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Revisiting Learning Presence in the Community of Inquiry Framework: Insights from a Systematic and Meta-analytic Review

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Abstract

Learning presence (LP) has been proposed as a "fourth presence" in the Community of Inquiry (CoI) framework and linked to self-regulation and self-efficacy; however, its conceptualization and empirical relationships remain unclear. To address these gaps, this study conducted a systematic review on the definitions of LP (RQ1) and meta-analysis examining LP's associations with the three established CoI presences, satisfaction, and learning outcomes (RQ2). Guided by PRISMA (Page et al., 2021), we identified 51 studies for the systematic review and 18 studies comprising 103 effect sizes (N = 19,827) for the meta-analysis published from 2010 to 2025. Results indicated that the term "learning presence" is widely used to denote LP and that it is most commonly conceptualized as regulation of learning. Meta-analytic findings revealed strong positive associations between LP and teaching presence (r = .55), social presence (r = .62), cognitive presence (r = .66), learning outcomes (r = .53), and satisfaction (r = .54). Meta-regression analyses revealed no significant moderator effects, except for the educational levels. Overall, this synthesis clarifies the conceptual landscape of LP within CoI research and provides robust evidence of its consistent relationships with key presences and student learning. Future research should pursue clearer conceptual definitions and refinements, more standardized measurement approaches, and greater methodological and reporting rigor.

Keywords: Learning Presence, Learner Presence, Community of Inquiry, Meta-analysis, Systematic Review

Introduction

Due to rapid technological developments, increasing demand for flexible learning pathways, and the expansion of distance education, online and blended learning have become significant components of contemporary education. Unlike face-to-face learning settings, where interaction occurs through physical co-presence and immediate verbal and nonverbal communication, online learning relies on digital platforms to serve as the primary medium for interaction among instructors and learners. As a result, researchers have been working on establishing theoretical frameworks to explain how meaningful learning occurs in digitally mediated environments. One of the most influential frameworks is the Community of Inquiry (CoI), developed by Garrison et al. (1999). The CoI framework suggests that effective online learning occurs through the interplay of three core components: cognitive presence, social presence, and teaching presence, all of which work together to create a collaborative and engaging learning experience. It highlights the importance of purposeful course design, active facilitation, and collaborative engagement in fostering student learning and satisfaction in online settings.

In response to the potential limits in the original CoI framework and the ongoing theoretical refinement, some scholars have proposed the addition of a fourth element: learning presence

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(LP) to the existing CoI framework (Shea & Bidjerano, 2010, 2012; Shea et al., 2014, 2022). Learning presence refers to learners' self-regulatory processes, including goal setting, strategic planning, monitoring, and reflection, which influence how they participate in online learning inquiry. Critics of CoI believe that the existing cognitive presence does not fully capture the metacognitive and motivational processes that enable learners to manage learning in online learning environments. As online learning often requires greater autonomy and self-regulation than face-to-face settings, proponents of the fourth presence state that the new component will help clarify the role of self-regulated learning in sustaining cognitive presence and interacting with teaching and social presence (Shea & Bidjerano, 2012). Additionally, the addition of learning presence would also expand the explanatory power of the new CoI framework by explicitly acknowledging learners' self-regulatory role in online learning environments (Dunmoye et al., 2025).

Despite the substantial body of research related to CoI, findings regarding the magnitude of relationships among cognitive, social, and teaching presence have varied across contexts (Annand, 2011; Armah et al., 2023; Martin et al., 2022; Zhang et al., 2023). Additionally, there is a lack of comprehensive review of how LP is operationalized in existing research and how the fourth presence is associated with the other three components. A systematic review and meta-analysis are therefore needed to aggregate empirical evidence, estimate pooled effect sizes, and clarify the structural relationships among the four presences. Such synthesis can contribute to refining the CoI framework and providing valuable insights for instructional design and online teaching practice.

Literature Review

The Community of Inquiry Framework and Its Theoretical Evolution

The Community of Inquiry (CoI) framework, proposed by Garrison et al. (1999), provides a foundation for meaningful learning in online and blended environments by highlighting the triadic interplay among cognitive, social, and teaching presences. As the core of the CoI framework, cognitive presence (CP) is defined as "the extent to which learners are able to construct and confirm understanding through sustained reflection and discourse" (Garrison et al., 2001, p. 11). As suggested by Garrison and Arbaugh (2007), CP is manifested in learners' ability to reflect, construct, and build meaning through their involvement in reflective practices and phases, including triggering events, exploration, integration, and resolution. Through these phases, learners construct and validate meaning.

Social presence (SP) reflects "the ability of participants to identify with the group or course of study, communicate purposefully in a trusting environment, and develop personal and affective relationships by way of projecting their individual personalities" (Garrison, 2011, p. 34). As suggested by Garrison et al. (2001), SP includes three categories: affective expression, open communication, and group cohesion. As a necessary precursor to CP (Swan et al., 2009), SP plays an important role in the CoI framework. The study by Shea and Bidjerano (2008) identified that SP is an important mediator of the relationship between learners' perception of teaching presence and their evaluation of learning. It also establishes the notion that interpersonal trust and a sense of belonging are necessary for sustained collaborative inquiry, which affects learning outcomes.

Teaching presence (TP) is defined as "the design, facilitation, and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes" (Anderson et al., 2001, p. 5). The purpose of TP, therefore, is to promote CP or SP, or both, with a set of instructional activities, including the designing and organizing of instructional materials, the facilitating of discourse, and the assisting of students with questions (Authors, 2024; Garrison et al., 1999).

Despite its empirical robustness, the original CoI model has been critiqued for under-specifying the learner's internal regulatory processes and personal agency in learning processes (Chang et al., 2025). A significant development is the expansion of the CoI model to include emotional presence (Cleveland-Innes & Campbell, 2012), institutional presence (Zhang & Zhu, 2023), and learning presence (Shea & Bidjerano, 2012). The extension of CoI presences reflects a recognition that learning is multidimensional and that the framework must adapt to capture the complexity of modern environments (i.e., technology-mediated environments), while also acknowledging learners as active agents in constructing their own educational experiences (Chang et al., 2025).

Learning Presence: Theoretical Foundations and Conceptual Ambiguity

In response to a conceptual gap regarding the role of learners within the original CoI framework, LP was introduced as a new element to the revised CoI model (RCoI, Shea et al., 2014). Although the CoI framework consists of TP, SP, and CP as core dimensions of the educational experience, the original framework paid limited attention to how learners actively regulate their own learning processes and exercise their agencies (Richardson et al., 2024; Shea & Bidjerano, 2010, 2012)

As online learning increasingly requires self-direction and metacognitive control, researchers have questioned whether the existing presences sufficiently represent learners' proactive roles in both individual's learning processes.

Shea and Bidjerano (2010) articulated learning presence (LP) as grounded in the socio-cognitive motivational model (Zimmerman & Schunk, 2001) and self-regulated learning theory (Zimmerman, 2008), defining it as learners' self-efficacy, effort regulation, and strategic engagement—factors that contribute to meaningful knowledge construction in online discourse. Later, Shea and Bidjerano (2012) conceptualized LP explicitly as self-regulation and positioned it as a moderator of the relations between SP and CP, and between TP and CP, respectively. Building on these extended CoI models, scholarly attention gears towards the conceptual roles and necessity of LP in the CoI framework. Proponents argue that LP addresses a theoretical gap by explicitly accounting for learners' self-regulatory and metacognitive processes, citing its positive associations with the three established presences and with learning outcomes (e.g., Cho et al., 2017, Na et al., 2024a, b). In contrast, critics contend that LP substantially overlaps with elements already embedded within CP and TP, rendering a distinct fourth presence theoretically redundant (Garrison & Akyol, 2013). More recently, Shea et al. (2022) extended LP to include self-, co-, and shared regulation, framing it as a construct that captures both individual and collective regulatory processes in online learning communities.

Despite these theoretical refinements and ongoing debates, questions remain regarding how LP has been conceptualized and operationalized across empirical research. Empirical studies operationalize LP variously as self-regulated learning (Cho et al., 2017), meta-cognitive strategies (Li & Lau, 2025; Zhang, 2018) and shared meta-cognition (Garrison, 2022), self-efficacy (Chen et al., 2025), motivation (Tunceren, 2017), effort regulation (Shea & Bidjerano, 2010), or a general indicator of learner agency. This fragmented conceptualization of LP has blurred its boundaries with TP, CP, and broadly related motivational constructs, leading to inconsistent theoretical positioning. As a result, LP's role within the CoI framework remains diffuse and insufficiently specified. Therefore, research synthesis is needed to clarify how LP has been conceptualized and to examine its empirical associations with other presences and students' learning.

What We Already Know from Prior Research Syntheses

Over the past decade, a growing body of empirical research on the CoI framework has been consolidated through multiple meta-analyses and systematic reviews. (see Table 1). The finding of the meta-analyses consistently indicates that TP, SP, and CP are strongly and positively associated with students' perceived learning and satisfaction, although the strength of these associations varies. TP and SP tend to show stronger links with satisfaction (Caskurlu et al. 2017; Richardson et al., 2017), whereas CP tends to be more strongly related to perceived learning (Martin et al., 2022; Yang et al., 2025). However, when learning is operationalized as objective performance outcomes (i.e., actual learning), the associations are notably weaker (Martin et al., 2022). This suggests that CoI presences are more closely aligned with students' subjective learning experiences. While prior syntheses have solidified the empirical standing of the original triadic model, they largely overlook developments introduced in the revised CoI framework. In particular, the positioning and empirical role of LP remain underexamined.

To address this gap, Chang et al. (2025) conducted the first systematic review focused exclusively on LP within the revised CoI framework (2010–2024), synthesizing 26 quantitative studies. Their review positions LP as a critical presence representing learners' regulatory learning processes and cognitive engagement. Further, LP has been conceptualized as a mediator or moderator in the relations to TP, SP, and TP, and, like these three presences within the CoI framework, shows positive associations with learning outcomes, engagement, and satisfaction. However, the strength of these associations substantially differs across cultural (e.g., individualist vs. collectivist), instructional (e.g., blended vs. fully online), and educational (e.g., K–12 vs. undergraduate) contexts.

Despite its valuable contributions, Chang et al. (2025) included only studies employing standardized survey measures. While this systematic review of LP (Chang et al., 2025) was an important contribution, it excluded a substantial body of CoI research grounded in content analyses of interviews, discourse in online setting, and discussion transcripts. Given the longstanding tradition of qualitative inquiry within CoI research, this methodological restriction offers a limited view of how LP has been conceptualized. Moreover, their conclusions regarding LP's relations with other presences and learning outcomes were based on selected correlations from representative studies rather than a quantitative synthesis of all available effect sizes, limiting the precision and generalizability of their findings.

Table 1

Previous Research Syntheses on the CoI Framework

Publication	Articles	Research Scope and Key Findings
Richardson et al. (2017)	25 articles (1992 ~ 2015)	Meta-analyses on relations between SP and perceived learning and satisfaction ● SP and satisfaction: $r = .56$ ($p < .001$; $k = 26$); course length, disciplinary areas, and measurement scale are significant moderators. ● SP and perceived learning: $r = .51$ ($p < .001$; $k = 26$); course length, disciplinary areas, and target sample are significant moderators.
Caskurlu et al. (2020)	30 articles (1997 ~ 2018)	Meta-analyses on relations between TP and perceived learning and satisfaction ● TP and satisfaction: $r = .59$ ($p < .001$; $k = 26$); course length, disciplinary areas, and scales are significant moderators. ● TP and perceived learning: $r = .60$ ($p < .001$, $k = 23$); target sample and course length are significant moderators.
Martin et al. (2022)	19 articles for meta-analysis and 55 articles for systematic reviews (2000 ~ 2019)	Meta-analyses on relations between three presences (TP, CP, and SP) and actual and perceived learning and satisfaction. ● TP and actual learning: $r = .35$ ($p = .001$, $k = 6$); perceived learning: $r = .39$ ($p < .001$, $k = 10$); satisfaction: $r = .51$ ($p < .001$, $k = 10$) ● SP and actual learning: $r = .20$ ($p = .042$, $k = 6$); perceived learning: $r = .43$ ($p < .001$, $k = 10$); satisfaction: $r = .45$ ($p < .001$, $k = 10$) ● CP and actual learning: $r = .25$ ($p < .001$, $k = 6$); perceived learning: $r = .66$ ($p < .001$, $k = 10$); satisfaction: $r = .59$ ($p < .001$, $k = 10$)
Yang et al. (2025)	32 articles (~ 2024)	Meta-analyses on relations between CP and perceived learning and satisfaction ● CP and satisfaction: $r = .63$ ($p < .001$; $k = 42$); disciplinary areas, course length, and scales are significant moderators. ● CP and perceived learning: $r = .69$ ($p < .001$; $k = 27$); disciplinary areas, course length, and scales are significant moderators.
Chang et al. (2025)	26 articles (2010 ~ 2024)	Synthesize quantitative research on LP within the RCoI framework. ● Focused on demographic and educational context, measurement of LP, methodological aspects of validating LP ● Cultural background, educational level, instructional modalities, and individual differences may affect LP itself, as well as its relationships with learning outcomes and other presences within the CoI framework.
Krebs-Lazendic et al. (2026)	10 articles (2010-2022)	Critical analysis exploring TP (i.e., synchronous instructor presence) and its impact on students' learning ● Course grades and distributions, educational levels, course domains, synchronous components, course delivery. ● Lack of adequate statistical reporting for effect size estimation and limited methodological rigor.

Note. TP = teaching presence, SP = Social presence, CP = Cognitive presence, RCoI = Revised Community of Inquiry framework, *k* = the number of effect sizes. *k* = the number of effect sizes

The Present Study

Throughout the past decade, research on LP within the CoI framework has expanded, yet it remains conceptually fragmented across literature. While a recent systematic review of LP (Chang et al., 2025) has emerged, its restrictive selection of primary studies limits a holistic understanding of how LP has been conceptualized. Moreover, variability in LP has been illustrated through correlations drawn from representative studies rather than synthesized average effect sizes, leaving its overall empirical magnitude unclear. Like other Online, Distance, and Digital Education (ODDE) reviews, there is also a need to improve the transparency of search, screening, coding, and analyses steps as well as account for data that are nested. To address these gaps, the present study conducts a qualitative systematic review and quantitative meta-analysis to clarify LP's theoretical positioning and empirical associations using Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA, Page et al., 2021) guidelines. Specifically, we examine two research questions:

RQ1: How has LP been defined and conceptualized in empirical research grounded in the CoI framework?

RQ2: What is the magnitude of the associations between LP and other presence (i.e., TP, SP, and CP) within the CoI framework, as well as student learning outcomes and satisfaction? To what extent do educational level, research location, and instructional modality moderate the association between LP and other presences?

By synthesizing and quantifying the existing evidence, this study contributes theoretically by sharpening LP's role within the CoI nomological network and methodologically by estimating pooled effect sizes and heterogeneity. Furthermore, the findings are expected to help identify which learning processes need more scaffolding in online and blended learning settings, thereby informing evidence-based design decisions.

Methods

This study followed the PRISMA guidelines to ensure transparency in search, screening, coding, and analytic procedures. Where relevant, and unless specified otherwise, we used a random effects model and set statistical significance thresholds to $p < .05$. Our choice of random effects is driven by the heterogeneity in samples and measurement approaches used to assess LP. This approach assumes that true effect sizes vary across studies and allows for generalization beyond a single underlying population effect.

Literature Search

In the literature search phase, we conducted systematic searches for conceptualization and meta-analyses of learning presence within the Community of Inquiry (CoI) framework. We searched multiple databases, including Education Source, ERIC, and APA PsycINFO (via EBSCOhost), as well as the Education Database and Dissertations & Theses (via ProQuest). The literature search was conducted in November 2025 and used the following search terms in the

title, abstract, and keywords: “Community of Inquiry” AND (“learning presence” OR “learner presence” OR self-regulate* OR co-regulate* OR effort regulation OR self-efficacy OR self-direct*). Further, given that the concept of learning (or learner) presence was proposed in 2010 (Shea & Bidjerano, 2010), we set the search period from 2010 to 2025. All detailed DB quires are available in Supplementary Material.

As part of an extended search strategy, we conducted a backward snowball search of recent reviews (e.g., Chang et al., 2025) to manually identify additional studies. A total of 408 records were identified through the database search and 8 records through the hand search, yielding a total of 416 records.

Screening of the Studies

We used Covidence to import the searching results and then removed duplicate. After removing all duplicates (n = 217), 199 records remained. During the screening phase, we employed a two-step process to assess study eligibility using Excel: (a) title and abstract screening, followed by (b) full-text screening. In the title and abstract screening phase, we excluded 46 records that did not meet the inclusion criteria (see Table 2): (a) written in English; (b) reporting empirical evidence; (c) examining learning (or learner) presence as a focal variable or topic; (d) targeting learners as the sample; and (e) conducted in online learning settings. The full text of two studies could not be retrieved. During the full-text screening phase, we excluded an additional 100 articles for the following reasons: lack of topic relevance (i.e., LP was not examined as a focal variable; n = 87), inappropriate target sample (e.g., instructional designers or faculty rather than learners; n = 6), and in-person learning settings (e.g., VR, n = 3), the same study published in different formats (n = 3), no empirical study (n = 1). Consequently, 51 studies were included in the final analysis for the systematic review (RQ 1).

For the meta-analysis (RQ 2), we further restricted the sample to studies reporting correlations between LP and other presences (i.e., TP, SP, and CP), as well as learning outcomes and satisfaction, resulting in 24 eligible studies. However, several studies did not report sufficient statistical information required for effect size calculation. Accordingly, we contacted corresponding authors (n = 8) to request the necessary information when only a single element (e.g., sample size or non-significant correlation values) was missing, and we received responses from two authors (Li & Lau, 2025; Usmani, 2021). If the authors did not respond or were unable to provide sufficient information, the corresponding outcomes with missing data were excluded from meta-analysis. The final meta-analytic dataset comprised 103 effect sizes across 18 studies (see Figure 1).

Table 2

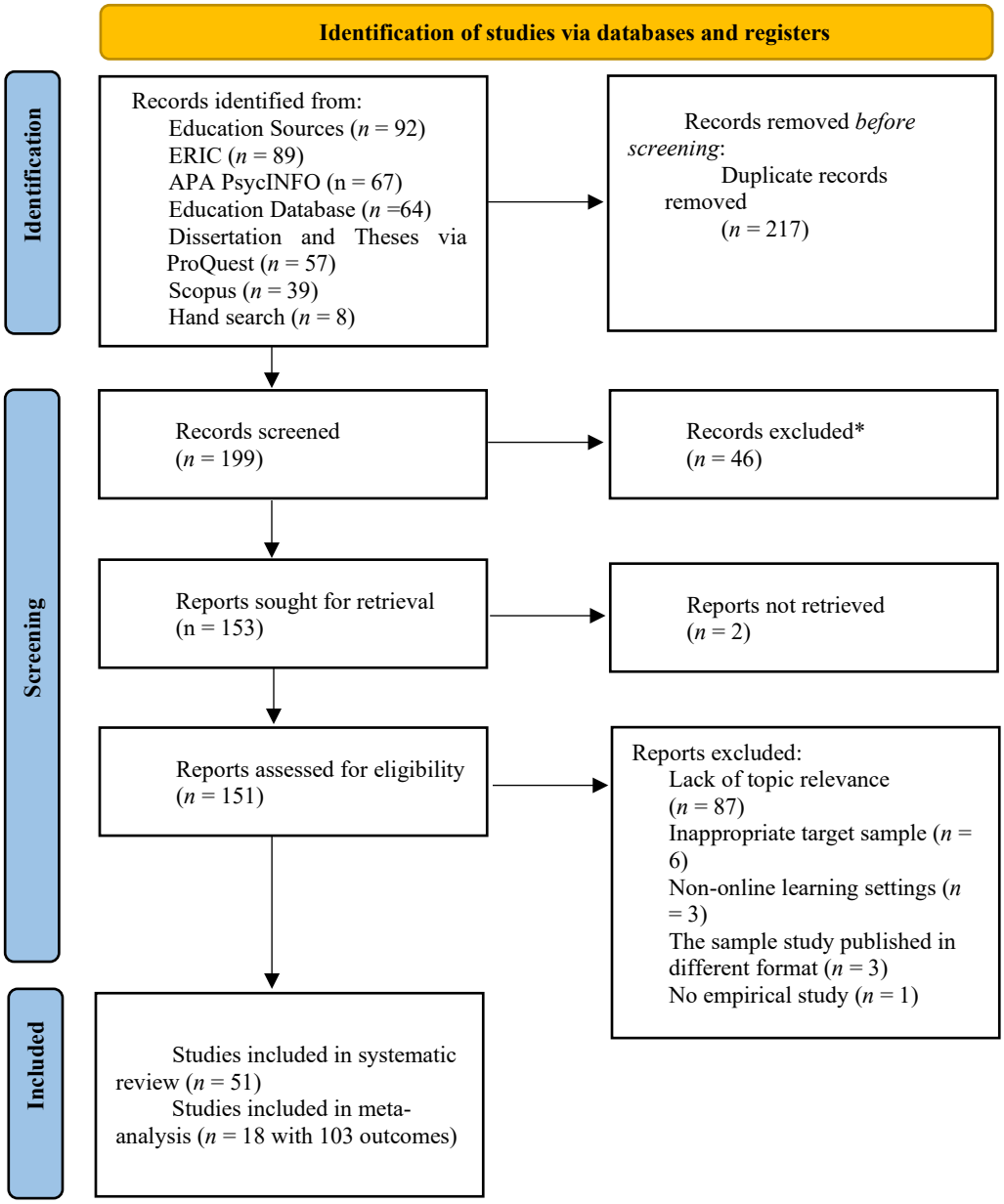
Inclusion and Exclusion Criteria

	Inclusion Criteria	Exclusion Criteria
Language	The study was written in English.	The study was not written in English.
Publication year	The study was published between 2010 and November 2025 (the period during which the research team conducted the search)	The study was published before 2010.

	Inclusion Criteria	Exclusion Criteria
Research type	The study included empirical evidence (e.g., quantitative, qualitative, or mixed-methods research) examining LP	The study did not include empirical evidence (e.g., systematic reviews such as Chang et al., 2025, or position papers such as Shea et al., 2022).
Topic relevance	The study explicitly mentioned LP was used as focal variables or topics in the study.	The study focused on LP-related variables (e.g., self-regulation, motivation, self-efficacy) but did not frame them explicitly as LP.
Target sample	The study targeted learners as the sample (e.g., undergraduates in online settings or pre-service and in-service teachers in professional development contexts).	The study did not target learners as the sample (e.g., instructors or other stakeholders of online courses).
Research Context	The study was conducted in online learning settings, including fully online, blended (or hybrid), flipped, or MOOC environments.	The study was not conducted in online learning settings (e.g., 100% face-to-face or VR settings).

Figure 1

Flow Diagram of the Search and Selection Procedure for Studies



Coding Procedures

After selecting the eligible studies, we extracted information from each study based on the following categories: (a) publication information, (b) LP conceptualization, (c) methodological characteristics, and (d) research context. Prior to coding, the first and second authors developed the coding scheme deductively based on information extracted from the included papers. Both raters independently double-coded all studies. For variables that could be coded nominally (e.g.,

research methods), interrater reliability (IRR) was calculated using Cohen's kappa. Coding disagreements were resolved through discussion and consultation with the third author.

For categories requiring qualitative coding (e.g., LP conceptualization), we adopted a multi-stage qualitative analysis approach. Qualitative data, such as authors' definitions and descriptions of LP, were analyzed using an inductive thematic coding process. First, the first author extracted relevant text segments (vignettes) describing LP from each study. Two researchers then independently reviewed these excerpts and generated preliminary codes based on recurring patterns in how LP was conceptualized. Through iterative discussions, similar codes were refined, merged, and organized into broader conceptual categories.

For example, studies defining LP as learners' ability to monitor, regulate, and manage their own learning processes were coded as self-regulation (e.g., Na et al., 2024b), whereas studies emphasizing shared regulation among team members were coded as "co-regulation" (e.g., Kim et al., 2022). Likewise, studies describing LP as learners' confidence in their ability to engage in learning activities were coded as self-efficacy (e.g., Alsayer, 2025). The resulting coding framework consisted of multiple codes organized into broader conceptual categories. After consensus on the coding framework was built, two researchers (first and second authors) independently coded a subset of studies and discussed discrepancies until agreement was reached. The final categories reported in Table 3 represent themes that emerged from the qualitative analysis. Inter-rater reliability was assessed using percent agreement, and coding disagreements were resolved through discussion and consultation with the third author. Table 3 provides a description of the coding schemes and the agreement levels for each coding category. To understand the landscape of empirical research on LP, we synthesized the included studies in narrative ways.

As variables associated with LP, we included the three presences of the CoI framework (i.e., TP, SP, and CP), as well as learner-related outcomes that have frequently been used in prior CoI meta-analyses (e.g., Caskurlu et al., 2020; Richardson et al., 2017), namely satisfaction and learning outcomes. Drawing on Martin et al. (2022), we further distinguished learning outcomes into perceived learning (e.g., perceived progress in Zhang, 2018) and actual learning (e.g., GPA in Alotebi, 2017) for the supplementary analyses.

Meta-Analysis Procedures

Calculation of Effect Sizes

To answer RQ2, we coded for effect sizes between (a) LP and other presences (i.e., TP, SP, and CP) within the CoI framework, including others that some authors expanded into and (b) LP and learning outcomes. Zero-order correlations (i.e., Pearson's r) were used as the primary effect size measure. When a study reported Spearman's ρ as the correlation coefficient, we converted it to Pearson's r using Moran's (1948) approach (e.g., Ma et al., 2017; Shea et al., 2014). We derived model-implied correlations from the standardized loadings and included them in the analysis (e.g., ElSayad, 2023; Wertz, 2022).

Pearson correlation coefficients were converted to Fisher's z values (i.e., r-to-z transformation) to stabilize variance and make the distribution normal (Cohn & Becker, 2003).

The first and third authors independently coded the statistical information necessary for calculating effect sizes from 30% of the included studies. Inter-rater reliability was substantially high (ICC = .82) and the first author proceeded with solo coding for the remaining 70%. Guided by Cohen (1988), we considered $r = .10$ as a small effect, $r = .30$ as a medium effect, and $r = .50$ or above as a large effect.

Model Selections

We estimated separate meta-analytic models for each variable (i.e., TP, SP, CP, satisfaction, and learning outcomes). This is because these constructs are theoretically distinct and may vary in their associations with LP, heterogeneity, and effect size distributions. When a study reported multiple correlations derived from the same sample, statistical dependency among effect sizes arose. Ignoring such dependency can lead to biased standard errors and distorted parameter estimates. To address this issue, we applied *correlated and hierarchical effects models*, combining multilevel meta-analysis with robust variance estimation (RVE), which accounts for within-study dependence among effect sizes (Pustejovsky & Tipton, 2022). To impute covariance structure for RVE, we assumed an intercorrelation of $\rho = .70$ among effect sizes within studies. After estimating the pooled effects, we back-transformed Fisher's *z* values to Pearson's *r* for interpretation.

Table 3

Coding Information and Inter-Rater reliability

Coding	Descriptions	Agreement Levels
Publication information		
We extracted author names, title, publication years, publication status (i.e., published or gray) from each study.		100% ($\kappa = 1.00$)
LP conceptualization		
How the paper referred to LP	We coded the terminology used in each study to refer to LP (e.g., Learning presence, Learner presence or others)	82.3%
How the paper conceptualized LP	We coded conceptual framing of LP (e.g., SRL, co-regulation, self-efficacy, motivation) in each study.	80.3%
Methodological characteristics		
Research methods	We coded the research methods used in each study. The research methods were coded into three categories: quantitative, qualitative, and mixed methods.	94.1% ($\kappa = .91$)
Data source	We coded the primary data source(s) used in each study, including surveys, interviews, and discussion transcripts.	78.4%
Measures	We coded the measurement approach used in each study, specifying the coding scheme for qualitative studies (e.g., Shea et al., 2012) and the instrument name or survey tool for quantitative studies (e.g., OSLQ in Barnard et al., 2009).	82.3%
Research Context		

Coding	Descriptions	Agreement Levels
Sample size	We coded the sample size for each study, including the number of participants in quantitative studies and the number of postings analyzed in qualitative studies.	86.3%
Educational level	We coded the educational level of the participants. ● Informal learning: participants were not enrolled in formal education programs, even though learning was delivered in an online setting ● Undergraduate: participants enrolled in undergraduate programs (or community college program) ● Graduate: participants enrolled in master's or doctoral program ● Post-secondary: participants were from higher education settings but did not clearly distinguish between undergraduate and graduate levels. ● K-12: participants enrolled in K-12.	86.3% (κ = .78)
Instructional modality	We coded the educational setting of each study, specifying whether it was conducted fully online, blended, and mixed. ● Online: Instruction delivered fully through online platforms ● Mixed: Instruction that included both online and blended in the study ● Blended: Instruction intentionally designed to integrate online and face-to-face components (e.g., hybrid formats).	96.1% (κ = .93)
Research location	We coded the geographic location of each study and categorized it into Asia, North America, or Africa.	100% (κ = 1.00)

Note. IRR = inter-rater reliability (Cohen's κ) for categorical variables and agreement levels (%) for qualitative variables.

Heterogeneity of Effect Sizes

We assessed heterogeneity among effect sizes using Cochran's Q test and the τ^2 statistic. The Q test evaluated whether the observed variability in effect sizes exceeded what would be expected from sampling error alone, with a significant Q indicating the presence of heterogeneity. Given that the Q statistics are sensitive to the number of studies included, we also reported τ^2 to quantify the within- and between-study variance in true effect sizes, which means the extent of heterogeneity that cannot be explained by sampling error alone (Borenstein, 2023). Further, I^2 was reported to indicate the ratio of true heterogeneity to the observed total heterogeneity (Higgins & Thompson, 2002).

To examine potential sources of heterogeneity, we conducted mixed-effects meta-regression analyses in which educational level, research location, and instructional modality were entered simultaneously as moderators in the same model. Drawing on prior systematic reviews suggesting that the magnitude of LP's associations with other presences may vary across cultural, educational, and instructional contexts (Chang et al., 2025), these three variables were included as theoretically informed moderators. Instead of traditional sub-group analyses (i.e.,

multiple single regressions), entering them concurrently (i.e., a single multiple regression) allowed us to estimate their unique effects while controlling the influence of the other moderators. For research location, only one study was classified as originating from Africa (ElSayad, 2023). To avoid unstable parameter estimates and potential overinterpretation based on a single case, this effect size was excluded from the meta-regression analyses.

Publication Bias

Lastly, we employed multiple approaches to evaluate potential publication bias. First, we visually inspected funnel plots, where symmetry suggests the absence of publication bias. Next, we performed Egger's regression test to statistically evaluate funnel plot asymmetry, with a significant result indicating potential small-study effects or publication bias. All analyses were conducted in R using the *metafor* package with restricted maximum likelihood (REML) estimation (Viechtbauer, 2010) and *clubSandwich* (Pustejovsky, 2026) packages in R (version 4.4.2, R core team, 2025).

Results

Overview of Selected Studies

All 51 studies identified and included in this review study were included in the systematic review, and 18 of them were further analyzed in the meta-analysis because of the quantitative elements reported in these studies. With respect to research design, quantitative studies constituted the largest proportion of the included literature (n = 27, 52.9%), followed by qualitative studies (n = 13, 25.5%) and mixed-methods studies (n = 11, 21.6%).

An analysis of the publication years reveals that these 51 studies were published across 14 distinct years between 2010 and 2025. Between 2010 and 2015, publication frequency was initially low and sporadic (1–3 studies per year), reflecting the early development of the field. A sharp increase occurred in 2017 (n = 7), representing the highest output during the early expansion phase. Although publication counts fluctuated between 2018 and 2020, research activity remained consistently higher than in the initial period. From 2023 to 2025, publication numbers stabilized at six studies per year, suggesting sustained scholarly interest and increasing consolidation of CoI.

Among the 51 studies included, two were conducted in multi-country contexts. Specifically, Xu (2019) reported a mixed participant sample drawn from several countries. Similarly, Kurek (2019) collected data from participants in both Germany and Poland. The remaining 49 studies were conducted within a single country/region. Among these, the majority were conducted in the United States (n = 19), followed by China (n = 9). South Africa contributed three studies, while Ghana, Turkey, Greece, the United Kingdom, and Egypt were each represented by two studies. All remaining studies were conducted within a single county/region, including Germany, Italy, Korea, Pakistan, Romania, Saudi Arabia, Singapore, and Hong Kong. Overall, the evidence base is heavily concentrated in the United States and China, with comparatively limited representation from other regions.

With respect to participant educational levels, the majority of studies focused on undergraduate populations (*n* = 26), accounting for approximately 51% of the sample. A smaller number examined mixed populations across levels (*n* = 11) or graduate students (*n* = 9). In contrast, relatively few studies were conducted in K–12 settings (*n* = 3) or informal learning contexts (*n* = 2). Overall, the distribution indicates a strong emphasis on higher education contexts, particularly undergraduate students, with limited representation of K–12 and informal learning environments.

RQ1: Conceptualization of LP

As a way of conceptual analysis, we examined (a) the terminology used to refer to LP, (b) how LP was conceptualized, and (c) which instruments or coding scheme were used to analyze LP across empirical studies. We first analyzed the terminology used to refer to this construct. As shown in Figure 2, the majority of studies explicitly adopted the term *learning presence* (n = 43) and *learner presence* (n = 6). Moreover, a range of alternative terms were used to describe conceptually related phenomena, including *language learning presence* (*n* = 1, Fayram, 2017) and *self-regulated learning presence* (*n* = 1, Shu et al., 2025).

While this variation in terminology suggests surface-level differences, a deeper examination reveals that much of the conceptual divergence centers on whether and how LP is anchored in frameworks of learning regulation at the individual level. Of the total corpus, six studies did not mention any form of regulation, whereas the majority (*n* = 45) explicitly referred to self-regulated learning (SRL). However, even among those 45 studies, a few studies (Chandler, 2021; Hayes et al., 2015; Kim et al., 2014; Usmani, 2021; Zheng et al., 2023; Zou & Jiang, 2025) explicitly conceptualized LP as a form of co- and socially shared regulation.

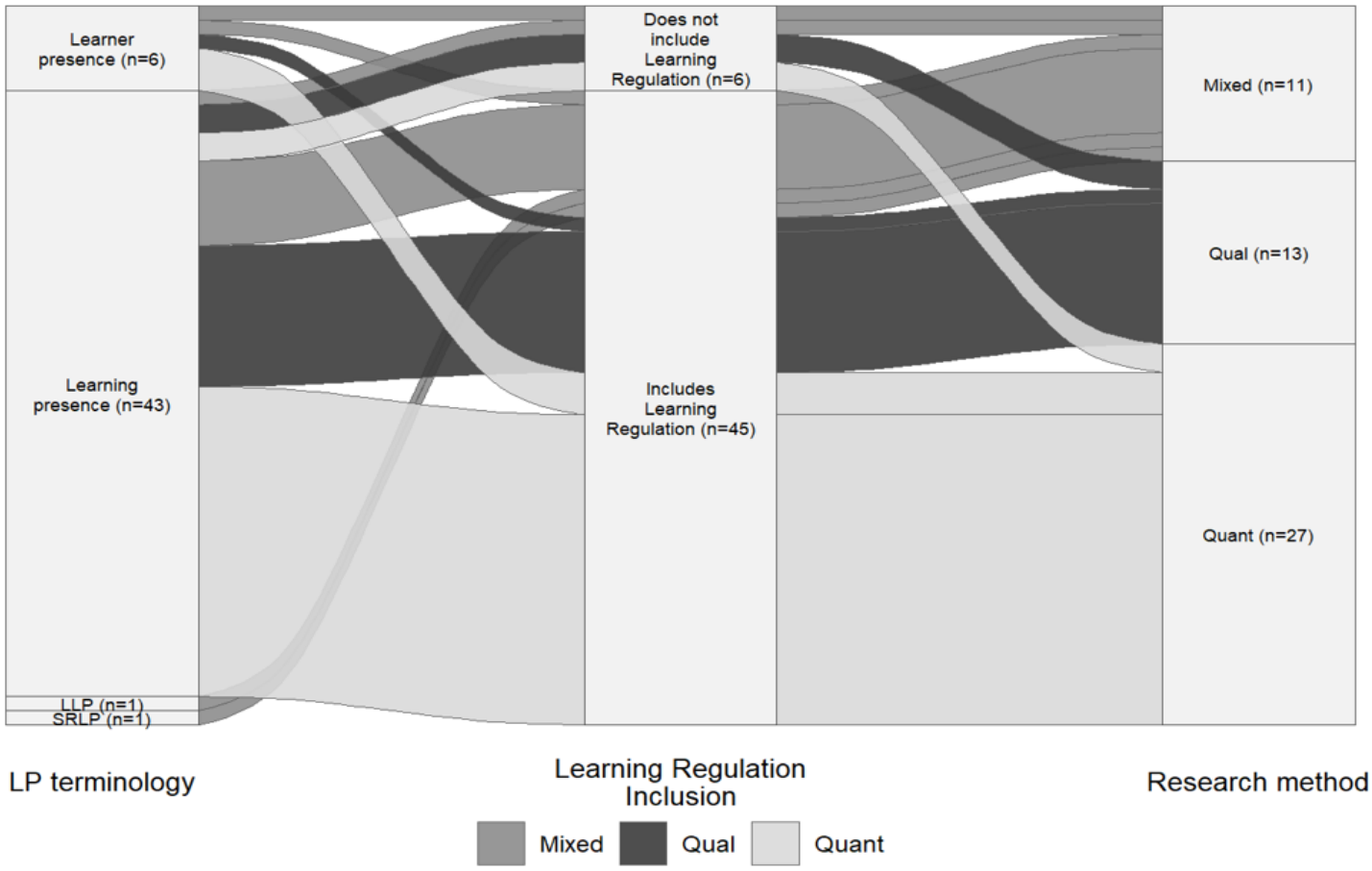
The remaining studies that framed LP beyond SRL perspectives adopted diverse conceptualizations. For example, Xu (2019) and Bosch (2022) explicitly used the term *self-directed learning* to describe LP. Alsayer (2025) conceptualized LP primarily in terms of self-efficacy. Similarly, Gunbatar (2021) interpreted LP as reflecting motivational dimensions, including self-efficacy, general motivation, and changes in study habits, based on coded student interview data. Finally, Volchok et al. (2018) operationalized LP using two behavioral indicators, including scores on extra credit assignments and scores on the first online quiz. Together, these findings illustrate somewhat conceptual heterogeneity in how LP has been defined. Nevertheless, even these varied conceptualizations largely remain at the individual level.

To further examine how LP has been measured and coded from a learning regulation perspective, we categorized the 45 studies into research paradigms for further analysis (see Figure 2). In quantitative research, most studies employed surveys to capture LP through various instruments such as the MSLQ (Pintrich et al., 1993), the OSLQ (Barnard et al., 2009), learning presence measures used by Shea and Bidjerano (2010), WebTalk (Wertz, 2022), or researcher-developed measures. In qualitative research, many studies examined students' online interaction logs, discussion posts, and interview data, drawing on theoretical perspectives of SRL or co-regulation. The majority of coding schemes of LP were rooted in Zimmerman's SRL framework, operationalizing regulation through four phases such as forethought and planning, monitoring, strategy use, and reflection. Several studies adopted the coding definitions introduced by Shea et al.'s (2014) operational definitions, whereas others refined and modified them to align with their

particular research contexts (e.g., Blain 2019). All detailed coding results are available in Supplementary Material.

Figure 2

Distribution of LP Terminology, Learning Regulation Inclusion, and Research Methods Across Included Studies



Note. LLP = language learning presence, SRLP = self-regulated learning presence, Mixed = mixed method design, Qual = qualitative research design, and Quant = quantitative research design.

RQ2. Meta-Analysis of LP

Whereas RQ1 examined LP from a conceptual perspective, RQ2 quantified the extent to which LP is associated with other presences, as well as its relations with learning outcomes and student satisfaction. The 18 studies included in the current meta-analysis comprised 103 correlation coefficients based on 19,827 individual students. Compared to learning outcomes and satisfaction, TP, SP, and CP were more frequently examined in relation to LP. Given the limited number of effect sizes available for satisfaction ($k = 6$) and learning outcomes ($k = 9$), meta-regression analyses were restricted to the relations between LP and the other presences within the CoI framework, with educational level, research location, and instructional modality entered as moderators.

Outliers

In the present analysis, we identified one extremely high correlation coefficient. Notably, ElSayad (2023) reported a correlation of $r = .95$ between the latent variables of LP and CP. Sensitivity analyses indicated that excluding this data point resulted in a meaningful change in the magnitude of the CP–LP relations ($\Delta r = .04$). Therefore, we excluded this effect size from the final analysis.

Publication Bias

Publication bias was examined using visual inspections of funnel plots (see Figure 3) and Egger's regression tests with cluster-robust variance estimation (see Table 4) with mixed results. Visual inspection of the funnel plot showed that the distribution of effect sizes was slightly asymmetric across all five models, indicating possible publication bias. However, as shown in Table 4, the regression coefficients via Egger's test (SE as a predictor) were not statistically significant across the five models, indicting no publication bias. Our conclusion is that the findings should be interpreted cautiously.

Table 4

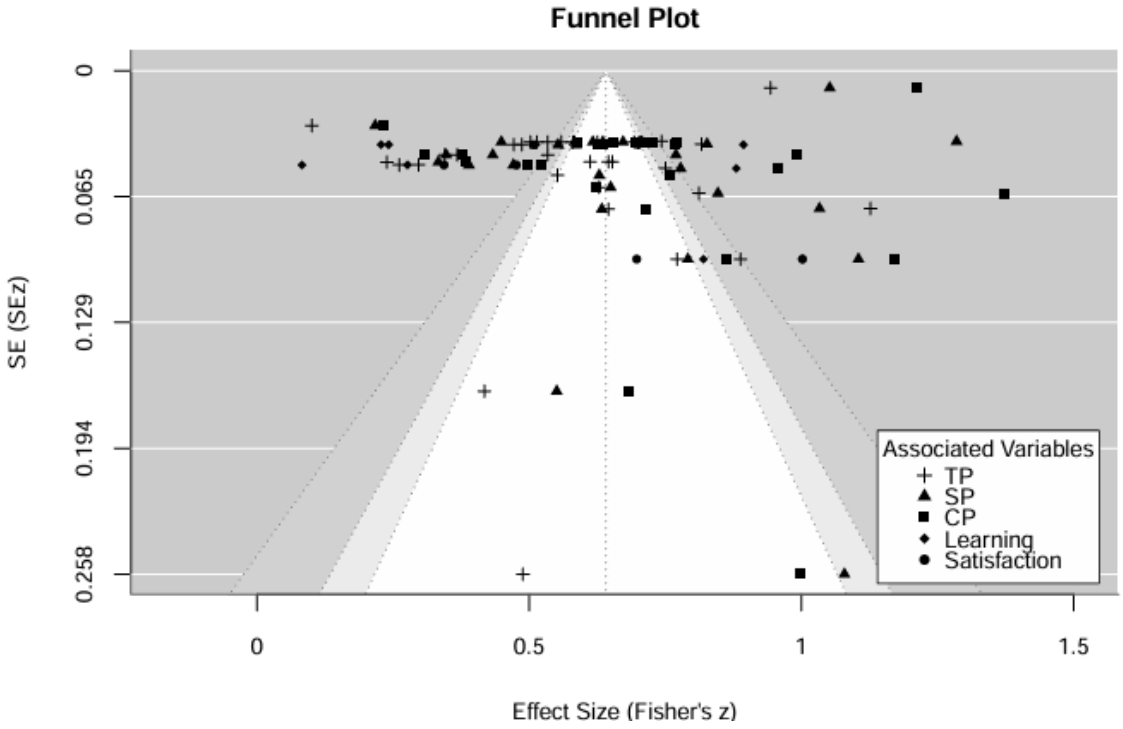
Egger's Regression Test Results

					95% CI	
	β	*SE*	*satt.df*	*p*	*LL*	*UL*
TP	0.02	1.20	2.55	.986	-4.20	4.25
SP	0.93	1.26	2.23	.532	-4.00	5.86
CP	1.91	1.74	2.58	.363	-4.16	7.89
Learning outcomes	8.59	2.09	1.08	.137	-13.56	30.74
Satisfaction	5.35	4.09	1.00	.416	-46.65	57.4

Note. TP = teaching presence, SP = social presence, CP = cognitive presence, *β* = regression coefficients of precision (SE) in Egger's regression test. *satt.df* = approximate degrees of freedom using Welch-Satterthwaite Formular.

Figure 3

Funnel Plots of Fisher's z-transformed Correlations (n = 103)



Note. TP = teaching presence, SP = social presence, CP = cognitive presence, Learning = learning outcomes.

Overall Effect Sizes Between Learning Presence and Other Presences

The average effect sizes indicated significant, large, and positive associations between LP and TP (r = .55, t(16.6) = 10.5, p <. 001, 95% CI[.46, .63]), SP (r = .62, t(15.7) = 10.8, p < .001, 95% CI[.53, .71]), and CP (r = .66, t(13.8) = 9.76, p < .001, 95% CI[.55, .74]). As indicated by significant Q statistics and large τ^2 in Table 5, substantial heterogeneity was observed across effect sizes in TP ($\tau^2_{between}$ = .056, τ^2_{within} = .003, I^2 = 97.7%), SP ($\tau^2_{between}$ = .068, τ^2_{within} = .007, I^2 = 98.2%), and CP ($\tau^2_{between}$ = .087, τ^2_{within} = .004, I^2 = 98.6%). The main sources of variability were primarily attributable to between-study differences rather than to within-study sampling error.

Table 5

Average Effect Sizes on the Relations between LP and Other Presences within CoI framework

				95% CI		Heterogeneity		
	k	*m*	*r*	*LL*	*UL*	*Q*(*df*)	$\tau^2_{between}$	τ^2_{within}
LP-TP	32	18	.55***	.46	.63	*Q*(31) = 1476.08***	.056	.003
LP-SP	29	17	.62***	.53	.71	*Q*(28) = 1476.08***	.068	.007
LP-CP	27	16	.66***	.55	.74	*Q*(26) = 2231.48***	.087	.004

Note. LP = Learning Presence, TP = Teaching Presence, CP = Cognitive presence, *k* = the numbers of effect sizes, *m* = the numbers of primary studies, *r* = average correlation coefficient, LL = lower limit of 95% CI, UL = upper limit of 95% CI, τ^2_{within} = heterogeneity of within-study, $\tau^2_{between}$ = heterogeneity from between-study.

*$p < .05$, **$p < .01$, ***$p < .001$.

Overall Effect Sizes Between LP and Learning Outcomes and Satisfaction

Similar to the relationships between LP and the three presences, the average effect sizes indicated significant, large, and positive associations between LP and learning outcomes ($r = .53$, $t(2.94) = 3.45$, $p = .042$, 95% CI [.04, .81]) and satisfaction ($r = .53$, $t(1.99) = 5.22$, $p = .035$, 95% CI [.10, .80]). Notably, we differentiated learning outcomes into actual learning (e.g., GPA) and perceived learning. The two categories yielded different effect sizes: actual learning ($r = .22$, based on 2 studies with 4 effect sizes, $p = .09$) and perceived learning ($r = .66$, based on 3 studies with 5 effect sizes, $p = .04$). As indicated by significant Q statistics and large τ^2 in Table 6, substantial heterogeneity was observed across effect sizes in learning outcomes ($\tau^2_{between} = .084$, $\tau^2_{within} = .056$, $I^2 = 98.57\%$). Table 6 indicated substantial heterogeneity was observed across effect sizes in learning outcomes ($\tau^2_{between} = .084$, $\tau^2_{within} = .056$, $I^2 = 98.5\%$) and satisfaction ($\tau^2_{between} = .028$, $\tau^2_{within} = .018$, $I^2 = 94.6\%$). Contrary to the relations between LP and other presences, the main sources of heterogeneity were both between- and within-study differences.

Table 6

Average Effect Sizes on the Relations between LP and Learning Outcomes

				95% CI		Heterogeneity		
	k	*m*	*r*	*LL*	*UL*	*Q*(*df*)	$\tau^2_{between}$	τ^2_{within}
LP-Learning outcomes	9	4	.53*	.04	.81	*Q*(8) = 735.99***	.084	.056
Perceived learning	5	3	.66*	.36	.84	*Q*(4) = 187.37***	.000	.035
Actual learning	4	2	.22	-.16	.55	*Q*(3) = 18.56***	.000	.004
LP-Satisfaction	6	3	.54*	.10	.80	*Q*(5) = 77.70***	.028	.018

Note. LP = Learning Presence, *k* = the numbers of effect sizes, *m* = the numbers of primary studies, *r* = average correlation coefficient, LL = lower limit of 95% CI, UL = upper limit of 95% CI, τ^2_{within} = within-study variation, $\tau^2_{between}$ = between-study variation.

$^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

Meta Regressions

Table 7 presents the results of separate meta-regression models examining the relations between LP and the other presences, simultaneously entering three moderators: educational level, cultural context, and instructional modality. Undergraduate students, North America, and online learning were specified as the reference groups for each moderator, respectively. To satisfy the linearity assumption of the regression model, all results were interpreted and reported in Fisher's z-transformed units.

Across the three meta-regression models examining the relations between LP and the other presences, most moderators did not demonstrate significant effects. Educational level and instructional modality were generally not associated with variability across effect sizes. One exception was identified for SP in which studies conducted with samples in graduate showed significantly stronger associations compared to undergraduate samples (β = 0.50, p = .029). For research locations, no significant differences were observed for studies conducted in Asia.

Table 7

Results of Meta-Regressions on the Relations Between LP and the Three Presences (Fisher's z-Transformed)

	TP				SP				CP			
	β	*SE*	95% CI		*β*	*SE*	95% CI		*β*	*SE*	95% CI	
			LL	*UL*			*LL*	*UL*			*LL*	*UL*
Intercept	0.60**	0.12	0.29	0.92	0.58*	0.16	0.16	1.00	0.78**	0.17	0.33	1.23
Educational Levels (ref: undergraduate)												
Graduate	-0.13	0.12	-0.45	0.18	0.50*	0.16	0.08	0.92	0.20	0.17	-0.25	0.65
K-12	-0.13	0.09	-0.46	0.19	-0.03	0.11	-0.44	0.37	-0.01	0.20	-0.73	0.70
Post-secondary	0.19	0.10	-0.10	0.47	0.24	0.10	-0.07	0.56	0.31	0.13	-0.09	0.71
Research Location (ref: North America)												
Asia	0.06	0.11	-0.21	0.32	0.21	0.16	-0.18	0.60	0.07	0.14	-0.28	0.41
Instructional Modality (ref: online)												
Blended	-0.17	0.10	-0.46	0.11	-0.21	0.11	-0.54	0.12	-0.23	0.13	-0.63	0.16
Mixed	-0.36	0.29	-1.64	0.91	-0.16	0.44	-1.90	1.57	-0.80	0.29	-1.70	0.10

Note. TP = teaching presence, SP = social presence, CP = cognitive presence, *β* = z-transformed regression coefficients.

$^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

Discussion

As LP has increasingly been regarded as a fourth presence within the CoI framework, research on this topic has steadily grown. However, prior studies differ in how LP is conceptualized and operationalized, and even the terminology used to describe the construct varies across the literature. Moreover, to our knowledge, no quantitative synthesis has examined how LP relates to the three established CoI presences as well as to student learning outcomes. The present review investigated how LP has been conceptualized in empirical research using qualitative synthesis (RQ1) and meta-analyzed its quantitative associations with TP, SP, CP, as well as satisfaction and learning outcomes (RQ2).

RQ1: Conceptualization of LP

Despite terminological variation (e.g., learning presence or learner presence), the conceptual analysis of 51 empirical studies indicates that a substantial proportion of LP research (n = 45, 88.2%) remains deeply rooted in the regulation of learning, particularly SRL. This indicates that LP is primarily operationalized as an individual learner's capacity to plan, monitor, and evaluate their own learning in online or blended contexts. Moreover, even studies (n = 6, 11.8%) that do not explicitly frame LP within a regulatory learning perspective tend to conceptualize it in closely related individual-level terms, such as self-directed learning (Bosch & Laubscher, 2022; Xu, 2019), the use of metacognitive strategies (Honig & Salmon, 2021), learning habits (Günbatar, 2021), or motivational constructs (e.g., self-efficacy). This pattern suggests that LP has been predominantly interpreted through an individualistic lens, even when regulatory terminology is not directly invoked.

This orientation is also reflected in how LP has been measured in empirical research. Quantitative studies commonly rely on self-report instruments capturing SRL strategies, such as the MSLQ (Pintrich et al., 1993), OSLQ (Bernard et al., 2009), WebTalk (Wertz, 2022) or the LP scale validated by Shea and Bidjerano (2010). Likewise, in qualitative research, learner artifacts (e.g., discussion postings, transactions, or interviews on learning experiences) are frequently analyzed according to coding schemes used in Shea et al., (2014) which is based on the four phases of Zimmerman's cyclical model of self-regulation (Zimmerman, 2008). Collectively, these approaches indicate that LP has been predominantly conceptualized and assessed as an individual-level regulatory construct, with relatively less attention to regulatory processes in collaborative settings.

However, recent theoretical developments have suggested that conceptualizing LP solely as an individual regulatory process may not fully reflect the collaborative dimensions of learning emphasized in online inquiry environments (Garrison, 2022; Shea et al., 2022). Building on recent theoretical developments, particularly those positioned by Shea et al. (2022), LP has recently been conceptualized by some scholars as a broader regulatory construct encompassing self-, co-, and socially shared regulation of learning (DiDonato, 2013; Hadwin & Oshige, 2011). From this perspective, LP reflects not merely the use of metacognitive or self-regulated strategies in individual learning phases, but the collaborative learning processes through which learners negotiate shared goals (Järvelä & Hadwin, 2013), monitor collaborative learning progress (Näykki et al., 2017), regulate motivation and emotion within group contexts (Järvenoja et al., 2020).

Furthermore, conceptualizing LP solely as an individual-level regulatory learning process may weaken its conceptual distinctiveness. Although CP is partially a collaborative construct within the CoI framework, its operationalization often reflects learners' individual inquiry and meaning-making processes, thereby increasing potential conceptual overlap between LP and CP. In fact, SRL processes such as planning, reflection, and monitoring are conceptually similar to the phases emphasized in CP, which may yield insufficient conceptual distinctions between the two constructs. Such overlap is reflected in ongoing debates regarding the distinctive role of LP within CoI (Garrison & Akyol, 2013). Therefore, reconceptualizing LP as a comprehensive learning regulation construct-overarching self-, co-, and socially shared regulation does more than just evolve the concept of LP; it provides the clarity needed to strengthen the CoI framework.

Based on the findings of this review, we propose that LP can be conceptualized as the regulatory processes through which learners individually and collectively plan, monitor, evaluate, and adapt their learning in online inquiry environments. This definition encompasses self-regulation, co-regulation, and socially shared regulation of learning (Shea et al., 2022) while distinguishing LP from cognitive presence by emphasizing the regulation of learning processes rather than the construction of knowledge itself.

RQ 2: Meta-Analysis of LP

Regarding RQ2, the results of the present meta-analysis partially offer empirical support for these conceptual concerns of LP. Consistent with prior research (e.g., Shea & Bidjerano, 2010, 2012), LP demonstrated strong positive associations with the three core presences of the CoI framework (TP, SP, and CP). The magnitude of these correlations was substantial and positive, with CP (r = .66), SP (r = .62), and TP (r = .55). Interpreted in terms of shared variance, approximately 43.6% of the variance in LP overlaps with CP, and about 38% overlaps with SP. Such substantial overlap in variance implies that LP is not only closely intertwined with the other presences within the CoI framework, but also raises conceptual questions about the unique role of LP.

Given that a large number of the studies in this review defined LP primarily from an individual regulatory perspective, these findings reinforce the notion that regulatory processes are deeply embedded within the broader role of CP in online learning environments. At the same time, they raise important questions about the distinctiveness of LP as a separate presence. Future research should examine how LP relates to the other presences in CoI framework when it is defined more comprehensively to include self-, co-, and socially shared regulation. Such investigations could help enhance the theoretical and observed distinctiveness of LP.

Next, LP demonstrated substantial positive, strong correlations with both learning outcomes (r = .53) and satisfaction (r = .54). The magnitude of these associations is comparable to prior meta-analytic findings examining the relationships between the established CoI presences and learning outcomes (Caskurlu et al., 2020; Richardson et al., 2017; Martin et al., 2022). These results suggest that, similar to TP, SP and CP, LP is meaningfully related to students’ satisfaction and learning in online and blended learning environments.

An especially noteworthy finding emerged when distinguishing between actual and perceived learning outcomes. The association between LP and perceived learning (r = .66) was stronger than that with objectively measured learning (r = .22). This pattern aligns with Martin et al.'s (2022) meta-analysis, which reported that three presences were more strongly related to perceived learning than to objective performance measures. One possible reason is that LP is typically measured using self-reported questionnaires, which are methodologically aligned with perceived learning rather than objective performance. Such self-report measures tend to inflate effect sizes, thereby increasing their association with subjective outcomes (Cote & Buckley, 1987; Podsakoff et al., 2003).

To explore the substantial heterogeneity in the associations between LP and the three CoI presences, we conducted meta-regression analyses. Contrary to Chang et al.'s (2025) expectation that educational level, cultural variation, and instructional modality would meaningfully moderate effect sizes, the results revealed relatively limited moderator effects. Additionally, educational level significantly moderates the relations between LP and SP, with stronger associations observed at the graduate level. One possible explanation is that, compared to undergraduate education, graduate contexts require greater learner agency and more advanced self-regulatory capacity (Artino & Stephens, 2009; Xu et al., 2023). Accordingly, regulatory processes may be more activated through socially mediated learning activities, such as peer-review and scholarly critique. This distinctive nature of graduate education may lead LP and SP to be more tightly intertwined.

Despite the substantial heterogeneity observed across study-level effect sizes, only a limited number of moderators reached statistical significance. This pattern suggests the potential presence of unexamined moderators. Future research should further investigate additional contextual, methodological, and theoretical factors that may account for this heterogeneity.

Lastly, our findings also have implications for online teaching and learning. Across studies, LP demonstrated consistently strong associations with TP, SP, CP, learning outcomes, and satisfaction. While these findings do not argue for causal relations, they suggest that learners' regulatory processes are closely linked to meaningful online learning experiences. Accordingly, online course designers and instructors may benefit from incorporating learning activities that make regulatory processes more visible and support learners' planning, monitoring, and reflection throughout the learning process. At the practical level, this can be exemplified as structured reflection prompts, self-monitoring activities, progress tracking tools through learning analytical tools, and opportunities for peer feedback. These approaches may help create learning environments that better support their regulatory processes and active engagement within online communities of inquiry. At the policy level, universities and online education institutions should consider developing systematic support structures, including orientation programs, learning analytics dashboards, and learner support services, to strengthen students' self-, co-, and socially shared regulation capacities.

Limitations and Future Directions

Despite the contributions of our findings, there are still limitations that should be acknowledged when interpreting the findings of this review. First, although we attempted to identify as many studies on LP as possible through multiple database searches and hand search

processes (see Figure 1), it is unlikely that we identified and included all related literature in this review. In particular, varying terminology (e.g., language learner presence, self-regulated learning presence) and inconsistencies in indexing practices may have resulted in the potential omission of relevant work. Every effort was made to capture the population of LP studies including a robust search, screening, and referral from existing reviews.

Although approximately 27 studies were identified as quantitative designs, only 18 were ultimately included in the meta-analysis due to insufficient statistical information or methodological constraints. This reduced sample size potentially limits the generalizability of the meta-analytic findings. The exclusion of quantitatively designed studies highlights issues in current reporting practices in ODDE literature. Future studies should provide more complete statistical information (e.g., comprehensive descriptive statistics and effect size data, especially sample sizes) and ensure greater methodological transparency to support cumulative knowledge building on LP.

Regarding our findings of RQ2, the strong associations between LP and the three CoI presences suggest that online instructors should intentionally design learning environments that support learners' learning regulations. Rather than assuming that students will naturally self-regulate in online settings, instructional activities should incorporate opportunities for goal setting, progress monitoring, reflection, and feedback. Given recent conceptualizations of LP that extend beyond individual level of learning regulation, collaborative activities such as peer feedback, group planning, and shared goal settings and reflection may also help foster co-regulation and socially shared regulation of learning. Designing online courses that explicitly support these regulatory processes may strengthen learners' engagement and contribute to more meaningful inquiry within the CoI framework.

A quality evaluation across included studies was conducted. Nearly half of the reviewed studies employed qualitative (n = 13) or mixed methods designs (n = 11). Given the heterogeneity in research paradigms across the LP-related scholarship, applying a unified quality appraisal framework was methodologically challenging. Consequently, the quality evaluation (e.g., STROBE Checklist, Von Elm et al., 2007) was limited and may not fully capture methodological rigor across diverse study types. In order to capture literature as diverse as CoI, quality frameworks robust to the full range of methodologies are needed.

Finally, the conceptualization of LP remains heterogeneous and, at the same time, insufficiently specified. Future research should examine whether the strength and pattern of LP's associations with other CoI presences vary across different conceptualizations of LP (e.g., self-regulation, co-regulation, socially shared regulation, self-efficacy, or self-directed learning). Such work would help determine whether these conceptual distinctions reflect substantively different constructs or alternative operationalizations of a common underlying phenomenon. Relatedly, to enable more precise theoretical advancement, future research would benefit from critical analyses grounded in clearly defined and rigorously applied conceptual criteria. For example, Chang et al. (2025) restricted their review to quantitative studies to enhance conceptual consistency, whereas the present study adopted a more inclusive approach to capture the broader range of LP conceptualizations. This represents a trade-off: while such inclusiveness allowed for greater coverage in literature identification, it also led to lower conceptual coherence. Other approaches include establishing more stringent inclusion criteria (e.g., studies in synchronous

online learning settings) and conducting theory-informed critical analyses (e.g., synchronous instructor presence in Krebs-Lazendic et al., 2026) to clarify construct boundaries and strengthen conceptual definitions. Both approaches are needed in order to move the ODDE literature as it intersections with CoI forward.

Conclusions

Since Shea and Bidjerano (2010) proposed *learning presence* to address the under-specification of learners' regulatory agency in the original CoI framework, research on LP has gained increasing scholarly attention and invoked debates about its distinctive role within the CoI framework (Garrison & Akyol, 2013). This review synthesized 51 empirical studies and conducted meta-analyses of 18 quantitative studies (k = 103 effect sizes) to clarify how LP has been conceptualized, measured, and empirically related to key CoI constructs. LP research is largely grounded in regulation of learning, particularly at the individual levels; however, its operationalization has not yet achieved conceptual consensus in literature. Meta-analytic findings indicate strong, positive associations between LP and TP, SP, and CP, as well as satisfaction and learning outcomes, with stronger links to perceived than to objective learning. However, the substantial overlap between LP and existing presences, particularly CP (r = .66, p < .001), raises questions about whether LP constitutes a distinct presence or functions as a metacognitive mechanism within CP. These findings highlight the need for clearer construct delineation and conceptual refinement (Shea et al., 2022). Furthermore, to build a more robust knowledge base on LP and CoI research, greater methodological rigor and more consistent reporting practices are needed. Improving reporting quality as well as the volume of literature will allow scholars to find ways to assure LP is making an important and unique contribution to CoI outcomes, either through critical/conceptual review or meta-analytics structural equation modeling.

Ethics board approval or exemption statement

This study is a systematic and meta-analytic review based on previously published studies and did not involve human subjects. Therefore, Institutional Review Board approval was not required.

Conflicts of interest statement

The authors declare no conflicts of interest.

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