Self-Directed Learning in Higher Education: An Integrated Mixed-Methods Study

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ABSTRACT

This study examined self-directed learning competence in undergraduate students through an integrated mixed-methods design. The qualitative phase included semi-structured interviews with six students identified as competent in self-directed learning; the quantitative phase administered a 30-item Likert scale to 50 employed students (mean age 24.3 years; 56% female). Cronbach's alpha analyses revealed acceptable reliability for personal motivations ($\alpha = 0.849$) and social skills ($\alpha = 0.677$), though cognitive competencies showed limitations ($\alpha = 0.485$). Thematic analysis of interviews identified that self-directed learning emerges from personal initiative, depends on intrinsic motivation and preexisting abilities, and varies by disciplinary context. The findings suggest that personal motivations, persistence, and self-regulation are key antecedents of self-directed learning in university contexts. Implications for curriculum design and future research are discussed.

Keywords: self-directed learning, competencies, higher education, motivation, self-regulation

INTRODUCTION

Context and relevance

Global educational transformation demands that higher education institutions cultivate autonomous learners capable of self-regulating their learning processes. When students assume active participation as agents of their own learning, they develop metacognition, self-awareness, and tools to address complex and changing contexts (Knowles, 1975; Zimmerman, 2000).

In Mexico, despite progress in international assessments, significant challenges persist. El Colegio de México reported that approximately half of adolescents lack basic competencies to meet everyday demands (Servín, 2014). This context motivated recent educational reforms: the Comprehensive Reform of Upper Secondary Education (RIEMS, 2008) and the New Mexican School (NEM, 2019), both prioritizing self-directed learning as a cross-cutting axis.

Competency-based education emphasizes not merely what a student knows, but how that knowledge is applied in authentic contexts. To achieve this, understanding the psychological, motivational, and contextual mechanisms underlying self-directed learning in higher education is essential.

Research objectives

To characterize how undergraduate students perceive and deploy self-directed learning

To identify cognitive, motivational, and social factors associated with competence in self-directed learning

To integrate qualitative and quantitative findings to propose a descriptive model of self-directed learning in university contexts

THEORETICAL FRAMEWORK

Definition and conceptualization

Self-directed learning is a systematic process encompassing cognitive, conative, and behavioral dimensions (Knowles, 1975). In this process, the learner assumes initiative to diagnose learning needs, formulate objectives, identify resources, and apply learning strategies while reflexively evaluating outcomes.

Merriam and Caffarella (1999) emphasize that self-directed learning is context-dependent: an individual may be autonomous in certain disciplinary domains but not in others, depending on prior knowledge, motivations, and situational factors.

For this study, the following operational definition is adopted:

Self-directed learning is a self-regulated, learner-initiated process in which cognitive competencies (analysis, synthesis, evaluation), intrinsic motivations (interest, curiosity, personal goals), and socioemotional skills (communication, persistence, receptivity to feedback) are combined, enabling autonomous acquisition of knowledge, skills, and attitudes transferable to diverse contexts.

Influential theoretical models

Knowles (1975) characterizes self-directed learning through: individual initiative, diagnosis of needs, formulation of objectives, identification of resources, selection of strategies, and self-evaluation.

Guglielmino (1977) identifies eight factors characterizing competent autonomous learners: openness to learning, positive self-concept as a learner, initiative and independence, informed acceptance of responsibility, love of learning, creativity, future orientation, and problem-solving ability.

Zimmerman (2000) emphasizes self-regulation as a cyclical process: goal setting, metacognitive monitoring, strategic adjustment, and reflection on outcomes.

Merriam and Caffarella (1999) stress the contextual and situated nature of self-directed learning, rejecting conceptions of absolute universal autonomy.

Recent research

Díaz Vásquez (2024) demonstrated that flipped classroom methodologies facilitate self-directed learning, particularly in pre-class phases. Moreno Betancourt (2024) found that techniques such as active reading, summaries, and graphic organizers improve academic performance. Olguín-Guzmán (2024) emphasizes that both face-to-face and virtual environments require explicit structuring of goals, activity planning, and continuous feedback to consolidate effective self-directed learning.

METHODOLOGY

General design

An integrated sequential mixed-methods design was employed (qualitative → quantitative), wherein qualitative findings informed the construction of quantitative instruments.

Qualitative phase: Case study

Participants: Six undergraduate students (mean age 23.5 years; 50% female) identified by peers and instructors as competent in self-directed learning. Inclusion criteria: (a) superior academic performance (GPA ≥ 3.5/4.0), (b) evidence of metacognitive self-regulation, (c) documented participation in independent learning activities. Exclusion criteria: (a) academic probation status, (b) undisclosed cognitive disability diagnoses.

Data collection: Semi-structured interviews (45–60 minutes) with 8 predetermined questions:

Do you perceive yourself as competent in self-directed learning?

How do you describe yourself in terms of mastery? (strengths and limitations)

Can you provide specific examples of using this competence?

How did you develop this competence?

What motivated you to develop it?

Where will you direct future learning efforts?

What evidence demonstrates your self-directed learning?

What level of satisfaction do you report with your performance?

Interviews were audio-recorded (with consent), transcribed verbatim, and coded using inductive thematic analysis following Braun and Clarke (2006) procedures.

Qualitative analysis: Two researchers independently coded 100% of transcripts to ensure reliability. First-order themes (codes emergent from text) and second-order themes (conceptual groupings) were established. Consensus was achieved through iterative discussion. Disagreements were documented (Cohen's kappa: 0.82).

Ethical approval: The protocol was approved by the institutional ethics committee.

Quantitative phase: Survey

Participants: 50 undergraduate students in distance education (age range 19–31 years, M = 24.3, SD = 3.2; 22 males = 44%, 28 females = 56%; all employed). Sampling: non-probabilistic purposive. Location: Irapuato, Guanajuato. Inclusion criteria: (a) enrolled in higher education, (b) age ≥ 18 years, (c) informed consent provided. Exclusion criteria: (a) age < 18 years, (b) inability to complete instrument.

Instrument: A 30-item Likert scale organized into three dimensions of 10 items each:

Cognitive competencies ($\alpha = 0.485$): metacognitive self-regulation, critical thinking, problem-solving (e.g., "I critically analyze information before integrating it into my learning")

Personal motivations ($\alpha = 0.849$): academic goals, intrinsic interest, persistence (e.g., "My learning objectives align with my personal interests")

Social skills ($\alpha = 0.677$): communication, openness to feedback, collaboration (e.g., "I seek peer feedback to improve my performance")

Response scale: 4 points (1 = Strongly disagree; 4 = Strongly agree). Score ranges: 10–40 per dimension, 30–120 globally.

Instrument development: Items were generated from (a) theoretical literature on self-directed learning, (b) preliminary qualitative thematic analysis, and (c) review by five experts in higher education. A pilot test with 15 students was conducted; item analyses were performed and items with item-total correlation < 0.30 were eliminated.

Administration: In-class administration (15–20 minutes). One hundred percent of participants completed the entire scale; no missing data.

Quantitative analyses: SPSS 26.0 was used. Descriptive statistics (M, SD, range), reliability analysis (Cronbach's alpha), correlational analysis (Pearson), and analysis of variance (ANOVA) for gender comparisons are reported. Given sample size and distribution, assumptions of normality (Shapiro-Wilk) and homogeneity of variance (Levene's test) were verified.

Triangulation

Qualitative and quantitative findings were integrated through systematic comparison: emergent themes from interviews were compared with dimensions of the Likert scale, identifying convergences, divergences, and complementarities.

RESULTS

Qualitative results

Theme 1: Self-perception of competence

All six interviewees reported perceiving themselves as competent in self-directed learning, though with important nuance: all acknowledged differentiated mastery according to disciplinary contexts. One participant noted: "In methodology courses I feel I control my learning well, but in mathematics I still depend heavily on tutoring." This pattern confirms Merriam and Caffarella's (1999) findings on context-dependency.

Theme 2: Origins of self-directed learning

Three participants attributed development to family factors ("values of responsibility instilled at home"), two negative prior academic experiences that promoted autonomy, and one to specific professional motivations. One participant stated: "When I entered university, I realized no one was going to teach me everything; I had to seek resources on my own."

Theme 3: Role of motivations

All interviewees emphasized that intrinsic motivations (curiosity, long-term personal goals) sustained persistent effort. When asked about obstacles, five mentioned that original motivations were critical for overcoming difficulties: "If you don't really care about the topic, it's hard to keep learning when things get complicated."

Theme 4: Strategies employed

Participants described combinations of strategies: self-directed resource seeking (books, videos, online tutorials), temporal organization of activities, reflection on errors, and requesting feedback from instructors and peers. One participant highlighted: "After each exam, I sit down and write what I didn't understand so I can address that later."

Quantitative results

Descriptive statistics by dimension:

Dimension	M	SD	Observed range	Possible range
Cognitive Competencies	29.4	4.2	18–38	10–40
Personal Motivations	34.8	3.6	24–40	10–40
Social Skills	32.1	4.1	20–40	10–40
Global Score	**96.3**	**9.8**	**68–119**	**30–120**

Participants showed higher scores on Personal Motivations (M = 34.8), followed by Social Skills (M = 32.1). Cognitive Competencies showed the greatest relative variability (CV = 14.3%), suggesting heterogeneity in metacognitive regulation.

Reliability analysis

Personal Motivations: $\alpha = 0.849$ (excellent)

Social Skills: $\alpha = 0.677$ (acceptable)

Cognitive Competencies: $\alpha = 0.485$ (questionable)

The low reliability of the cognitive scale suggests that the 10 items do not coherently capture unidimensional construct. Post-hoc item analysis revealed that three items (20, 14, 7) demonstrated item-total correlations < 0.25. This indicates a problematic operationalization of cognitive competencies requiring attention in future research.

Correlations between dimensions:

Relationship	r	p
Cognitive ↔ Motivations	0.34	0.018
Cognitive ↔ Social	0.28	0.052
Motivations ↔ Social	0.61	< 0.001

The strong correlation between Personal Motivations and Social Skills ($r = 0.61$, $p < 0.001$) suggests that students with clear goals actively seek peer and instructor feedback. The weaker correlation between Cognitive Competencies and other dimensions may reflect the reliability problems identified.

Analysis by Gender

One-way ANOVA compared scores by gender:

Dimension	Males (M, SD)	Females (M, SD)	F	p
Cognitive	29.0 (4.5)	29.7 (4.0)	0.38	0.537
Motivations	34.2 (3.9)	35.2 (3.4)	1.24	0.271
Social	31.4 (4.3)	32.6 (3.9)	1.68	0.201
Global	94.6 (10.8)	97.5 (9.0)	1.06	0.309

No significant gender differences were detected in any dimension (all $p > 0.05$), partially aligning with recent findings but diverging from some prior research.

Qualitative-quantitative integration

Triangulation revealed convergences and complementarities:

Convergence: The themes of "personal motivations" and "origins of self-directed learning" in qualitative analysis aligned with the quantitative Personal Motivations dimension (M = 34.8), underscoring the centrality of intrinsic motivation. Both data phases emphasize that personal initiative is a prerequisite.

Complementarity: Qualitative data provided explanatory mechanisms absent in quantitative data. For example, while Motivations and Social Skills correlate (r = 0.61), interviews revealed that seeking feedback is a deliberate strategy to sustain motivation during adversity.

Divergence: The low reliability of Cognitive Competencies contrasts with the sophistication of metacognitive strategies described in interviews. This suggests that operationalization of cognitive constructs requires conceptual refinement.

DISCUSSION

Integrative synthesis

Self-directed learning in higher education emerges as a multidimensional phenomenon integrating cognitive, motivational, and socioaffective dimensions. The findings suggest a model wherein:

Personal motivations constitute the primary engine: Students with clear goals, intrinsic curiosity, and sustained persistence demonstrate greater self-directed learning competence. This supports self-determination theories (Ryan & Deci, 2000) in adult educational contexts.

Social skills amplify individual self-regulation: Seeking feedback, willingness to collaborate, and effective communication enable individuals to transcend personal cognitive limitations through access to collective knowledge.

Cognitive competencies require improved operationalization: Data suggest that measures of metacognitive self-regulation must capture not only metacognitive knowledge but observable performance of monitoring and strategic adjustment.

Theoretical implications

The results refine prior conceptualizations of self-directed learning. While Knowles (1975) emphasized initiative as a defining element, this study underscores that initiative without intrinsic motivational substrate generates superficial and unsustained self-directed learning. Contextual variability (domain-specific autonomy) supports Merriam and Caffarella (1999) and highlights the futility of universal autonomy conceptions.

Practical implications for higher education

For instructors: Course design should include explicit phases of (a) connecting content to students' personal goals, (b) modeling metacognitive strategies, and (c) structuring peer and instructor feedback opportunities.

For curriculum design: Transversal competencies such as self-directed learning require deliberate integration across multiple courses with clear learning objectives alignment. RIEMS and NEM in Mexico have identified this need; operational implementation requires instructor training and reconfiguration of learning spaces.

For virtual environments: Given the prevalence of distance education (the sample included online students), educational platforms must facilitate resource seeking, task organization, metacognitive reflection, and asynchronous feedback.

Study limitations

Limited external validity: Non-probabilistic sampling with N = 50 in a single geographic location restricts generalization. All participants were employed; results may not transfer to full-time students.

Cognitive competencies reliability: The Cronbach's alpha of 0.485 indicates that items do not adequately capture the construct. Future research must redesign this scale through item analysis and validation with independent samples.

Cross-sectional design: Data were collected at a single time point. Longitudinal designs would allow examination of self-directed learning development trajectories.

Absence of contextual variables: The study did not capture institutional climate, teaching quality, academic load, or access to technological resources—factors likely moderating self-directed learning.

Limited qualitative sample: Although six cases suffice for case study research, larger qualitative samples wouldenable more robust conceptual saturation.

Future directions

Replicate the study with stratified samples (in-person students, online students, full-time students, multiple institutions) to improve external validity.

Redesign the cognitive competencies scale incorporating observable indicators of metacognitive monitoring (e.g., reflection journals, self-generated concept maps).

Conduct longitudinal studies tracing self-directed learning evolution across undergraduate careers.

Investigate implementation mechanisms of reforms such as NEM that cite self-directed learning as priority; examine policy-practice gaps.

Explore the role of educational technologies (AI tutors, learning management platforms) as facilitators of self-directed learning in distance education.

Perform quasi-experimental research comparing effectiveness of pedagogical interventions specifically designed to develop metacognitive competencies of self-directed learning.

CONCLUSIONS

This study provided integrated evidence that self-directed learning in higher education is a multidimensional process primarily sustained by intrinsic personal motivations, amplified by socioaffective skills, and expressed through metacognitive competencies. Findings support the priority given to self-directed learning in recent Mexican educational reforms while underscoring the need for clear operationalization in educational practice.

The integrated mixed-methods approach enabled capturing both qualitative underlying mechanisms (how and why students develop self-directed learning?) and quantitative population profiles. However, results must be interpreted within identified methodological limitations.

Future research must address contextual heterogeneity, refine psychometric instrumentation, and examine longitudinal trajectories to consolidate a rigorous science of self-directed learning in higher education that informs educational policy and teaching practice with empirical rigor.

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CONFLICTS OF INTEREST

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