

Such responses are significant in fostering a critical, self-regulated attitude. Planning is the most challenging phase for Florence, as she reported in an interview:

> *[Planning] is not really difficult, but rather time-consuming and cumbersome, because of all the variables to consider and the material to work on.*

Although planning compels Florence to engage in in-depth reasoning, it remains fundamental to the development of her practical understanding of prompting. This is evident in other responses to the question "What prompts could I use?":

> ["Produce a gap-filling exercise on Present Perfect " interaction]: *(…)"chain of thought" and question refinement, because there were some misunderstandings.*
>
> ["Produce a grid to grade summaries" interaction]: *explaining chain of thought, so as to make sure the assessment will be as "objective" as possible*

Notice that in the interviews, Florence uses the term "chain of thought" to refer to prompts that ask the AI system to make its reasoning explicit. In this study, this expression is treated as participant language and is not intended to imply access to the model's internal reasoning processes.

Consistent with many studies on self-regulation (e.g., Isaacson & Fujita, 2006), the monitoring phase plays a leading role in Florence's development of self-regulation. Responses in this phase are longer and more varied than those in other sections. In one of the earliest interactions, "Produce B2 sentences", for example, it becomes clear that the questions in this part of the questionnaire helped Florence understand the need to write "less basic" prompts:

> Did the *GenAI* follow the instructions given in the prompt? If not, can I say why?
>
> *Not really. As usual, some of the phrases were far too short and simple. Also, whereas I intended for the phrases to be at a University level (so not childish), AI actually set them all within a US campus context.*
>
> Is the pattern I have adopted effective or should I change it?
>
> *I should probably have made my prompts more accurate and less "basic."*

> Can I correct any problems, e.g. by modifying the prompt by integrating another pattern?
>
> *I could provide an example of a very good transformation phrase, and specify that I want British English.*

Self-recording emerges in the first two items: she recognises a problem and begins to self-regulate by noting that her prompts need to be less basic. The final item enables her to move beyond the "velocity at all costs" paradigm and to recognise the value of a more elaborate prompt, such as incorporating examples (few-shot prompting) or specifying the language (the "template" pattern). Research has demonstrated that working with GenAI leads teachers to appreciate the importance of accurate prompting (Moorhouse, 2024), and in this case the checklist supported that process of discovery. In Zimmerman's terms, Florence's work in this section exemplifies the distinction between monitoring (noticing problems in the output) and self-control (acting on that information to modify strategies). The checklist makes this transition explicit: monitoring leads to a strategy-adjustment decision, supporting her shift from mere diagnosis to active regulation.

In the subsequent "Produce a course plan" interaction, conducted together with the expert, the video recording illustrates how the monitoring section of the checklist, when integrated into expert tutoring, can facilitate the other subprocess of the performance phase, namely self-control. After the first prompt, Florence briefly examined the output and realised that the topics were too vague. The expert's intervention, reflecting with her on the checklist proved helpful in leading Florence to exert self-control. More specifically, through the expert's mediation, Florence was able to use the checklist to enact behaviours associated with self-control, such as searching within the course materials for the most suitable pattern and subsequently altering her prompt.

Redefining the Efficiency Trade-Off

Florence's approach to GenAI is practical and goal-oriented. At the beginning of her course, she regarded GenAI as a form of manpower, suitable for performing simple, routine tasks. It should be noted that prior to attending the course she had virtually no experience with GenAI, as indicated in the preliminary questionnaire; she was therefore cautious in relying on this technology. For instance, during an interview she stated that:

> *If I ask, for example, to produce grammar items [structural exercises, Editor's note], it is not because I don't feel capable of doing it, but because I am in a hurry… because I know it can produce many items in a very short amount of time.*

Using GenAI as a form of manpower is a recurring theme in the specialised literature (Bodén, 2023), and Florence clearly identifies with this perspective:

> *If I resort to GenAI in this historical period… in my case, but not only in mine, because I am not the only one, it is not because I cannot do something, but because I'm in a hurry.*

Her responses to the checklist also offer valuable insight into her motivation and attitude towards this tool, confirming her interest in saving time:

> [Planning] What prompt patterns could be useful to me and why?

> *Chain of thought (but it's too long), question refinement (also quite a waste of time), few shot prompting (so, maybe, providing examples). A sort of audience persona (uni students).*

Florence had understood how prompt patterns function; however, she chose not to use some of them because she considered them "quite a waste of time." This pursuit of speed was associated, in the early stages of her training, with simple and extremely succinct prompts, an approach that runs counter to the basic principle of prompt engineering; namely, the need to provide precise and context-rich prompts. Time-saving thus emerges as a key parameter, as illustrated further in the following responses:

> [Evaluation] Have I fully achieved my goals? If not, why?
>
> *Not fully. I could have done the phrases myself in the same amount of time, although they would have been fewer.*
>
> [Evaluation] Was the output produced by the GenAI useful/had a positive effect?
>
> *Yes, because I obtained, in a short time, a large number of phrases to work on. The students didn't really notice that not all the phrases were complex.*

The efficiency trade-off, however, evolved, albeit subtly, over time; in fact, her prompts became progressively longer and more elaborate throughout the experiment. One of the earliest examples was:

> *Please write me a transformation exercise with 10 B2 phrases to be transformed. For university students.*

While later prompts were definitely more detailed, such as the one in the "Produce a course plan" interaction:

> *Please, write me a plan for a 30-hour B2 course. Each lesson lasts 2 hours. The students are between 14 and 20. They all have B1 level. They need to be able to pass the First certificate exam at the end. Lessons need to be on a Wednesday, from 24th September. They should end before June.*

Table 3. *Descriptive overview of the interaction corpus*

Session	Prompts per interaction (mean)	Context details per prompt (mean)	Patterns per prompt (mean)
1	1.5	0.5	0.4
2	2.6	1.7	1.0
3	2.2	3.2	1.2

During the training, she realises that overly simple prompting may not always be effective, particularly when working towards more creative objectives, such as this one. It is noteworthy that Florence brings in several relevant variables here, such as the objectives and duration of each lesson. More importantly, the video recording of the session shows hesitations, second thoughts, and rephrasing in her writing, suggesting the emergence of an awareness of the importance of precise prompting; namely, a shift in her efficiency trade-off towards more elaborate prompts. This is further evident after Copilot's output, which she found unsatisfactory, because it was rather vague. This led her to provide additional context, illustrating once again how monitoring fosters her growing awareness of the need for accuracy:

> *Please, be more specific on focus on B2 topics, and separate skills and activities.*

6	Oct 29	Future forms and prediction strategies	Grammar & Speaking	Sentence transformation, debates, future scenarios
7	Nov 5	FCE Speaking Parts 1 & 2	Speaking	Photo comparison, Q&A circuits, feedback rotation
8	Nov 12	Listening for gist and specific detail	Listening	Audio clips, note-taking drills, gap-fill tests
9	Nov 19	Use of English: word formation & open cloze	Grammar & Vocabulary	Transformation races, suffix/prefix games
10	Nov 26	Writing articles: informal register & tone	Writing	Style swap challenges, brainstorming, peer review

Figure 3. *Copilot's output (Course Schedule)*

This plan, she notes, "could be presented," for instance as a course syllabus. However, she is still not fully satisfied, as the plan generally assigns one skill per lesson, whereas she teaches all four skills in each two-hour lesson. This, again, leads her to provide additional context:

> *In each lesson I work on all 4 skills.*

This ultimately produces what she describes as a "satisfactory" output, in which objectives for all four skills are included in each lesson. A further example of a shift in Florence's efficiency trade-off, emerges in the tutored session, when Florence was interviewed about the possibility of using GenAI to assess texts. She responded:

> *No, no, I would not have it correct homework… maybe if I were in a hurry, I could do it and then check the output.*

The possibility of resorting to AI-supported assessment is, although still rather remote, nonetheless significant, as it would require GenAI to undertake more complex work and it would demand additional time spent interacting for a given task.

Reflecting on her experience, Florence states that the checklist was helpful in developing a deeper understanding of prompting and, consequently, in learning how to perform more elaborate tasks:

> *[The checklist] was essential in this experimental phase. Through it I realised I wasn't prompting GenAI in the most effective of ways: for instance, I didn't ask GenAI to explain how it had reached a given conclusion* [the reasons behind a given output, Editor's note].

Understanding one's limitations is paramount within the self-regulation paradigm, as it provides the basis for self-development and for work in the subsequent self-regulation cycle (see above). However, although Florence found the checklist useful, she perceived it more as a task required during training than as a tool she would feel the need to use in the future, as she explains:

> *The checklist was valuable, maybe a little lengthy (...) I didn't encounter difficulties with it, but I don't think I will use it when I work with AI, if not, maybe, mentally.*

Consistent with her philosophy of efficiency, she finds the checklist "lengthy." Indeed, during the tutoring sessions where the checklist was used orally, in a more flexible manner, and, above all, where she had the opportunity to interact with the expert - her reflections were somewhat deeper and more influential on her work. She confirms this in a later interview: "Yes, it is correct to say that the checklist is more fruitful when used with the expert."

Discussion

A key element that emerges across the two themes (focus on the task and redefinition of the efficiency trade-off) is Florence's concern for time, a feature commonly observed among in-service teachers (Thompson et al., 2024), which consistently shapes her approach towards GenAI. In this regard, Creagh et al. (2025) have recently introduced the term *time poverty*. Notably, the authors go beyond the simple notion of "lack of time" and define time poverty as a subjective experience arising from the combined effect of workload (the amount of work to be completed) and work intensification (the increasing complexity and fragmentation of work), which act as independent yet mutually reinforcing dimensions of temporal pressure. Florence immediately recognises the affordances of GenAI in this context and, as a consequence, the notion of time poverty becomes pivotal for understanding her particular case. It is time poverty (possibly together with an awareness of her consolidated professional experience) that leads her to neglect self-reflection when using the checklist, and it is time poverty that initially drives her preference for plain, rapid prompts.

Florence's limited engagement in reflection operates at two levels within Zimmerman's model. First, her responses in the evaluation phase are consistently brief and descriptive, suggesting low elaboration driven by efficiency concerns. Second, the personal dimension of reflection (self-motivation beliefs within the forethought phase) remains largely implicit, as Florence shows little interest in articulating her self-perceptions as either a learner or a practitioner. This pattern aligns with previous findings showing that teachers' reflection tends to be predominantly descriptive and task-oriented rather than self-evaluative (Arvatz et al., 2025; Greenquist-Marlett et al., 2024; Kistner et al., 2010; Spruce & Bol, 2015). Our case, however, further illustrates how efficiency concerns can suppress self-related reflection also in the other phases; in the monitoring phase, for example, Florence compares the output with her objectives and subsequently adjust her prompts. From the perspective of Zimmerman's model, monitoring enables her to engage particularly in self-observation, a sub-process of the performance phase; specifically, self-recording through the act of completing the checklist. While this pattern resonates with previous findings on teachers' SRL, our case additionally demonstrates how a regulatory checklist can selectively strengthen performance-phase processes while leaving self-focused reflection largely unaffected.

As previously noted, time poverty helps explain Florence's early preference for quick, plain prompts. Training in the use of GenAI naturally led her towards a deeper understanding of this dynamic. This mirrors findings that teachers initially focus on time-saving and routine tasks when adopting GenAI (Bodén, 2023; Mitsumoto & Eguchi, 2023) but move on towards more sophisticated uses as they gain experience (Moorhouse, 2024). In Florence's case, the checklist appears to accelerate this evolution by compelling her to articulate goals, anticipate problems and iteratively refine her prompts. As suggested by Sperling et al. (2024), this development may be interpreted through the lens of the notion of phronesis, understood as "the ability to make thoughtful decisions when it comes to applying both knowledge (episteme) and technical skills (techne) in their teaching." (p. 2). Here, phronesis involves a shift from using GenAI as quickly as possible to attempting to exploit its potential by interacting more deeply and providing more elaborate prompts. As Florence later acknowledges, the checklist accompanied her throughout this process and was "essential" and "valuable" in developing such phronesis. Time poverty, finally, can also help explain why she is unlikely to use the checklist in the future. In line with her efficiency-oriented philosophy, it is unsurprising that she does not foresee employing it beyond the training context. Interestingly, however, she hints at a possible role of the checklist in shaping a self-regulating attitude towards working with GenAI ("maybe I will use it mentally"). This seems to suggest that a tool of this kind may not find application outside formal training and should therefore be leveraged within courses to develop a self-regulation mindset.

When weighing the results of this research, an important limitation must be acknowledged; the checklist, although designed drawing on the relevant literature, was not fully validated. Consequently, the conclusions are not only not generalisable, but must also be regarded as derived from a tool that has not undergone all necessary validation steps.

Conclusions

The reported investigation offers insight into how an experienced English teacher uses a metacognitive checklist in her progression towards developing self-regulation while working with GenAI. As shown, Florence begins with a basic understanding of AI, which evolves over time. The improvement in her ability to write effective prompts and to interact with GenAI in a more elaborate manner accompanies an improvement in her capacity to self-regulate her work and, although this success cannot be attributed to our checklist alone, we can share her acknowledgement that it served as a scaffolding during her training.

Although, like all individual case studies, it is not generalisable, this research provides certain elements that might be worth considering in future teacher training for AI. First, the checklist is not something Florence is likely to use in the future, but it somehow helped her apply a self-regulation mindset to working with AI, something she admits to being likely to continue in the future. Our first suggestion, therefore, is to make explicit, during training, the function of regulatory checklists as tools for developing self-regulation. Explicitly framing checklists as metacognitive scaffolds can help teachers see how each section corresponds to key phases of self-regulated learning (Zimmerman, 2000). Making these functions explicit can prevent checklists from being perceived merely as course tasks and instead highlight their value as tools that may support professional growth. Second, not all sections of the checklist were equally important, with the final section, evaluation, of a lesser interest to Florence. This pattern, as noted, aligns with previous findings showing that teachers tend to prioritise task-related regulation over post-task reflection. In light of these findings, our suggestion is that training should foreground practical, task-oriented applications. However, such practical focus should not preclude the development of self-reflection. Rather, work with tasks can be leveraged as an entry point for fostering reflective processes, for example, by integrating brief, low-pressure reflective prompts into classroom activities. Third, although the checklist proved useful, it supported only a subset of the processes involved in self-regulated learning. This selective impact is consistent with studies showing that structured prompts tend to elicit monitoring and strategic adjustments, but do not always foster deeper metacognitive evaluation unless accompanied by additional scaffolds. For this reason, the checklist should not be considered a stand-alone instrument for the development of self-regulation. Valuable as it can be, it should be complemented with other tools that prompt teachers to articulate their reasoning, such as guided reflection with an instructor or reflective journals.

This experience suggests the potential of supporting metacognition through regulatory checklists, yet, more importantly, it highlights the importance of understanding who uses such tools and how – an understanding that is paramount to their successful integration into professional development.

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Appendix

The Regulatory Checklist

- Planning (before the interaction)
  - What is my goal?
  - What are the features I want my output to have?
  - What problems could arise?
  - Which prompt patterns could I use? Why?
- Monitoring (during interaction)
  - Did the model follow my instructions? If not, can I say why?
  - Were the patterns I used effective or should I change them?
  - Are there any errors or gaps in the output?
  - If there are some errors or gaps, can I amend the prompt or integrate it with another?
- Evaluation (after the interaction)
  - Have I achieved my goals? If not, can I say why?
  - Is the output useful?
  - Have I learnt something new about prompting?
  - What should I improve in prompting?