

From Teaching to Learning Agency: Developing and Validating a Framework for Student-Centered Pedagogy in Contemporary Education

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Abstract: The transition from teacher-centered instruction toward student-centered pedagogy represents a major development in contemporary educational theory and practice. Yet the conceptual mechanisms through which student-centered pedagogical practices foster students' capacity to act purposefully within learning environments remain insufficiently specified. In particular, student agency is frequently discussed alongside autonomy, engagement, participation, self-regulated learning, student voice, and empowerment without adequate conceptual differentiation, contributing to theoretical fragmentation and inconsistent measurement. This study proposes the Student Learning Agency Framework (SLAF), a multidimensional model explaining how specific student-centered pedagogical practices may cultivate students' agentic capacities. The framework conceptualizes learning agency through interrelated dimensions of intentional action, strategic self-regulation, participatory influence, reflective adaptation, and perceived capacity to influence learning processes. Six pedagogical conditions learner choice, dialogic teaching, formative feedback, collaborative learning, reflective practice, and participation in educational decision-making are proposed as antecedents of learning agency. A multi-stage instrument-development and validation study is designed to test the framework. The proposed methodology incorporates construct specification, expert content validation, cognitive pretesting, pilot testing, exploratory factor analysis, confirmatory factor analysis, reliability assessment, convergent and discriminant validity testing, structural equation modelling, and measurement-invariance analysis. Rather than treating student-centered education as a collection of instructional techniques, the proposed framework theorizes it as an educational environment capable of redistributing opportunities for intentional, reflective, and consequential student action. The study is presented as an empirical research protocol; consequently, no findings are fabricated or anticipated as observed results. The framework is intended to contribute to educational theory by clarifying the conceptual boundaries of learning agency and providing an empirically testable explanation of how pedagogical practices may support its development.

Keywords: student agency; student-centered pedagogy; learner agency; self-regulated learning; student voice; formative feedback; educational theory; structural equation modelling; scale development.

1. Introduction

Nearly three decades after Barr and Tagg (1995) called for a shift “from teaching to learning,” student-centered pedagogy has become a prominent orientation in educational research and reform. Its empirical rationale is substantial. Active learning has been associated with improved academic performance compared with conventional lecture-based instruction (Freeman et al., 2014), with evidence suggesting particularly important benefits for students from historically underrepresented groups (Theobald et al., 2020). Research further indicates that learning outcomes depend not simply on students being active, but on the depth of cognitive engagement generated by instructional activities (Chi & Wylie, 2014). Related evidence supports the educational value of student-focused teaching, formative feedback, cooperative learning, and dialogic interaction (Hattie & Timperley, 2007; Johnson & Johnson, 2009; Kyndt et al., 2013; Trigwell et al., 1999).

Despite this broad endorsement, student-centered pedagogy remains conceptually heterogeneous. The term encompasses practices ranging from learner choice and collaborative learning to inquiry, dialogue, formative assessment, and participation in decision-making. Consequently, student-centeredness can function as an aspirational label rather than a theoretically precise pedagogical construct. Its implementation also varies across cultural and institutional contexts (Schweisfurth, 2013; Tabulawa, 2003). Moreover, evidence concerning instructional guidance cautions against equating student-centered learning with minimal teacher direction; guided and scaffolded approaches generally outperform minimally guided alternatives (Alfieri et al., 2011; Kirschner et al., 2006; Lazonder & Harmsen, 2016).

The critical distinction, therefore, is not simply between teacher-centered and student-centered instruction. Teacher guidance and student agency need not be opposites. Teachers can provide substantial structure while creating meaningful opportunities for students to make decisions, articulate ideas, evaluate feedback, regulate learning, and influence educational processes. The more consequential question is which pedagogical conditions enable students to become purposeful and influential participants in their own learning.

We address this question through the concept of student learning agency. Agency broadly concerns individuals’ capacity to act intentionally and influence their actions and circumstances (Bandura, 2001). Sociological and ecological perspectives further emphasize that agency is situated within social, cultural, and structural conditions rather than existing solely as an individual disposition (Ahearn, 2001; Emirbayer & Mische, 1998). Within education, agency has similarly been conceptualized as dynamic, relational, and context-dependent (Mercer, 2011; Rajala et al., 2016).

However, educational uses of agency remain conceptually fragmented. Agency is frequently associated with autonomy, self-regulated learning, engagement, participation, student voice, and empowerment, although these constructs are related rather than interchangeable. Autonomy concerns volition and self-endorsed action (Ryan & Deci, 2000); self-regulated learning concerns learners’ strategic regulation of

cognition, motivation, and behavior (Zimmerman, 1990); engagement concerns students' involvement in learning (Fredricks et al., 2004); and student voice emphasizes opportunities to express perspectives and potentially influence educational processes. A student can therefore be highly engaged or self-regulated while having little influence over learning goals or conditions. Similarly, providing students with choices or opportunities to speak does not necessarily establish agency when those opportunities have little consequence for learning.

This conceptual overlap creates difficulties for both theory and measurement. Existing scholarship has operationalized student agency and related forms of agentic engagement, demonstrating that agency can be examined multidimensionally. The unresolved issue, therefore, is not simply whether student agency can be measured. Rather, there remains a need for an integrated explanatory framework specifying how identifiable student-centered pedagogical practices relate to theoretically differentiated dimensions of learning agency.

The present study addresses this gap by proposing the Student Learning Agency Framework (SLAF). We define student learning agency as *the contextually situated capacity of learners to intentionally influence, regulate, participate in, and reflectively adapt their learning actions and learning conditions in pursuit of educational purposes*. This definition distinguishes agency from simple activity or independence by emphasizing intentionality, regulation, participation, reflection, and consequential influence within pedagogical contexts.

SLAF proposes six student-centered pedagogical conditions learner choice, dialogic teaching, formative feedback, collaborative learning, reflective practice, and participatory decision-making as potential antecedents of five dimensions of learning agency: intentional action, strategic self-regulation, participatory influence, reflective adaptation, and perceived agentic capability. Rather than asking whether a classroom is broadly "student-centered," the framework asks a more theoretically precise question: which pedagogical practices support which dimensions of student learning agency?

Accordingly, the study has four objectives: (1) to clarify the conceptual boundaries between student learning agency and related constructs; (2) to develop an integrated theoretical framework connecting student-centered pedagogical practices with distinct dimensions of agency; (3) to translate the framework into a psychometrically testable measurement model; and (4) to specify an empirical validation strategy involving instrument development, expert validation, exploratory and confirmatory factor analysis, reliability and construct-validity assessment, structural equation modelling, and measurement-invariance testing.

The proposed contribution is therefore not another general argument in favor of student-centered education. Rather, SLAF seeks to advance the field toward a mechanism-oriented account of how pedagogical environments may cultivate student agency. Because empirical validation has not yet been conducted, the present study is framed as a theoretically grounded research protocol. The framework and its

hypothesized relationships are therefore presented for empirical testing rather than as established findings.

2. Research Problem

Three interrelated problems motivate this study.

2.1 Conceptual Fragmentation

Student agency overlaps with several established constructs, including autonomy, self-regulated learning, engagement, participation, student voice, and empowerment (Klemenčič, 2017; Mercer, 2011; Vaughn, 2020). However, these concepts arise from different theoretical traditions and should not be treated as interchangeable. Autonomy is closely associated with self-determination theory (Deci & Ryan, 1985; Ryan & Deci, 2000), self-regulated learning with social-cognitive and metacognitive perspectives (Panadero, 2017; Zimmerman, 1990), and engagement with research on students' behavioral, emotional, and cognitive involvement in learning (Fredricks et al., 2004). Student voice and participation, in turn, emphasize students' opportunities to contribute to and influence educational processes (Cook-Sather, 2006; Fielding, 2004; Mitra, 2014).

This conceptual overlap has produced competing interpretations of agency as a capacity students possess, an action they perform, an individual characteristic, or a relational accomplishment emerging through interaction with educational contexts (Emirbayer & Mische, 1998; Rajala et al., 2016). Without clearer construct boundaries, findings attributed to "agency" may represent different underlying phenomena, limiting theoretical accumulation and empirical comparison.

2.2 Measurement and Construct-Validation Problem

Educational research provides well-established measures of related constructs, including engagement, agentic engagement, self-efficacy, self-regulated learning, and perceived autonomy support (Pajares, 1996; Pintrich et al., 1993; Reeve & Tseng, 2011; Williams & Deci, 1996). More recent scholarship has also begun to operationalize student agency as a multidimensional construct. The central measurement problem, therefore, is not the complete absence of agency measures, but the lack of sufficient empirical testing of an integrated model linking theoretically differentiated dimensions of learning agency to specific student-centered pedagogical conditions.

The proposed Student Learning Agency Framework (SLAF) addresses this problem by distinguishing dimensions of agency and testing whether they can be measured reliably, differentiated from neighboring constructs, and systematically related to pedagogical practices. This approach follows established scale-development principles requiring clear construct specification before empirical validation (Boateng et al., 2018; Worthington & Whittaker, 2006).

2.3 Weak Pedagogy–Agency Linkage

Student-centered pedagogy encompasses practices such as learner choice, dialogue, formative feedback, collaboration, reflection, and participation in decision-making (Schweisfurth, 2013; Weimer, 2013). However, the theoretical pathways connecting

these practices to particular dimensions of student agency remain insufficiently specified. Student-centered practices are often assumed to promote agency without identifying which practices support which agentic capacities and through what mechanisms.

This limitation creates a theory–practice gap. Without an explicit explanatory model, researchers have difficulty testing how pedagogical environments support agency, while educators lack a sufficiently principled basis for distinguishing activities that merely increase student participation from those that provide meaningful opportunities for intentional, strategic, reflective, and consequential action. Accordingly, the present study addresses the following overarching research question:

How can student learning agency be conceptualized and empirically validated as a multidimensional construct, and how are specific student-centered pedagogical practices associated with its dimensions?

3. Literature Review

3.1 From Teacher-Centered Instruction to Student-Centered Pedagogy

The critique of transmission-oriented instruction has deep roots in progressive and sociocultural educational theory. Dewey (1916) emphasized learning through experience and growth, Freire (1970) challenged transmissive “banking” models in favor of dialogic and problem-posing education, and Vygotsky (1978) demonstrated the central role of socially mediated activity in cognitive development. In higher education, Barr and Tagg (1995) reframed this tradition as a shift from delivering instruction to producing learning.

Subsequent empirical research has provided substantial support for pedagogies that actively engage students. Student-focused approaches to teaching are associated with deeper approaches to learning (Trigwell et al., 1999), active learning generally improves achievement relative to traditional lecturing (Freeman et al., 2014), and structured cooperative learning produces positive academic outcomes (Johnson & Johnson, 2009; Kyndt et al., 2013). The ICAP framework further suggests that learning outcomes depend on the quality of cognitive engagement, with constructive and interactive activity generally offering greater learning potential than passive reception (Chi, 2009; Chi & Wylie, 2014).

However, student-centered pedagogy should not be equated with reduced instructional guidance. Research on discovery and inquiry learning indicates that guided and scaffolded designs typically outperform minimally guided alternatives, particularly for novice learners (Alfieri et al., 2011; Kirschner et al., 2006; Lazonder & Harmsen, 2016). Moreover, learner-centered reforms are interpreted differently across cultural and institutional contexts and may result in hybrid forms of implementation (Schweisfurth, 2013; Tabulawa, 2003).

Accordingly, student-centered pedagogy is better understood as structured, guided, and contextually situated practice that expands learners’ opportunities for meaningful

participation, decision-making, regulation, dialogue, and reflection, rather than simply as the absence of teacher direction.

3.2 Core Student-Centered Pedagogical Practices

Across the literature, six pedagogical domains are particularly relevant to the development of student learning agency.

Learner choice and autonomy support.

Self-determination theory suggests that meaningful choice, acknowledgment of student perspectives, and appropriate rationale can support autonomous motivation (Ryan & Deci, 2000). Autonomy-supportive teacher behaviors are positively associated with student engagement, while the effects of choice depend on its relevance and meaningfulness (Patall et al., 2008; Reeve & Jang, 2006).

Dialogic teaching.

Dialogic pedagogy emphasizes open questioning, extended student contributions, responsiveness, and collaborative meaning-making. Such interactions create opportunities for students to articulate, challenge, and develop ideas rather than merely respond to teacher prompts (Alexander, 2008; Howe & Abedin, 2013; Mercer & Littleton, 2007).

Formative feedback.

Feedback contributes most strongly to learning when students can interpret performance information and use it to regulate subsequent action (Hattie & Timperley, 2007; Sadler, 1989). Formative assessment therefore becomes increasingly agentic when learners participate actively in evaluating progress, generating feedback, and deciding how to respond (Black & Wiliam, 1998; Nicol & Macfarlane-Dick, 2006).

Collaborative learning.

Well-structured collaboration can enhance achievement and provide opportunities for learners to negotiate perspectives, coordinate actions, and assume shared responsibility (Johnson & Johnson, 2009; Kyndt et al., 2013). Its value, however, depends on the quality of interaction rather than mere group participation.

Reflective practice.

Reflective traditions emphasize deliberate examination of experience, strategy, and outcomes as a basis for improving future action (Boud et al., 1985; Kolb, 1984; Schön, 1983). Reflection is therefore theoretically important for the adaptive dimension of agency.

Participation and decision-making.

Student voice research highlights the importance of giving learners meaningful opportunities to influence educational processes rather than merely expressing opinions (Cook-Sather, 2006; Fielding, 2004; Mitra, 2014). Such opportunities are particularly relevant to the participatory and relational dimensions of agency.

3.3 Student Agency and Adjacent Constructs

Agency is generally concerned with intentional action and the capacity to influence one's functioning and circumstances. Social cognitive theory emphasizes intentionality, forethought, self-reactiveness, and self-reflection as central features of human agency (Bandura, 2001). Sociological perspectives add the importance of temporality, structure, and context, conceptualizing agency as action enacted within and upon social environments (Emirbayer & Mische, 1998).

In education, learner agency is increasingly viewed as dynamic, relational, and context-dependent rather than as a fixed personal trait (Mercer, 2011; Rajala et al., 2016). This makes it necessary to distinguish agency from related constructs.

Autonomy refers primarily to volition and self-endorsed action (Ryan & Deci, 2000). It can support agency but is not equivalent to it. Self-regulated learning concerns learners' planning, monitoring, and adjustment of cognition, motivation, and behavior (Panadero, 2017; Zimmerman, 1990). These processes represent an important strategic dimension of agency but do not fully capture students' influence over learning conditions. Engagement concerns behavioral, emotional, cognitive, and, in some models, agentic involvement in learning (Fredricks et al., 2004; Reeve & Tseng, 2011). Engagement reflects participation in activity, whereas agency concerns a broader capacity to intentionally shape learning. Participation and student voice concern involvement and opportunities to express perspectives or influence decisions (Cook-Sather, 2006; Mitra, 2014). They represent important manifestations of agency but do not exhaust the construct. Empowerment concerns increased capacity or opportunity to exercise influence, often in relation to power structures. It may therefore be understood as an enabling condition or outcome of agency rather than its synonym.

3.4 Conceptual Distinctions

The conceptual distinction underlying SLAF is summarized in Table 1.

Table 1. Conceptual map of agency-adjacent constructs

Construct	Core referent	Relationship to learning agency
Autonomy	Volition and self-endorsed action	Enabling experiential condition
Self-regulated learning	Strategic regulation of learning	Strategic component of agency
Engagement	Involvement in learning activity	Correlate and possible manifestation
Participation	Behavioral involvement	Observable but not necessarily agentic
Student voice	Expression and influence in decisions	Participatory manifestation of agency
Empowerment	Capacity/opportunity to exercise influence	Enabling condition or possible outcome
Student learning agency	Contextually situated capacity for intentional, regulatory, participatory, and reflective action	Integrative target construct of SLAF

This conceptual map avoids treating neighboring constructs as interchangeable while recognizing their theoretical overlap.

3.5 Measurement and Integration Limitations

Existing educational measures assess important components related to agency, including engagement, agentic engagement, self-efficacy, self-regulated learning, and perceived autonomy support (Pajares, 1996; Pintrich et al., 1993; Reeve & Tseng, 2011; Williams & Deci, 1996). More recent research has also begun to operationalize student agency itself as a multidimensional construct.

The remaining limitation is therefore not the absence of agency measurement, but the limited integration between multidimensional agency measurement and theoretically specified student-centered pedagogical antecedents. Existing instruments often emphasize either learner dispositions and behaviors or characteristics of the instructional environment, while fewer models test how specific pedagogical practices correspond to distinct dimensions of student learning agency.

The proposed Student Learning Agency Framework addresses this limitation by linking six pedagogical domains learner choice, dialogic teaching, formative feedback, collaborative learning, reflective practice, and participatory decision-making to theoretically differentiated dimensions of agency. The framework is therefore intended not simply to introduce another scale, but to provide a testable explanatory model of how student-centered pedagogy may support agentic learning.

4. Theoretical Foundations

The Student Learning Agency Framework (SLAF) integrates four complementary theoretical traditions. First, social cognitive theory provides the core architecture of agency. Bandura (1989, 2001) identifies intentionality, forethought, self-reactiveness, and self-reflectiveness as central features of human agency. These features inform the proposed dimensions of intentionality and goal-directedness, strategic self-regulation, and reflective ownership. Social cognitive theory also emphasizes perceived capability and self-efficacy as important foundations for agentic action (Bandura, 2006; Pajares, 1996; Usher & Pajares, 2008).

Second, self-determination theory explains how educational environments may support volitional action. Satisfaction of the needs for autonomy, competence, and relatedness is associated with more autonomous forms of motivation and greater internalization of learning goals (Deci & Ryan, 1985; Ryan & Deci, 2000). Within SLAF, autonomy-supportive practices are therefore treated as enabling conditions that may strengthen students' willingness to make and enact meaningful learning choices.

Third, self-regulated learning theory specifies the strategic processes through which agency is enacted. Cyclical models of planning, performance monitoring, and self-reflection (Zimmerman, 1989, 1990), together with feedback-based models of metacognitive regulation (Butler & Winne, 1995; Panadero, 2017), provide the foundation for the strategic self-regulation dimension. This tradition also explains why formative feedback may support students' capacity to monitor progress, evaluate strategies, and adapt subsequent action (Black & Wiliam, 1998; Nicol & Macfarlane-Dick, 2006).

Fourth, sociocultural and dialogic perspectives emphasize that agency is relational and contextually enacted. Learning develops through mediated participation in social activity (Vygotsky, 1978), while classroom discourse structures opportunities to question, contribute, negotiate meaning, and influence collective activity (Alexander, 2008; Mercer & Littleton, 2007). These perspectives inform the dialogic participation and collaborative influence dimensions of SLAF and highlight the importance of student voice and participation in educational decision-making (Cook-Sather, 2006; Fielding, 2004; Rajala et al., 2016).

Synthesizing these traditions, SLAF adopts three meta-theoretical commitments. First, agency is multidimensional: beliefs, intentions, strategic regulation, participation, social influence, and reflection represent related but distinguishable aspects of agentic learning. Second, agency is developmental: it may be strengthened through repeated opportunities to exercise intentional and reflective action (Larsen-Freeman, 2019; Mercer, 2011). Third, agency is ecological: it emerges through interactions between learner capacities and the affordances and constraints of educational environments (Emirbayer & Mische, 1998; Klemenčič, 2017).

From this perspective, student-centered pedagogy can be conceptualized as an agency-supportive pedagogical ecology: a configuration of practices that provides structured opportunities for students to exercise different forms of agentic action.

5. Research Gap

The preceding literature identifies three principal gaps. First, conceptual fragmentation remains across psychological, sociological, sociocultural, and educational accounts of agency. Although these traditions offer complementary insights, they do not consistently distinguish student learning agency from related constructs such as autonomy, engagement, and self-regulated learning.

Second, measurement and theoretical integration remain limited. Existing research includes measures of student agency and related constructs, but fewer models integrate multidimensional agency with clearly specified pedagogical antecedents. Consequently, it remains unclear whether distinct forms of student-centered practice are associated with different dimensions of agency.

Third, pedagogy–agency mechanisms remain under-specified. Student-centered practices such as learner choice, dialogue, feedback, collaboration, reflection, and participation are frequently assumed to promote agency, but the pathways connecting particular practices to particular agentic capacities are seldom formalized and tested within a unified model.

SLAF addresses these gaps by providing an integrative conceptual architecture that distinguishes dimensions of student learning agency and specifies testable relationships between those dimensions and student-centered pedagogical practices.

6. Conceptual Framework: The Student Learning Agency Framework (SLAF)

6.1 Definition of Student Learning Agency

Drawing on the theoretical foundations above, student learning agency is defined as:

the contextually situated, multidimensional capacity of learners to intentionally direct, regulate, express, influence, and reflect upon their learning within educational environments.

Three properties are central to this definition.

First, agency involves both capacity and enactment: what learners perceive themselves as capable of doing and how those capacities are expressed in learning activity.

Second, agency is multidimensional. No single dimension such as self-efficacy, autonomy, engagement, or self-regulation fully represents the construct.

Third, agency is contextually enabled and constrained. Pedagogical environments may provide more or fewer meaningful opportunities for students to exercise agency.

6.2 Six Dimensions of Learning Agency

Table 2 defines the six proposed dimensions and gives representative item stems for the planned Student Learning Agency Scale (SLAS). Dimension labels and definitions were derived from the four theoretical traditions reviewed above, and item stems are written in first-person, present-tense, behavioral or belief-oriented language appropriate for a 5-point Likert response format.

Table 2. Dimensions of the Student Learning Agency Framework.

Dimension	Definition	Illustrative item stems (planned)
Agentic Beliefs (AB)	Perceived capability and control over one's learning; confidence to influence learning outcomes	"I am confident I can improve my learning even in difficult subjects"; "My efforts make a real difference to what I learn"
Intentionality & Goal-Directedness (IG)	Setting personally meaningful goals, making and enacting learning choices, initiating learning activity	"I set my own learning goals"; "When I choose how to learn something, I follow through"
Strategic Self-Regulation (SR)	Planning, monitoring, and adjusting strategies, cognition, and effort; metacognitive control	"Before starting a task, I plan how to approach it"; "When a strategy is not working, I change it"
Dialogic Participation (DP)	Voicing ideas and questions, engaging in academic talk, negotiating understanding with others	"I ask questions when I do not understand"; "I share and defend my ideas in class discussions"
Collaborative Influence (CI)	Contributing to and shaping group learning processes; co-constructing	"My contributions influence how my group works"; "I

Reflective Ownership (RO)	knowledge; reciprocal responsibility Self-evaluating against criteria, using feedback to improve, transferring learning, sense of authorship	help others learn and learn from them in return" "I judge my own work against clear standards"; "I use feedback to improve my next attempt"
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These dimensions are proposed as related but empirically distinguishable. Their final structure should therefore be treated as a hypothesis to be tested through exploratory and confirmatory factor analysis rather than assumed in advance.

6.3 Practice–Agency Pathways

The central proposition of SLAF is that different student-centered pedagogical practices may be associated with different dimensions of agency. Learner choice and autonomy support are expected to be particularly associated with agentic beliefs and intentionality by providing meaningful opportunities for students to exercise volition and make learning decisions (Patall et al., 2008; Ryan & Deci, 2000).

Dialogic teaching is expected to support dialogic participation by creating classroom conditions in which student questions, reasoning, and contributions have substantive relevance to learning activity (Alexander, 2008; Howe & Abedin, 2013).

Formative feedback is expected to be associated with strategic self-regulation and reflective ownership because effective feedback provides information students can use to monitor performance, revise strategies, and evaluate subsequent action (Butler & Winne, 1995; Nicol & Macfarlane-Dick, 2006; Sadler, 1989).

Collaborative learning is expected to support collaborative influence by requiring students to coordinate activity, negotiate perspectives, and contribute to collective learning processes (Johnson & Johnson, 2009; Kyndt et al., 2013).

Reflective practice is expected to be associated primarily with reflective ownership by encouraging learners to evaluate experience, identify patterns, and adjust future action (Boud et al., 1985; Schön, 1983).

Finally, participatory decision-making is expected to support intentionality, dialogic participation, and collaborative influence by creating legitimate opportunities for students to contribute to decisions concerning learning processes and environments (Cook-Sather, 2006; Fielding, 2004; Mitra, 2014).

Importantly, these pathways should be interpreted as hypothesized associations rather than established causal effects. Initial cross-sectional testing can evaluate whether the proposed relationships are supported, while longitudinal or experimental research would be required to determine whether particular pedagogical practices contribute to the development of agency over time. Figure 1 presents the full conceptual model, including the hypothesized distal relationships between agency dimensions and learning outcomes.

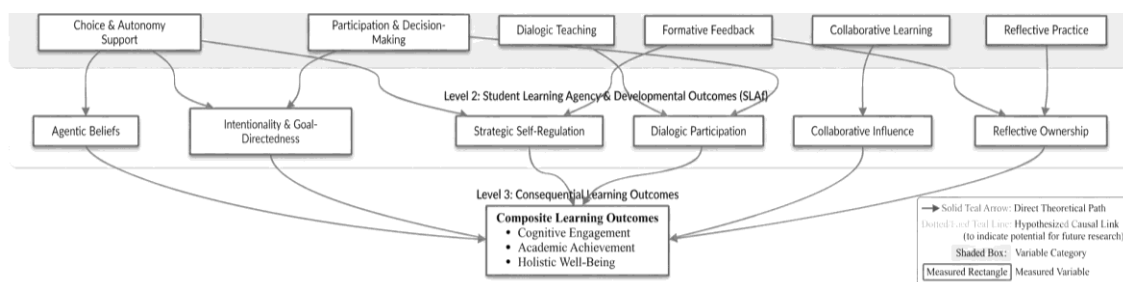


Figure 1. The Student Learning Agency Framework (SLAF): hypothesized practice–agency–outcome pathways

7. Hypotheses and Research Questions

The 7. Hypotheses and Research Questions

The proposed framework yields two research questions and eight primary hypotheses.

RQ1. Does student learning agency demonstrate the proposed six-dimensional structure, and can these dimensions be represented by a higher-order agency construct?

RQ2. Is the measurement structure of the Student Learning Agency Scale (SLAS) comparable across theoretically relevant student groups?

H1. The proposed six-factor model of student learning agency will demonstrate acceptable model fit and will outperform plausible alternative measurement models.

H2. The SLAS will demonstrate at least configural and metric invariance across selected student groups, with scalar invariance examined where supported by the data.

H3. Perceived learner choice and autonomy support will be positively associated with agentic beliefs, intentionality and goal-directedness, and strategic self-regulation (Assor et al., 2002; Patall et al., 2008; Reeve & Jang, 2006).

H4. Perceived dialogic teaching will be positively associated with dialogic participation (Howe & Abedin, 2013; Mercer & Littleton, 2007).

H5. Perceived formative feedback will be positively associated with strategic self-regulation and reflective ownership (Black & Wiliam, 1998; Butler & Winne, 1995; Nicol & Macfarlane-Dick, 2006).

H6. Perceived collaborative learning quality will be positively associated with collaborative influence (Johnson & Johnson, 2009; Kyndt et al., 2013).

H7. Reflective learning opportunities will be positively associated with reflective ownership (Boud et al., 1985; Gibbs, 1988).

H8. Participation in educational decision-making will be positively associated with intentionality and goal-directedness and with dialogic participation (Cook-Sather, 2006; Mitra, 2014).

Construct validity will additionally be examined by testing theoretically expected relationships between SLAS dimensions and established measures of agentic engagement, academic self-efficacy, autonomy, engagement, and student voice.

8. Methodology

8.1 Research Design, Participants, and Measures

The study will use a multi-stage instrument-development and validation design informed by established scale-development guidance (Boateng et al., 2018; DeVellis, 2017; Worthington & Whittaker, 2006). The process will include construct specification and item generation, expert review and cognitive pretesting, pilot testing with exploratory factor analysis (EFA), and confirmatory validation using CFA, reliability and validity assessment, structural equation modelling (SEM), and measurement-invariance testing.

The initial validation will focus on a clearly defined population of undergraduate students. Participants will be recruited from multiple institutions and disciplinary areas using stratified or cluster-based sampling where feasible. Eligibility criteria will include current enrollment, informed consent, and sufficient proficiency in the language of administration. A separate pilot sample will be used for EFA, followed by an independent main sample for CFA and SEM. Sample size will be determined using model-based power analysis or Monte Carlo simulation to ensure adequate power for the proposed factor structure, structural pathways, and subgroup comparisons.

The primary measure will be the Student Learning Agency Scale (SLAS), initially comprising approximately six items for each of six proposed dimensions: Agentic Beliefs, Intentionality and Goal-Directedness, Strategic Self-Regulation, Dialogic Participation, Collaborative Influence, and Reflective Ownership. Items will use a Likert-type response format.

Students will also report their perceptions of six student-centered pedagogical conditions: learner choice and autonomy support, dialogic teaching, formative feedback, collaborative learning, reflective learning opportunities, and participation in decision-making. Where appropriate, validated measures will be adapted and documented; newly developed items will undergo the same validation procedures as the SLAS.

To assess convergent and discriminant validity, established measures of related constructs will be included, such as agentic engagement, academic self-efficacy, self-regulated learning, behavioral or cognitive engagement, perceived autonomy, and student voice.

8.2 Instrument Development and Psychometric Validation

Initial SLAS items will be generated deductively from the theoretical definitions of the six agency dimensions and supplemented, where feasible, by qualitative input from students. An expert panel with expertise in educational psychology, student agency, pedagogy, and psychometrics will evaluate item relevance, clarity, and construct alignment. Cognitive interviews with students from the target population will then

examine item comprehension and identify ambiguity, redundancy, or conceptual overlap.

The revised item pool will be pilot tested before formal validation. EFA will be conducted using the pilot sample, with factor retention informed by parallel analysis, scree-plot evidence, theoretical interpretability, factor loadings, cross-loadings, and content coverage. Because the proposed dimensions are expected to correlate, an oblique rotation will be used.

The resulting factor structure will subsequently be tested in an independent sample using CFA. The proposed six-factor model will be compared with theoretically plausible alternatives, including a unidimensional model and, where justified, a higher-order agency model. Model evaluation will consider CFI, TLI, RMSEA, SRMR, standardized factor loadings, and residual diagnostics. Recommended cutoffs will be treated as interpretive guidelines rather than rigid decision rules (Hu & Bentler, 1999; Marsh et al., 2004).

Reliability will be evaluated primarily using McDonald's omega, supplemented where appropriate by coefficient alpha. Convergent validity will be examined through factor loadings, average variance extracted, and theoretically expected relationships with related constructs. Discriminant validity will be assessed using factor correlations, the heterotrait-monotrait ratio, and comparisons with conceptually adjacent constructs. Particular attention will be given to establishing whether SLAS dimensions are empirically distinguishable from autonomy, engagement, self-regulated learning, and agentic engagement.

Where sample size permits, measurement invariance will be examined across selected groups such as gender or disciplinary area. Configural, metric, and scalar invariance will be evaluated sequentially using changes in model fit and substantive interpretation (Chen, 2007; Cheung & Rensvold, 2002).

8.3 Structural Analysis, Data Quality, and Ethical Procedures

Following establishment of an acceptable measurement model, SEM will be used to test the hypothesized relationships between student-centered pedagogical practices and the dimensions of student learning agency. Only theoretically specified pathways will be treated as confirmatory hypotheses; any additional paths will be identified explicitly as exploratory. Because the initial design is cross-sectional, associations will not be interpreted as evidence of causal effects or developmental change.

Data screening will examine missingness, response patterns, implausibly short completion times, and other indicators of inattentive responding. Missing data will be handled using methods appropriate to the estimator and missing-data mechanism, including full-information maximum likelihood where suitable. Robust estimation procedures will be used when distributional assumptions are violated.

Ethical approval will be obtained prior to data collection. Participation will be voluntary and based on informed consent. Participants will be informed about the study purpose, confidentiality procedures, data management, and their right to

withdraw without penalty. Data will be anonymized or pseudonymized and stored securely in accordance with institutional and applicable data-protection requirements.

To strengthen transparency and reproducibility, the primary hypotheses and confirmatory analysis plan will be preregistered before formal testing. Statistical scripts, item-development documentation, and de-identified data will be shared where ethical and legal conditions permit. Confirmatory and exploratory analyses will be clearly distinguished, and all major planned model comparisons will be reported.

9. Planned Results and Reporting Strategy

No empirical data have yet been collected.

Accordingly, this section specifies the analyses and reporting structure planned for the validation study rather than presenting findings.

The final results will be organized in the following sequence.

Sample and descriptive statistics.

Participant flow, sample characteristics, descriptive statistics, internal-consistency estimates, and zero-order correlations will be reported.

Content validation and pilot analysis.

Expert evaluations of item relevance and clarity will be summarized, followed by exploratory factor analysis, including parallel-analysis results, factor loadings, cross-loadings, communalities, and factor correlations.

Confirmatory factor analysis.

The proposed six-factor model will be compared with theoretically plausible alternative models, including a unidimensional model and, where appropriate, a higher-order agency model. Model fit, standardized factor loadings, residuals, and reliability estimates will be reported.

Construct validity.

Convergent and discriminant validity will be evaluated using theoretically relevant relationships with agentic engagement, self-efficacy, self-regulated learning, autonomy, engagement, and student voice.

Structural model.

The hypothesized relationships between student-centered pedagogical practices and dimensions of learning agency will be estimated using structural equation modelling. Standardized coefficients and explained variance for each agency dimension will be reported.

Measurement invariance.

Where sample size permits, configural, metric, and scalar invariance will be examined across selected student groups.

Interpretation criteria will be specified before confirmatory analysis. However, hypotheses will not be judged solely through fixed statistical cutoffs. Model fit, effect

sizes, confidence intervals, theoretical coherence, and competing explanations will be considered together. Unsupported and unexpected findings will be reported transparently rather than omitted.

10. Discussion: Anticipated Contribution of the Empirical Test

Because the present manuscript is a research protocol, the discussion concerns the theoretical implications that different empirical patterns would have rather than interpreting results that do not yet exist.

If the proposed multidimensional structure is supported, the study would strengthen the argument that student learning agency is better understood as a set of related but distinguishable capacities rather than as a single undifferentiated characteristic. Such evidence would also provide a stronger basis for examining agency directly rather than inferring it from engagement, participation, autonomy, or other neighboring constructs.

Support for the hypothesized practice–agency relationships would provide evidence for a more mechanism-oriented account of student-centered pedagogy. Rather than treating learner choice, dialogue, feedback, collaboration, reflection, and participation as interchangeable indicators of student-centeredness, the framework proposes that different practices may be associated with different dimensions of agency.

Such findings could help explain why apparently similar student-centered reforms produce different outcomes. A classroom may, for example, emphasize group work without giving students meaningful influence, or provide choice without adequate guidance. The framework therefore shifts attention from the presence of student activity to the quality and function of pedagogical opportunities.

Equally important, unsupported hypotheses would be theoretically informative. If some proposed dimensions fail to separate empirically, or if particular practices do not relate to the predicted dimensions, the framework should be revised rather than protected. Validation is therefore treated as a test of the conceptual architecture, not as a procedure designed to confirm it.

The study may also contribute to debates concerning instructional guidance. SLAF does not assume that learner agency requires minimal teacher direction. Instead, it proposes that appropriately structured guidance may support agency when it expands students' opportunities to make informed decisions, regulate learning, participate meaningfully, and reflect on their actions.

11. Theoretical Contributions

The Student Learning Agency Framework is intended to make four principal theoretical contributions. First, construct clarification. SLAF distinguishes student learning agency from autonomy, engagement, self-regulated learning, participation, voice, and empowerment while recognizing their conceptual relationships. Second, multidimensional integration. The framework brings together insights from social cognitive theory, self-determination theory, self-regulated learning, and sociocultural perspectives within a single model of learning agency. Third, mechanism

specification. SLAF moves beyond broad claims that student-centered pedagogy promotes agency by proposing explicit, testable relationships between particular pedagogical practices and particular dimensions of agency. Fourth, reconceptualization of student-centeredness. The framework shifts attention from surface indicators of classroom activity toward the capacities that pedagogical environments may enable students to exercise. The principal contribution is therefore not the creation of another student-agency scale in isolation, but the development of an explanatory model linking pedagogical conditions to differentiated forms of agentic learning.

12. Pedagogical Implications

If supported empirically, SLAF would suggest that student agency is unlikely to emerge from any single teaching technique. Instead, it may depend on complementary pedagogical conditions. Meaningful choice should provide genuine but appropriately bounded decision-making opportunities. Dialogue should allow students' ideas and questions to influence classroom meaning-making. Formative feedback should help learners evaluate progress and adapt subsequent action. Collaboration should involve substantive interdependence rather than simple group assignment. Reflection should be intentionally structured, and participation in decision-making should involve consequential rather than symbolic student voice. The framework therefore cautions against equating student-centeredness with reduced teacher guidance. Agency-supportive pedagogy may require considerable teacher expertise in designing structures that combine autonomy with scaffolding, participation with accountability, and choice with clear educational purposes. At an institutional level, a validated SLAS could potentially support curriculum evaluation, professional development, and research on whether different learning environments provide comparable opportunities for agentic participation. Such uses, however, should follow evidence of adequate reliability and validity rather than be assumed in advance.

13. Limitations

Several limitations should be acknowledged; First, this manuscript is a research protocol; its theoretical propositions have not yet been empirically validated. Second, the proposed study relies primarily on student self-report, which may not fully capture observed classroom practice or actual agentic behavior. Third, the initial design is primarily cross-sectional, limiting causal inference. Associations between pedagogy and agency cannot establish that pedagogical practices cause agency development. Fourth, agency may be strongly context-dependent. A student may act agentially in one course but not another, meaning that generalized self-report measures may obscure situational variation. Fifth, the proposed six-dimensional structure is provisional. Some dimensions may overlap more strongly than expected or may be better represented as antecedents or consequences rather than components of agency. Finally, the initial framework focuses primarily on student-level perceptions and capacities and gives less attention to teacher agency, institutional

structures, and broader sociocultural conditions that may shape opportunities for student action.

14. Future Research

Several directions should follow initial validation; Longitudinal research should examine whether student agency changes over time and whether exposure to particular pedagogical conditions predicts such change. Experimental and quasi-experimental studies could test whether modifying specific pedagogical practices leads to changes in agency dimensions. Mixed-methods research combining survey data with classroom observation, discourse analysis, and student interviews could examine how agency is enacted in specific learning situations. Cross-cultural research should investigate whether SLAF operates similarly across educational systems and sociocultural contexts. Future studies should also examine digital and AI-mediated environments, where automated feedback, adaptive systems, and algorithmic support may simultaneously expand and constrain learner agency. Finally, multilevel research should investigate how teacher practices, classroom norms, and institutional structures interact with individual learner characteristics in shaping agency.

15. Conclusion

Student-centered pedagogy is frequently justified by the expectation that learners should become more capable of directing, regulating, and influencing their own learning. Yet the mechanisms connecting particular pedagogical practices to particular forms of student agency remain insufficiently specified. The Student Learning Agency Framework addresses this problem by conceptualizing learning agency as a multidimensional, contextually situated construct and by proposing explicit relationships between six student-centered pedagogical practices and six dimensions of agency. The framework does not assume that these relationships are established. Rather, it provides a theoretical model and validation strategy through which they can be tested empirically. Its central contribution is therefore to move the student-centered paradigm from a broad pedagogical orientation toward a more precise and falsifiable question:

Which educational practices enable students to become more intentional, strategic, reflective, participatory, and influential in their own learning?

If supported empirically, SLAF could provide a stronger theoretical and measurement foundation for studying student-centered pedagogy across educational contexts.

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