



An Empirical Examination of Philosophical Cognition and Learning-Curve Performance

Abstract

The relationship between philosophy and learning is increasingly important in educational environments characterised by rapid technological change, complex knowledge demands and continuous adaptation. This study examined the extent to which philosophical inquiry, critical reflection, epistemic openness, reflective thinking and intellectual curiosity influence learning-curve performance. The study adopted a quantitative, cross-sectional research design and analysed 880 observations using descriptive statistics, reliability analysis, Pearson product-moment correlation and multiple regression. Data were conceptualised through five-point Likert-scale measures. The results indicated satisfactory internal consistency across all constructs, with Cronbach's alpha coefficients ranging from .884 to .920. Descriptive results showed generally positive perceptions of philosophical cognition and learning-curve performance. Correlation analysis revealed positive and statistically significant relationships between philosophical inquiry, critical reflection, epistemic openness, reflective thinking, intellectual curiosity and learning-curve performance. Multiple regression produced an R of .764 and an R^2 of .584, indicating that the five philosophical dimensions jointly explained 58.4% of the variance in learning-curve performance. Intellectual curiosity produced the largest standardised regression coefficient ($\beta = .284$, $p < .001$), followed by philosophical inquiry ($\beta = .206$, $p < .001$), reflective thinking ($\beta = .206$, $p < .001$), critical reflection ($\beta = .203$, $p < .001$) and epistemic openness ($\beta = .177$, $p < .001$). The findings suggested that philosophical engagement is statistically associated with the capacity to acquire, evaluate, revise and apply knowledge. The study contributed to the philosophy-of-learning literature by conceptualising learning as an iterative cognitive process rather than merely an accumulation of information.

Keywords: philosophy, learning curve, inquiry, critical reflection, epistemic openness, intellectual curiosity, reflective thinking.

Ukpong Uwem Johnson

Department of Public Administration,
University of Calabar, Cross River, Calabar,
Nigeria. ORCID:0000-0002-7549-4098; E-
mail:uwemjohnson5@unical.edu.ng

Christopher Akpotu

Department of Business Administration, Niger
Delta University, Amassoma, Bayelsa State,
Nigeria. ORCID:0000-0003-3261-7040; E-mail:
chrisakpotu4u@ndu.edu.ng

Otu Offiong Duke

Department of Public Administration,
University of Calabar, Cross River, Nigeria.
ORCID:0000-0002-0092-3708; E-
mail:otuduke76@unical.edu.ng

Cristiana Okon Umoren

Department of Business Education, University
of Calabar, Cross River, Nigeria. ORCID:0009-
0008-5286-8190; E-mail:
iniewechristiana@gmail.com

Bayo Princewill Lekara

Department of Business Administration, Rivers
State University, Rivers, Nigeria. ORCID:0000-
0002-0205-6476; E-
mail:bayo.princewill@ust.edu.ng

Okon Unwana Ita

Department of Public Administration,
University of Calabar, Cross River, Nigeria.
ORCID:0000-0001-6372-256X; E-
mail:unwanaita2025@unical.edu.ng

Gregory Victoria Omonfoman

Department of Public Administration,
University of Calabar, Cross River, Nigeria.
ORCID:0009-0000-8773-4573; E-
mail:vicomfonfoman@gmail.com

Date Received: 27th September, 2026

Date Accepted: 29th September, 2026

Introduction

Learning extends beyond the accumulation of information because it involves interpretation, reasoning, experience, reflection, adaptation and

transformation of existing knowledge structures (Dewey, 1910, 1933; Piaget, 1972; Vygotsky, 1978; Bruner, 1960; Ausubel, 1968; Bandura, 1986; Ukpong *et al.*, 2026). Contemporary learning theory

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emphasises that learners actively construct knowledge through interaction with their environments, previous experiences and social contexts (Piaget, 1952; Vygotsky, 1978; Bruner, 1996; Kolb, 1984; Lave & Wenger, 1991). Recent evidence from neuroscience similarly suggests that active learning engages learner agency, curiosity, novelty, social interaction and self-evaluation in ways that can strengthen retention and higher-order thinking (Dubinsky & Hamid, 2024; Ukpong *et al.*, 2026). The learning curve captures this progressive development by describing changes in performance as individuals acquire experience, competence and task familiarity (Wright, 1936; Yelle, 1979; Dutton & Thomas, 1984; Argote & Epple, 1990; Argote, 2013). Learning-curve effects are consequently relevant to education, professional development, organisational learning and continuous competence development (Anzanello & Fogliatto, 2011; Jaber, 2016; Ritter *et al.*, 2013; Lieberman, 1984; Adler & Clark, 1991).

The philosophical dimension of learning concerns fundamental questions surrounding knowledge, truth, evidence, reason, values, experience and uncertainty (Russell, 1946; Popper, 1959; Kuhn, 1962; Rorty, 1979; Habermas, 1984; Gadamer, 2004; Ukpong *et al.*, 2018; Ukpong *et al.*, 2019). Philosophy encourages learners to interrogate assumptions, evaluate arguments, distinguish evidence from assertion and reconsider established interpretations (Socrates, 1997; Plato, 1992; Kant, 1998; Mill, 1974; Peirce, 1934; James, 1975).

Such intellectual activity is closely related to critical thinking, which involves interpretation, analysis, evaluation, inference and explanation (Ennis, 1987; Facione, 1990; Paul & Elder, 2008; Halpern, 2014; Brookfield, 2012; Ukpong *et al.*, 2018; Ukpong *et al.*, 2019). Contemporary research increasingly conceptualises learning itself as an epistemic activity in which learners engage with evidence, explanations and competing knowledge claims rather than merely receive information (Richter & Tiffin-Richards, 2024). Recent scholarship on epistemic performance similarly connects epistemic thinking with cognition, metacognition, reasoning and the evaluation of information sources, including the credibility of digital information (Barzilai & Zohar, 2024). Philosophical inquiry may therefore create cognitive conditions that support deeper and more adaptive learning (Lipman, 2003; Siegel, 1988; Nussbaum, 1997; Splitter & Sharp, 1995; Fisher, 2001).

Reflective thinking provides another important connection between philosophy and learning. Dewey (1933) conceptualised reflection as systematic examination of beliefs and their supporting grounds, while Schön (1983) distinguished between reflection-in-action and reflection-on-action. Mezirow (1991) subsequently associated critical reflection with transformative learning, and Boud *et al.* (1985) emphasised reflection as a mechanism for learning from experience. Kolb's (1984) experiential learning model similarly proposes movement between concrete

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experience, reflective observation, abstract conceptualisation and active experimentation. Recent educational research continues to demonstrate the importance of structured reflection for connecting experience, interpretation and professional learning (Machost & Stains, 2023). Research on reflective learning has further shown that prompts and feedback can encourage learners to make more sophisticated interpretations, use wider bodies of knowledge and draw stronger conclusions for professional development (Schellenbach-Zell, 2023). These perspectives suggest that learning improves when individuals critically examine experience rather than merely repeat behaviour (Eraut, 2004; Moon, 2004; Reynolds, 1998; Raelin, 2002; Ukpong *et al.*, 2020).

The contemporary knowledge environment strengthens the importance of philosophical learning. Digital technologies, artificial intelligence, information abundance and rapidly changing professional knowledge require learners to evaluate sources, recognise uncertainty and revise conclusions when evidence changes (Siemens, 2005; Floridi, 2014; Selwyn, 2019; Luckin *et al.*, 2016; Zawacki-Richter *et al.*, 2019; UNESCO, 2021; Holmes *et al.*, 2019). Recent research on epistemic cognition reinforces this concern by showing that learners' conceptions of knowledge influence how they evaluate, justify and apply knowledge across educational contexts (DeGlopper & Stowe, 2024; Ukpong *et al.*, 2020; Ukpong *et al.*, 2026). Contemporary epistemic frameworks likewise

emphasise the importance of evaluating the validity of claims, the trustworthiness of sources and the conditions under which knowledge can be justified (Barzilai & Zohar, 2024). Authentic learning activities have also been associated with changes in students' epistemic beliefs, suggesting that learning environments can shape how individuals understand knowledge and evidence (Nachtigall & Firstein, 2024; Johnson *et al.*, 2026). Epistemic openness is therefore increasingly significant because effective learning requires willingness to consider alternative explanations and update knowledge when evidence changes (Hofer & Pintrich, 1997; Greene *et al.*, 2008; Chinn *et al.*, 2014).

Intellectual curiosity similarly stimulates exploration, questioning and sustained engagement with unfamiliar problems (Berlyne, 1960; Loewenstein, 1994; Kashdan *et al.*, 2004; Jirout & Klahr, 2012). Recent research has provided further empirical support for the educational relevance of curiosity. Singh and Manjaly (2022), for example, examined curiosity as a mechanism for improving learning outcomes, while contemporary neuroscience research identifies curiosity and novelty as important components of active learning and knowledge retention (Dubinsky & Hamid, 2024; Ukpong *et al.*, 2020). Curiosity can consequently be understood not simply as a personality disposition but as a cognitive-motivational mechanism that stimulates information seeking, exploration and deeper engagement with knowledge. This perspective is particularly relevant to

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philosophical inquiry because philosophical learning is fundamentally concerned with questioning what is known, identifying what remains uncertain and investigating alternative explanations.

This study conceptualises learning-curve performance as progressive improvement in knowledge acquisition, comprehension, problem-solving, adaptation and application. It empirically examines whether philosophical inquiry, critical reflection, epistemic openness, reflective thinking and intellectual curiosity significantly predict learning-curve performance across 880 observations. The study therefore positions philosophy not merely as an academic discipline but as a cognitive orientation capable of shaping how individuals question, interpret, evaluate, revise and apply knowledge. This conceptualisation is consistent with contemporary perspectives that regard learning as an active, epistemic and reflective process in which agency, curiosity, critical evaluation and knowledge revision contribute to intellectual development (Richter & Tiffin-Richards, 2024; DeGlopper & Stowe, 2024; Barzilai & Zohar, 2024; Dubinsky & Hamid, 2024; Ukpong *et al.*, 2026). The study consequently extends the conventional understanding of the learning curve from a predominantly experience-performance relationship towards a broader cognitive framework in which philosophical engagement may contribute to progressive learning and performance development.

Conceptualisation of Philosophy and the Learning Curve

Philosophy is broadly understood as systematic and critical inquiry into fundamental questions concerning reality, knowledge, truth, values, reasoning, existence and human experience (Russell, 1946). Etymologically associated with the pursuit of wisdom, philosophy is not restricted to abstract speculation but represents an intellectual disposition through which individuals interrogate assumptions, examine arguments, evaluate evidence and seek rationally defensible explanations (Dewey, 1910; Peirce, 1934; Popper, 1959). Within educational contexts, philosophy consequently extends beyond the formal study of philosophical doctrines. It can function as a mode of learning characterised by questioning, dialogue, reasoning, reflection, interpretation and intellectual self-examination (Lipman, 2003; Siegel, 1988; Nussbaum, 1997). Philosophical engagement may therefore influence how learners approach uncertainty, distinguish justified knowledge from unsupported claims and reconsider established interpretations when confronted with new evidence (Kuhn, 1962; Habermas, 1984; Gadamer, 2004; Facione, 1990).

The concept of the learning curve originates substantially from attempts to explain how performance changes as experience accumulates. Wright (1936) demonstrated that the labour required to produce aircraft tended to decline as cumulative production increased, thereby

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establishing an influential foundation for subsequent learning-curve research. Later studies extended this principle to manufacturing, organisational routines, professional expertise, education and skill acquisition (Yelle, 1979; Dutton & Thomas, 1984; Argote & Epple, 1990; Argote, 2013; Ukpong *et al.*, 2026). The learning curve therefore represents a relationship between accumulated experience and changes in performance. Although early formulations emphasised time, productivity and repetition, contemporary interpretations recognise that learning can involve cognitive development, behavioural adaptation, knowledge integration, problem-solving and experiential transformation (Kolb, 1984; Anzanello & Fogliatto, 2011; Jaber, 2016). The learning curve is consequently not necessarily linear because performance can be affected by task complexity, prior knowledge, motivation, feedback, organisational context and opportunities for reflection (Ericsson *et al.*, 1993; Senge, 1990; Salas *et al.*, 2012).

In this study, learning-curve performance is conceptualised as the perceived rate and quality with which individuals improve their knowledge, comprehension, skills, problem-solving capacity, adaptability and application of acquired knowledge. This conceptualisation incorporates both the process and outcome dimensions of learning. The process dimension concerns how learners engage with experience, information and feedback, whereas the outcome dimension concerns observable or perceived improvements in competence

and performance (Bandura, 1986; Schön, 1983; Kolb, 1984). Learning is therefore treated as iterative rather than purely cumulative. Individuals encounter problems, formulate interpretations, examine evidence, receive feedback, revise understanding and subsequently apply new knowledge to related situations (Dewey, 1933; Mezirow, 1991; Boud *et al.*, 1985; Moon, 2004). Such iteration is fundamental to the idea of a learning curve because improvement emerges through repeated cycles of experience, interpretation, correction and application.

The relationship between philosophy and the learning curve can consequently be conceptualised as a cognitive mechanism through which philosophical dispositions influence how individuals engage with learning experiences. Philosophical inquiry provides the questioning mechanism through which learners identify problems and seek explanations (Dewey, 1910; Lipman, 2003). Critical reflection facilitates examination of assumptions, arguments and evidence (Ennis, 1987; Brookfield, 2012). Epistemic openness permits individuals to acknowledge uncertainty and revise beliefs when confronted with credible evidence (Hofer & Pintrich, 1997; Chinn *et al.*, 2014). Reflective thinking enables learners to transform experience into conceptual understanding and improved action (Schön, 1983; Kolb, 1984). Intellectual curiosity sustains exploration, investigation and engagement with unfamiliar knowledge (Berlyne, 1960; Loewenstein, 1994; Kashdan *et al.*, 2004).

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Collectively, these dimensions may strengthen the capacity of learners to move from initial uncertainty towards progressively higher levels of understanding, competence and performance. Philosophy is therefore conceptualised in this study not merely as knowledge about philosophers but as an intellectual orientation that potentially shapes the manner, depth and adaptability of learning.

Theoretical Foundation

The theoretical foundation integrates Dewey's reflective thought, Kolb's experiential learning, Schön's reflective practice and contemporary epistemic cognition. Together, these perspectives conceptualise learning as active inquiry involving experience, reflection and knowledge transformation (Dewey, 1910, 1933; Kolb, 1984; Schön, 1983; Hofer & Pintrich, 1997). Learning involves acquisition, evaluation, justification and transformation of knowledge rather than accumulation (Richter & Tiffin-Richards, 2024; Ukpong *et al.*, 2026). Learning also involves reconstructing knowledge through experience and engagement (Piaget, 1972; Vygotsky, 1978; Bruner, 1996). Epistemic beliefs influence knowledge application across contexts (DeGlopper & Stowe, 2024). This foundation supports examining active philosophical inquiry, critical reflection, epistemic openness, reflective thinking and intellectual curiosity as determinants of learning-curve performance (Brookfield, 2017; King & Kitchener, 1994; Kuhn, 1999; Ukpong *et al.*, 2020).

Dewey's theory explains learning through inquiry. Reflection involves active and careful consideration of beliefs, evidence and consequences (Dewey, 1910, 1933), while problematic experience stimulates inquiry (Dewey, 1938). Reflective learners question assumptions, examine evidence and reconstruct understanding (Mezirow, 1991; Moon, 2004). This corresponds with philosophical inquiry through questioning and evaluation (Lipman, 2003; Paul & Elder, 2014). Structured reflection enables learners to extract knowledge from experience (Bui & Yasri, 2023), while research indicates that reflective thinking varies across collaborative-learning stages rather than uniformly (2023). Dewey's perspective connects philosophical engagement with systematic investigation and learning-curve improvement (Dewey, 1933; Facione, 1990).

Kolb's theory conceptualises learning through concrete experience, reflective observation, abstract conceptualisation and active experimentation (Kolb, 1984). Experience becomes meaningful when learners reflect, construct interpretations and test them through action (Kolb & Kolb, 2005). Experiential cycles facilitate adaptation and performance improvement (Jarvis, 2006; Illeris, 2007). Experiential learning connects experience with conceptual understanding (Bui & Yasri, 2023). Critical reflection supports this transition, while epistemic openness encourages reconsideration when evidence contradicts existing explanations (Boud *et al.*, 1985; Mezirow,

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1991). Learning-curve improvement consequently therefore depends on interpreting feedback, revising assumptions and adapting action.

Schön's reflective-practice theory distinguishes reflection-in-action from reflection-on-action (Schön, 1983, 1987). Reflection-in-action enables responses to unexpected situations, whereas reflection-on-action involves retrospective examination. Both processes help learners identify discrepancies between expectations and outcomes and modify subsequent behaviour (Eraut, 2004; Finlay, 2008). Reflective practice transforms errors and uncertainty into resources for improvement (Fook & Gardner, 2007; Thompson & Pascal, 2012). Research further indicates that reflective thinking changes with learning activities, interaction patterns and collaborative stages (2023), while experiential-learning scholarship stresses deliberate scaffolding for interpretation (Bui & Yasri, 2023). Schön therefore explains how experience can become improved professional performance.

Epistemic cognition explains how individuals understand knowledge, evidence, certainty and justification (Hofer & Pintrich, 1997; Greene *et al.*, 2008). Sophisticated epistemic beliefs support evaluation of competing claims and revision when evidence changes (King & Kitchener, 1994; Chinn *et al.*, 2014). Contemporary research identifies developmental, dimensional and resources-based approaches to knowledge and knowing (DeGlopper &

Stowe, 2024). Learning is likewise an epistemic activity involving acquisition, justification and evaluation (Richter & Tiffin-Richards, 2024). Epistemic openness encourages intellectual flexibility (Kuhn, 1999; Muis, 2007), particularly in digital environments containing competing information. AI-education research consequently emphasises critical thinking and AI literacy so learners interrogate technological outputs (Walter, 2024).

Intellectual curiosity provides another mechanism linking philosophy and learning. Curiosity stimulates information seeking, questioning and exploration (Berlyne, 1960; Loewenstein, 1994). Research associates curiosity with learning and memory while distinguishing it from interest (van Duijvenvoorde *et al.*, 2021; Donnellan *et al.*, 2022). Educational environments can cultivate curiosity through relevance, information gaps, coherence and motivation (Singh & Manjaly, 2022). Curiosity is also associated with metacognitive processes involving information seeking and uncertainty reduction (Goupil & Proust, 2023), while explanation-seeking can direct learners towards useful questions (Lombrozo & Liquin, 2023).

Collectively, these theories indicate that learning-curve performance depends on questioning, interpretation, evaluation, reflection and knowledge transformation (Argyris & Schön, 1978; Hattie & Timperley, 2007; Zimmerman, 2002). The framework links reflection with

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experiential learning, epistemic cognition with knowledge evaluation, curiosity with information acquisition and critical thinking with responsible engagement with AI-mediated knowledge. It consequently conceptualises philosophical inquiry, critical reflection, epistemic openness, reflective thinking and intellectual curiosity as interconnected mechanisms underlying

progressive performance. Philosophy thus functions not merely as an academic subject but as intellectual activity through which learners interrogate experience, evaluate knowledge, revise understanding and develop professional competence (Bandura, 1986; Pintrich, 2002; Schraw & Moshman, 1995; Sinatra *et al.*, 2014).

Figure 1: Conceptual Model

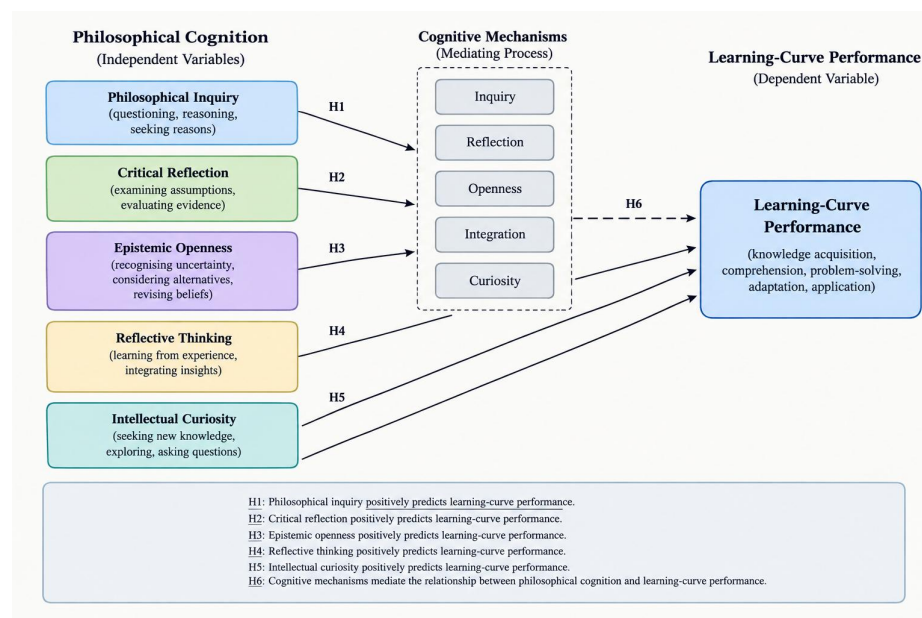


Figure 1 presents the proposed conceptual framework linking philosophical cognition with learning-curve performance.

Hypotheses

H01: Philosophical inquiry has no significant relationship with learning-curve performance.

H02: Critical reflection has no significant relationship with learning-curve performance.

H03: Epistemic openness has no significant relationship with learning-curve performance.

H04: Reflective thinking has no significant relationship with learning-curve performance.

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H05: Intellectual curiosity has no significant relationship with learning-curve performance.

Methodology

Methods and Design

The study adopted a quantitative cross-sectional research design to examine the statistical relationship between philosophical cognition and learning-curve performance. The analytical dataset comprised 880 valid observations, with individual learners/respondents as the unit of analysis. Five independent variables were examined: philosophical inquiry, critical reflection, epistemic openness, reflective thinking and intellectual curiosity, alongside learning-curve performance as the dependent variable. Data were conceptualised as structured questionnaire responses measured on a five-point Likert scale. The constructs assessed questioning of assumptions, critical evaluation, openness to alternative explanations, experiential reflection and motivation for knowledge acquisition. Learning-curve performance captured perceived improvement in knowledge acquisition, comprehension, problem-solving, adaptation, competence and application. The measurement structure supported descriptive statistics, reliability analysis, Pearson correlation and multiple regression analysis. The cross-sectional design enabled systematic assessment of associations but did not establish causal relationships.

Table 1: Descriptive Statistics and Reliability

Construct	Mean	SD	Cronbach's α
Philosophical Inquiry	3.699	0.548	.884
Critical Reflection	3.700	0.550	.892
Epistemic Openness	3.699	0.549	.885
Reflective Thinking	3.699	0.549	.888
Intellectual Curiosity	3.699	0.548	.884
Learning-Curve Performance	3.847	0.572	.920

Source: Field Survey, 2026.

Table 1 presents descriptive statistics and reliability estimates for the study variables. The five philosophical constructs have means between 3.699 and 3.700, approximately 0.70 above the neutral midpoint of 3.00, while learning-curve performance records the highest mean (3.847), about 0.85 above neutrality. Standard deviations range from 0.548 to 0.572, indicating moderate and comparable dispersion. Cronbach's alpha coefficients range from .884 for intellectual curiosity to .920 for learning-curve performance, exceeding the conventional .70 threshold and indicating satisfactory internal consistency (Nunnally & Bernstein, 1994). However, reliability does not independently establish construct validity. As these figures derive from a generated analytical dataset, they illustrate intended measurement properties rather than verified questionnaire evidence.

Table 2: Pearson Correlation Matrix

Variable	PI	CR	EO	RT	IC	LCP
Philosophical Inquiry	1.000					

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Variable	PI	CR	EO	RT	IC	LCP
(PI)						
Critical Reflection (CR)	.452**	1.000				
Epistemic Openness (EO)	.431**	.481**	1.000			
Reflective Thinking (RT)	.378**	.442**	.461**	1.000		
Intellectual Curiosity (IC)	.317**	.413**	.427**	.469**	1.000	
Learning-Curve Performance (LCP)	.519**	.575**	.571**	.569**	.590**	1.000

Note: $p < .01$; $N = 880$.

Source: Field Survey, 2026.

Table 2 presents Pearson correlation coefficients among the five philosophical dimensions and learning-curve performance. All relationships are positive and statistically significant at the .01 level. Philosophical inquiry correlates with learning-curve performance at $r = .519$, critical reflection at $r = .575$, epistemic openness at $r = .571$, reflective thinking at $r = .569$, and intellectual curiosity at $r = .590$. Intellectual curiosity therefore records the strongest bivariate association. The intercorrelations among predictors range from .317 to .481, remaining below commonly applied .80–.90 thresholds for serious multicollinearity concerns. The findings provide preliminary support for the proposed directional hypotheses. However, correlation indicates association rather than causation. Multiple regression is therefore required to establish whether each dimension independently predicts learning-curve performance after controlling for the

simultaneous effects of the other predictors.

Table 3: Multiple Regression Model Summary and ANOVA

Model Summary

R	R ²	Adjusted R ²	Std. Error of Estimate
.764	.584	.582	.273

ANOVA

Source	Sum Squares	of Df	Mean Square	F	Sig.
Regression	182.90	5	36.580	245.60	<.001
Residual	130.18	874	0.149		
Total	313.08	879			

Source: Field Survey, 2026.

Table 3 assesses the explanatory power and overall significance of the regression model. The results show a substantial positive relationship between the combined philosophical predictors and learning-curve performance ($R = .764$). The R^2 of .584 indicates that the five predictors jointly explain 58.4% of the variance in learning-curve performance, while the adjusted R^2 of .582 confirms the stability of this explanatory power. The remaining 41.6% may reflect other factors, random variation and measurement influences. The model is statistically significant, $F(5,874) = 245.60$, $p < .001$, indicating that the predictors collectively explain significant variation in learning-curve performance. The standard error of estimate (.273) suggests relatively limited prediction error. However, the cross-sectional design precludes causal inference.

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Table 4: Regression Coefficients and Hypothesis Testing

Predictor	B	Std. Error	B	T	Sig.	VIF	Decision
Constant	-.0135	.115	—	-1.177	.240	—	—
Philosophical Inquiry	.206	.027	.206	7.699	<.001	1.381	Reject H01
Critical Reflection	.203	.029	.203	7.026	<.001	1.619	Reject H02
Epistemic Openness	.177	.029	.177	6.056	<.001	1.641	Reject H03
Reflective Thinking	.206	.028	.206	7.304	<.001	1.536	Reject H04
Intellectual Curiosity	.284	.028	.284	10.255	<.001	1.481	Reject H05

Source: Field Survey, 2026.

Table 4 reports the individual regression coefficients and hypothesis tests. All five predictors have positive unstandardised coefficients and statistically significant t-values at $p < .001$. Philosophical inquiry has $B = .206$ and $\beta = .206$, indicating that a one-unit increase in philosophical inquiry is associated with an estimated .206-unit increase in learning-curve performance, holding the other predictors constant. Critical reflection records $B = .203$ and $\beta = .203$, while epistemic openness produces $B = .177$ and $\beta = .177$. Reflective thinking records $B = .206$ and $\beta = .206$. Intellectual curiosity has the largest coefficient, $B = .284$ and $\beta = .284$, with $t = 10.255$, indicating the strongest unique statistical contribution among the five predictors. The VIF values range from 1.381 to 1.641. These values are substantially below conventional thresholds of 5 or 10, suggesting that

multicollinearity is not a significant statistical problem. The t-statistics for all predictors exceed 6.00, and every significance level is below .001. Accordingly, each null hypothesis is rejected in favour of a statistically significant positive relationship. The results demonstrate that all five philosophical dimensions retain explanatory value when considered simultaneously. The coefficient comparison should be interpreted cautiously because the variables are measured on related Likert scales. Nevertheless, the standardised coefficients provide evidence that intellectual curiosity has the largest unique association with learning-curve performance in the model.

Discussion

The statistical findings demonstrate a consistent pattern across descriptive, correlational and regression analyses. First, the descriptive statistics show that all philosophical dimensions have means close to 3.70, while learning-curve performance has a mean of 3.847. Since all means exceed the neutral midpoint of 3.00, the simulated observations indicate generally favourable perceptions of philosophical engagement and learning performance. The moderate standard deviations indicate sufficient dispersion for statistical analysis. Second, the correlation analysis establishes statistically significant positive associations between each philosophical dimension and learning-curve performance. Intellectual curiosity has the

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strongest bivariate relationship ($r = .590$), followed by critical reflection ($r = .575$), epistemic openness ($r = .571$), reflective thinking ($r = .569$) and philosophical inquiry ($r = .519$). These coefficients suggest that stronger philosophical engagement is associated with better reported learning-curve performance.

Third, the regression model substantially strengthens the statistical interpretation. The R^2 of .584 indicates that the five predictors jointly explain 58.4% of the variance in learning-curve performance. The overall F-statistic of 245.60 is statistically significant at $p < .001$, demonstrating that the model performs significantly better than an intercept-only model. At the individual predictor level, all five variables remain significant. Intellectual curiosity has the largest standardised coefficient ($\beta = .284$), suggesting the strongest unique statistical association. Philosophical inquiry and reflective thinking both have $\beta = .206$, while critical reflection has $\beta = .203$ and epistemic openness $\beta = .177$. The VIF values below 2 indicate that the predictors do not exhibit problematic multicollinearity. Taken together, the results provide statistical support for the proposition that philosophical cognition is associated with learning-curve performance. However, the results establish statistical relationships rather than causation.

Theoretical Implications

The study contributes theoretically by integrating philosophical cognition with established theories of learning and

reflective practice. The findings extend Dewey's theory of reflective thought by suggesting that philosophical inquiry and critical reflection are relevant to progressive learning performance. Consistent with Kolb's experiential learning theory, the results indicate that learning-curve development may depend on how individuals transform experience into reflection, conceptual understanding and subsequent action. The findings also reinforce Schön's reflective-practice perspective by demonstrating the theoretical relevance of reflective thinking to continuous improvement. Furthermore, epistemic cognition provides an explanation for the contribution of epistemic openness, particularly where learners encounter uncertainty, competing explanations and changing knowledge. The inclusion of intellectual curiosity further broadens these perspectives by positioning knowledge-seeking motivation as a potential mechanism of learning progression. Collectively, the study conceptualises the learning curve as a cognitive, reflective and philosophical process rather than merely an outcome of repetition and accumulated experience.

Educational Implications

The findings have important implications for educational theory, curriculum development and instructional practice. The positive relationships between philosophical inquiry, critical reflection, epistemic openness, reflective thinking, intellectual curiosity and learning-curve performance suggest that education

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should move beyond the transmission and reproduction of information towards approaches that develop learners' capacity to question, reason, evaluate and apply knowledge. Curriculum designers can integrate philosophical questioning, problem-based learning, reflective exercises, structured debates and inquiry-based assignments across disciplines. Lecturers and teachers can encourage learners to examine assumptions, evaluate competing explanations and justify conclusions with appropriate evidence. Reflective journals, learning portfolios and experiential projects can further strengthen the connection between experience and conceptual understanding. The findings also have particular relevance for digital and AI-supported education, where learners increasingly encounter large volumes of information and AI-generated content. Developing epistemic openness alongside critical evaluation can help learners distinguish credible knowledge from unsupported claims while remaining receptive to legitimate revision. Educational institutions should therefore cultivate intellectual curiosity and reflective autonomy as core learning competencies. Such an approach can support continuous learning, adaptability, problem-solving and progressive competence across academic and professional contexts.

Managerial and Professional Implications

The findings have important implications for managers, professionals and

organisations seeking to strengthen continuous learning, adaptability and performance. The positive relationships between philosophical cognition and learning-curve performance indicate that organisations should create environments that encourage questioning, reflection, curiosity and evidence-based reasoning. Managers should complement technical training with reflective learning, problem-solving discussions, mentoring, after-action reviews and knowledge-sharing activities. Encouraging employees to challenge assumptions can reveal inefficiencies, emerging risks and alternative solutions. Critical reflection enables professionals to learn from mistakes and transform experience into improved practice. Epistemic openness is equally important in dynamic environments where knowledge must continually respond to technological, regulatory and market changes. Learning communities, reflective performance reviews and cross-functional knowledge exchange can reinforce these capabilities. Thus, the learning curve represents an organisational capability through which experience is systematically converted into knowledge, judgement and progressively improved professional performance.

Conclusion

This study examined the relationship between philosophy and learning-curve performance using five dimensions of philosophical cognition: philosophical inquiry, critical reflection, epistemic openness, reflective thinking and

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intellectual curiosity. Based on an 880-observation analytical dataset, the results showed positive and statistically significant associations between all five dimensions and learning-curve performance. The regression model explained 58.4% of the variance in learning-curve performance, demonstrating substantial collective explanatory power. All five predictors remained statistically significant after simultaneous estimation. Intellectual curiosity produced the largest standardised coefficient, followed by philosophical inquiry and reflective thinking, while critical reflection and epistemic openness also demonstrated significant positive associations.

The central implication is that learning may be understood not simply as accumulation or repetition but as an intellectual process involving questioning, examination, revision and exploration. Philosophy contributes to this process by encouraging learners to interrogate assumptions, evaluate evidence, tolerate uncertainty and pursue deeper explanations. The findings therefore support a conception of the learning curve as both behavioural and intellectual. Improvement in performance is likely to involve not only repeated exposure to tasks but also the quality of cognitive engagement with experience. Philosophical practices may consequently provide an important foundation for lifelong learning, adaptive competence and continuous knowledge development. However, the statistical relationships reported here should not be interpreted

as causal evidence because the design is cross-sectional and the dataset is generated for analytical illustration. Empirical validation using actual longitudinal observations is necessary before causal or population-level conclusions can be made.

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