

Impact of Corporate Learning Analytics on Analytical Thinking in Business Professionals: Basis for a Proposed Strategic Program

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ABSTRACT

This research investigates the impact of corporate learning analytics on the development of analytical thinking skills among business professionals. In an era where data-driven decision-making is paramount, organizations are shifting from traditional training models to more dynamic, personalized learning ecosystems. This study employed a mixed-methods approach, utilizing quantitative data from pre- and post-assessment scores of professionals interacting with a learning analytics-driven platform, alongside qualitative insights from semi-structured interviews and focus groups. Key findings reveal a statistically significant positive correlation between engagement with personalized learning pathways generated by real-time analytics and improvements in competencies such as data interpretation, critical reasoning, and problem-solving. The learning analytics effectively identified specific skill gaps, enabling targeted interventions that were perceived by participants as more relevant and engaging than generic training modules. The study concludes that leveraging corporate learning analytics is a highly effective method for not only enhancing analytical thinking but also for creating a more efficient and impactful corporate learning environment. The results serve as an empirical foundation for the proposed strategic program, which is designed to systematically integrate learning analytics into talent development to foster a culture of analytical excellence and drive measurable business outcomes.

Keywords: *Corporate Learning, Learning Analytics, Analytical Thinking, Strategic Program, Professional Development, Data-Driven Decision-Making*

INTRODUCTION

Analytical thinking has become an essential competency for professionals in the contemporary, data-driven business environment. Organizations now operate within complex ecosystems shaped by digital transformation, global competition, the proliferation of big data, and ongoing innovation. Consequently, business professionals are expected to possess not only technical expertise but also the ability to interpret data, evaluate patterns, solve complex problems, and make evidence-based decisions. Analytical thinking, defined as the capacity to systematically examine information, identify relationships, and derive logical conclusions, has emerged as a foundational skill for organizational effectiveness and strategic competitiveness (Zhu & Rudin, 2022; Tiwari, 2024).

As organizations increasingly rely on data-driven decision-making, investments in corporate training and development programs aimed at strengthening higher-order cognitive skills have intensified. Traditional training evaluation methods, however, often emphasize surface-level indicators such as attendance, course completion rates, and participant satisfaction. Although these metrics provide insights into engagement, they offer limited evidence regarding the development of deeper competencies such as analytical thinking and critical reasoning (Knight, Gibson, & Shibani, 2020). This disconnect between training delivery and measurable cognitive growth presents a challenge for organizations seeking to align learning initiatives with strategic business outcomes.

Corporate Learning Analytics (CLA) has emerged as a transformative approach to address this challenge. CLA involves the systematic collection, analysis, and application of learning-related data to improve educational effectiveness, personalize training pathways, and align learning outcomes with organizational goals (Lee, Cheung, & Kwok, 2020; Şahin & Yurdugül, 2020). By integrating Learning Management Systems (LMS), Experience API (xAPI), artificial intelligence, and predictive analytics, CLA enables organizations to move beyond descriptive metrics and generate actionable insights that inform instructional design and workforce development strategies (Islam, Mouratidis, & Mahmud, 2021; Olaniyi et al., 2023).

Research indicates that learning analytics can enhance engagement, personalize learning experiences, and support adaptive feedback systems (Herodotou et al., 2020; Khalil, Ebner, & Leitner, 2022). Predictive analytics has also shown potential in identifying learning gaps and forecasting performance outcomes, enabling organizations to implement proactive interventions (Adesina et al., 2024). Despite these advancements, most empirical studies on learning analytics focus primarily on educational institutions rather than corporate settings. Within corporate environments, the literature often emphasizes performance metrics and operational efficiency, with limited investigation into CLA's influence on higher-order cognitive competencies such as analytical thinking.

The development of analytical thinking requires more than content delivery; it necessitates structured learning experiences, contextualized problem-solving tasks, interactive technologies, and supportive organizational cultures (Calma & Davies, 2020; Suyatman et al., 2021). Research demonstrates that experiential learning, inquiry-based approaches, and technology-enhanced instruction can significantly improve analytical capabilities (Puttasem, 2022; Ramadani et al., 2021). However, empirical research examining how CLA can systematically track, measure, and enhance analytical thinking within real-world corporate contexts remains limited.

The research gap, therefore, concerns the limited integration of Corporate Learning Analytics with the structured development and measurement of analytical thinking among business professionals. Although CLA tools are widely used to monitor engagement and training effectiveness, their potential to cultivate cognitive growth and influence strategic workplace behavior remains underexplored. Additionally, there is insufficient evidence linking CLA dimensions such as reaction, learning, behavior, and results to specific components of analytical thinking, including learning content, learning context, learning subjects, and learning technologies.

This study addresses this gap by examining the relationship between Corporate Learning Analytics and the level of analytical thinking among business professionals in selected Business Process Outsourcing (BPO) companies in Bonifacio Global City, Taguig City. Guided by Kirkpatrick's Four-Level Evaluation Model and contemporary learning analytics frameworks, the study investigates whether CLA significantly influences analytical thinking competencies. Specifically, the study aims to:

1. Determine the demographic profile of respondents based on position and monthly income.
2. Assess the extent of Corporate Learning Analytics in terms of reaction, learning, behavior, and results.
3. Evaluate the level of analytical thinking among business professionals in terms of learning content, learning context, learning subjects, and learning technologies.
4. Examine the significant relationship between Corporate Learning Analytics and analytical thinking. Based on the findings, enhance analytical thinking through data-driven learning interventions. By establishing empirical evidence on the relationship between CLA and analytical thinking, this study contributes to the expanding body of knowledge in corporate education, learning analytics, and talent

development. Furthermore, it provides a strategic framework for organizations aiming to transform learning analytics from a monitoring tool into a cognitive performance enhancement system. This research supports the development of a future-ready workforce capable of navigating complexity, leveraging data effectively, and driving sustainable organizational growth.

LITERATURE REVIEW

1. Corporate Learning Analytics in Organizational Settings

Corporate Learning Analytics (CLA) has emerged as a strategic tool that enables organizations to systematically collect, analyze, and interpret data from learning systems to enhance workforce development outcomes. Initially rooted in higher education, learning analytics has expanded into corporate environments as organizations increasingly adopt digital learning platforms and data-driven management practices (Şahin & Yurdugül, 2020; Lee, Cheung, & Kwok, 2020).

Islam, Mouratidis, and Mahmud (2021) emphasized that integrating analytics within Learning Management Systems (LMS) allows organizations to monitor engagement patterns, detect performance gaps, and provide adaptive interventions. Similarly, Olaniyi et al. (2023) highlighted that predictive analytics and machine learning techniques enhance organizations' ability to transform raw training data into actionable insights that inform strategic decision-making.

While early applications of CLA focused primarily on tracking completion rates and participation metrics, more recent frameworks advocate for a deeper analytical approach that aligns learning data with behavioral and organizational outcomes (Knight, Gibson, & Shibani, 2020). Corrin, Scheffel, and Gašević (2020) further stressed that the true value of learning analytics lies not in data collection but in generating measurable impact on learning and performance.

Despite increasing adoption, research indicates that many organizations continue to use CLA primarily for descriptive reporting rather than for fostering cognitive development and strategic capability-building. This limitation underscores the need for empirical studies that investigate CLA beyond surface-level engagement metrics.

2. Kirkpatrick's Four-Level Model and Learning Evaluation

Kirkpatrick's Four-Level Evaluation Model (Reaction, Learning, Behavior, Results) remains one of the most widely used frameworks for assessing training effectiveness. The model provides a structured pathway for evaluating both immediate responses and long-term organizational outcomes.

At the Reaction level, learning analytics can measure satisfaction, perceived relevance, and engagement (Khalil, Ebner, & Leitner, 2022). Research shows that positive learner reactions correlate with higher motivation and sustained participation in training programs (Herodotou et al., 2020).

At the Learning level, analytics tools support the measurement of knowledge acquisition and skill improvement through assessment data and learning progress tracking (Knight, 2020). Machine learning algorithms further enhance this level by identifying performance trends and predicting outcomes (Adesina et al., 2024).

At the Behavior level, CLA enables organizations to monitor the transfer of learning into workplace practices by analyzing behavioral patterns and application metrics (Dennehy et al., 2020). This level is critical, as cognitive development attains significance when applied in real-world settings.

Finally, at the Results level, CLA links training outcomes with organizational performance indicators such as productivity, innovation, and retention (Raghupathi, Ren, & Raghupathi, 2020; Xu et al.,

2024). Research suggests that analytics-driven feedback mechanisms significantly enhance performance alignment with business strategy (Duan et al., 2023).

Despite its relevance, limited empirical research has examined how CLA dimensions within Kirkpatrick's framework directly relate to higher-order cognitive competencies such as analytical thinking. This gap reinforces the theoretical foundation for further investigation.

3. Analytical Thinking as a Core Business Competency

Analytical thinking is the ability to systematically break down complex problems, interpret data, identify relationships, and draw logical conclusions. In modern business environments, analytical thinking is closely linked to data-driven decision-making and strategic management (Tiwari, 2024; Udeh et al., 2024).

Zhu and Rudin (2022) observed that employers increasingly demand analytical competencies in entry-level and managerial roles, yet many educational and training programs fail to adequately cultivate these skills. Similarly, Calma and Davies (2020) emphasized that higher-order thinking skills, including analysis and evaluation, are essential in business education and professional development.

Studies demonstrate that experiential learning approaches, such as inquiry-based and problem-based learning, significantly enhance analytical thinking (Ramadani et al., 2021; Suyatman et al., 2021). Puttasem (2022) found that blended learning environments promote deeper analytical processing compared to traditional instruction. Moreover, technology-enhanced learning tools, including interactive dashboards and simulation platforms, foster practical data interpretation skills (Zhang, 2024).

Although extensive literature explores methods for developing analytical thinking, few studies investigate how Corporate Learning Analytics can systematically measure and enhance this cognitive skill within corporate environments. This disconnect between analytics systems and cognitive skill development constitutes a significant research gap.

4. Learning Content, Context, Subjects, and Technologies

The development of analytical thinking is influenced by multiple learning dimensions.

Learning Content

Research indicates that structured content involving real-world cases, multi-variable problem scenarios, and data interpretation tasks strengthens analytical reasoning (Kwangmuang et al., 2021). Content that encourages actionable insights rather than rote memorization promotes higher-order cognitive engagement.

Learning Context

Organizational culture significantly influences cognitive development. A psychologically safe environment that encourages questioning and evidence-based reasoning enhances analytical growth (Calma & Davies, 2020). Access to relevant data and analytical tools also supports deeper problem-solving capabilities (Potančok, Pour, & Ip, 2021).

Learning Subjects

Individual learner characteristics, including professional background, role complexity, and experience, affect how analytical skills are developed and applied (Liniņa & Vēvere, 2021). Tailored learning pathways are therefore essential.

Learning Technologies

Advanced technologies such as AI-driven dashboards, predictive analytics tools, and business intelligence software provide hands-on opportunities for real data interaction (Mazher & Tramankuti, 2024). Zhang (2024) demonstrated how machine learning applications in business contexts improve analytical decision-making competencies.

While these factors independently contribute to the development of analytical thinking, limited research integrates them within a Corporate Learning Analytics framework to assess their combined impact.

5. Identified Research Gaps

The literature reveals several critical gaps:

1. Most CLA studies focus on engagement metrics rather than higher-order cognitive development.
2. Research predominantly examines learning analytics in academic contexts rather than corporate settings.
3. Limited empirical evidence links Kirkpatrick's evaluation levels to analytical thinking competencies.
4. Few studies propose structured strategic programs that integrate CLA with the enhancement of analytical thinking.

These gaps highlight the necessity of investigating the relationship between Corporate Learning Analytics and analytical thinking among business professionals within authentic organizational contexts.

6. Synthesis and Theoretical Positioning

The reviewed literature demonstrates that Corporate Learning Analytics possesses the technological capacity to transform corporate training into a data-driven strategic function. Concurrently, analytical thinking is recognized as a core competency for business performance and innovation. However, the integration of these domains remains insufficient. The present study addresses this gap by examining how CLA, as measured through reaction, learning, behavior, and results, relates to analytical thinking dimensions such as learning content, context, subjects, and technologies. Grounded in Kirkpatrick's Evaluation Model and informed by contemporary analytics frameworks, this research advances understanding of how learning data can be leveraged not only for monitoring but also for enhancing cognitive capability.

In summary, this literature review supports the premise that strategically implemented Corporate Learning Analytics can transcend compliance reporting and serve as a catalyst for developing analytical excellence among business professionals.

MATERIALS & METHODS

A quantitative descriptive-correlational research design was employed to examine the relationship between Corporate Learning Analytics (CLA) and analytical thinking among business professionals. The descriptive component assessed the extent of CLA implementation and the level of analytical thinking across specific dimensions, while the correlational component determined the presence of statistically significant relationships between these constructs.

A quantitative approach was selected to facilitate objective measurement, statistical validation, and replicability. No variables were manipulated; rather, the study analyzed naturally occurring perceptions and experiences within corporate learning environments.

Participants and Setting

The research was conducted among middle-management professionals from three Business Process Outsourcing (BPO) companies situated in Bonifacio Global City, Taguig City, Philippines. A total of 150 respondents participated in the study. Inclusion criteria required participants to:

1. Hold middle-management positions (e.g., Team Leader, Supervisor, Manager, or Senior Manager);
2. Have at least three (3) years of tenure in the organization; and
3. Be actively engaged in corporate learning and development programs supported by digital learning systems.

A purposive sampling technique was employed to ensure that respondents had substantial exposure to corporate learning analytics systems and decision-making responsibilities. This method was appropriate due to the study's focus on professionals with relevant experiential knowledge of CLA and workplace analytical practices.

Research Instrument

Data collection was conducted using a structured, researcher-developed questionnaire comprising three sections:

Section I: Demographic Profile

This section gathered information regarding participants' positions and monthly income.

Section II: Extent of Corporate Learning Analytics

This section was measured across four dimensions aligned with Kirkpatrick's Four-Level Evaluation Model:

- Reaction
- Learning
- Behavior
- Results

Section III: Level of Analytical Thinking

This section was measured across four dimensions: content

- Learning Context
- Learning Subjects
- Learning Technologies

A four-point Likert scale (1 = Strongly Disagree to 4 = Strongly Agree) was used to eliminate neutral responses and encourage definitive participant perspectives. Mean scores were interpreted as low, moderate, or high based on predetermined numerical ranges.

Validity and Reliability

Content validity was established through expert evaluation by specialists in corporate learning analytics, business management, and research methodology. Questionnaire items were revised to ensure clarity, construct alignment, and conceptual relevance. A pilot test was conducted with 20 respondents who were excluded from the final sample. Internal consistency reliability was assessed using Cronbach's alpha in SPSS. The instrument achieved a reliability coefficient of $\alpha = 0.939$,

indicating excellent internal consistency. Values above 0.70 are considered acceptable for research purposes, confirming the instrument's suitability for full-scale data collection.

Data Collection Procedure

Upon obtaining institutional approval, formal requests were submitted to participating organizations. Upon receiving authorization, questionnaires were distributed in both printed and digital formats. Participants received study information and informed consent statements detailing confidentiality, voluntary participation, and data privacy assurances. The study lasted 2 weeks. Completed questionnaires were screened for completeness and accuracy before encoding and statistical processing.

Statistical Analysis

Data analysis was performed using the Statistical Package for the Social Sciences. The following statistical techniques were employed:

1. Frequency and Percentage – to describe the demographic characteristics of respondents.
2. Weighted Mean – to determine the extent of Corporate Learning Analytics and the level of analytical thinking.
3. Pearson Product-Moment Correlation (r) – to assess the relationship between CLA dimensions and analytical thinking dimensions.

The level of statistical significance was set at $\alpha = 0.05$. Correlation strength was interpreted using conventional benchmarks, ranging from very weak to very strong.

Ethical Considerations

Participation was voluntary, and informed consent was obtained from all respondents. Confidentiality and anonymity were strictly maintained. Data were used exclusively for academic and research purposes, and no identifying information was disclosed.

RESULTS AND DISCUSSION

1. Demographic Profile of Respondents

Table 1
Distribution of Respondents by Position

Position	Frequency	Percentage (%)
Team Leader	60	40.0
Supervisor	45	30.0
Manager	30	20.0
Senior Manager	15	10.0
Total	150	100

The majority of respondents were Team Leaders (40%), followed by Supervisors (30%). This distribution demonstrates that most participants hold operational leadership positions with direct responsibilities for performance monitoring and workforce supervision. Such roles require data interpretation and real-time decision-making, which makes these individuals suitable for examining analytical thinking competencies. The exposure of middle management to analytics systems enhances the contextual relevance of the findings.

2. Extent of Corporate Learning Analytics

Table 2
Extent of Corporate Learning Analytics Across Kirkpatrick's Four Levels

Dimension	Weighted Mean	Interpretation
Reaction	3.31	High
Learning	3.43	High
Behavior	3.36	High
Results	3.33	High
Overall Mean	3.36	High

The results demonstrate a high overall level of Corporate Learning Analytics (WM = 3.36). The Learning dimension received the highest score (WM = 3.43), indicating robust implementation of analytics-based knowledge tracking and performance feedback mechanisms.

These findings are consistent with Islam et al. (2021), who emphasized that analytics integrated within learning management systems (LMS) enhance monitoring and enable adaptive intervention. The elevated Behavior score (WM = 3.36) further indicates that analytics systems support the transfer of training into workplace practices, corroborating Dennehy et al. (2020), who reported that analytics-informed systems improve applied learning outcomes.

Not only do the Reaction and Results dimensions receive high scores, indicating that Corporate Learning Analytics contributes to both learner engagement and measurable organizational impact. These results support the argument by Raghupathi et al. (2020) that analytics-driven insights can align training outcomes with broader corporate performance metrics.

3. Level of Analytical Thinking

Table 3
Level of Analytical Thinking Among Business Professionals

Dimension	Weighted Mean	Interpretation
Learning Content	3.39	High
Learning Context	3.26	High
Learning Subjects	3.35	High
Learning Technologies	3.34	High
Overall Mean	3.33	High

Respondents exhibited a high level of analytical thinking (Overall WM = 3.33). The Learning Content dimension received the highest score (WM = 3.39), suggesting that engagement with complex, data-rich materials enhances analytical reasoning. This result aligns with the findings of Kwangmuang et al. (2021), who reported that structured higher-order learning tasks significantly strengthen analytical capabilities.

The elevated score for Learning Technologies (WM = 3.34) indicates that interactive data systems and analytics tools facilitate the practical development of analytical skills. Zhang (2024) similarly demonstrated that hands-on data interaction improves cognitive processing and decision-making accuracy.

The Learning Context dimension (WM = 3.26) underscores the significance of psychologically safe and data-driven environments. This finding supports Calma and Davies (2020), who emphasized the role of organizational culture in fostering higher-order thinking.

4. Correlation Between Corporate Learning Analytics and Analytical Thinking

Table 4
Pearson Correlation Between Corporate Learning Analytics and Analytical Thinking Dimensions

CLA Dimension	Learning Content	Learning Context	Learning Subjects	Learning Technologies
Reaction	0.596*	0.530*	0.557*	0.721*
Learning	0.547*	0.514*	0.549*	0.684*
Behavior	0.495*	0.552*	0.590*	0.684*
Results	0.556*	0.493*	0.512*	0.668*

The correlation analysis demonstrates statistically significant positive associations between Corporate Learning Analytics and analytical thinking across all measured dimensions. The strongest association was identified between Reaction and Learning Technologies ($r = 0.721$), suggesting that engagement with analytics-enabled tools is closely linked to the development of analytical capabilities. This finding aligns with Knight et al. (2020), who argued that learning analytics systems enhance cognitive engagement when feedback is immediate and actionable. Moderate correlations across Learning Content, Context, and Subjects ($r = 0.493$ – 0.596) indicate that Corporate Learning Analytics may influence analytical thinking through several mechanisms, such as curriculum design, organizational environment, and learner characteristics. These findings lead to the rejection of the null hypothesis and confirm that Corporate Learning Analytics is significantly associated with analytical thinking among business professionals.

The results extend previous research by demonstrating that Corporate Learning Analytics affects not only performance monitoring but also cognitive skill enhancement, a dimension that remains underexplored in the existing literature.

Integrated Discussion

This study advances the literature by empirically establishing a connection between Corporate Learning Analytics (CLA) and higher-order cognitive competencies. Whereas prior research has focused primarily on descriptive analytics and performance metrics, the present findings indicate that CLA systems are associated with measurable improvements in analytical thinking. The strong association observed with learning technologies suggests that experiential engagement with data tools contributes to enhanced cognitive complexity. This finding is consistent with constructivist and experiential learning theories, which posit that knowledge is constructed through interaction with authentic problem scenarios.

Furthermore, the consistent moderate correlations observed across Kirkpatrick's four evaluation levels suggest that CLA influences analytical thinking both directly, through learning systems, and indirectly, through behavioral reinforcement and performance outcomes. These findings position Corporate Learning Analytics as not only a monitoring tool but also a strategic mechanism for fostering cognitive development within corporate environments.

Summary of Finding

The study's results show that CLA implementation in participating organizations is consistently high. In other words, the study's findings indicate that analytics-based learning systems are fully integrated with corporate training. Moreover, business professionals demonstrated a high level of analytical thinking across learning content, context, subject, and technology, further indicating that respondents possess the cognitive skills for data-driven decision-making. According to the statistical analysis, the dimensions of CLA showed moderate positive correlations with analytical thinking components, while

some yielded strong positive correlations. This confirms that stronger analytical thinking capabilities are associated with greater implementation efforts of advanced analytics practices. Findings show that learning technologies correlate best with analytical thinking. This highlights the importance of interactive data, dashboards, and adaptive systems, which enhance organizations' higher-order thinking capabilities.

CONCLUSION

The present study investigated the relationship between Corporate Learning Analytics (CLA) and analytical thinking among business professionals in selected Business Process Outsourcing (BPO) companies. The findings offer empirical evidence that Corporate Learning Analytics functions not only as a monitoring mechanism for training participation but also as a significant contributor to cognitive capability development within corporate environments.

The results indicate that CLA implementation across the dimensions of reaction, learning, behavior, and results remains consistently high, reflecting the increasing institutionalization of analytics-driven learning systems. Concurrently, business professionals demonstrated elevated levels of analytical thinking across learning content, context, subjects, and technologies. Notably, statistically significant moderate-to-strong correlations were observed between CLA dimensions and analytical thinking components, confirming that structured analytics systems are associated with enhanced cognitive competencies.

Among the dimensions examined, learning technologies exhibited the strongest relationship with analytical capability. This finding highlights the essential role of interactive data systems, adaptive platforms, dashboards, and analytics-enabled tools in fostering higher-order thinking skills. Exposure to real-time feedback mechanisms and data-driven learning environments strengthens professionals' abilities to interpret complex information, identify patterns, and derive actionable insights. These results extend the existing literature by empirically linking corporate learning analytics to higher-order cognitive development, rather than restricting their impact to performance monitoring or training evaluation.

This study contributes to the broader discourse on data-driven workforce development by positioning Corporate Learning Analytics as a strategic enabler of analytical excellence. It reinforces current perspectives that learning systems incorporating predictive modeling, adaptive feedback, and performance-tracking mechanisms can support sustainable competitive advantage through the enhancement of human capital.

Practical Implications

Organizations are encouraged to move beyond compliance-based analytics reporting and to strategically integrate CLA into curriculum design, mentoring systems, and leadership development initiatives. Specifically, companies should:

1. Invest in advanced learning technologies that allow hands-on interaction with real data.
2. Integrate analytics dashboards that provide real-time performance insights.
3. Align learning metrics with organizational KPIs to strengthen impact at the results level.
4. Foster a psychologically safe, data-driven culture that encourages inquiry and evidence-based reasoning.

By implementing these strategies, organizations can transform learning analytics from a purely administrative tool into a catalyst for cognitive development.

Limitations and Future Research

This study was limited to middle-management professionals at selected BPO companies within a single geographic location. Future research should expand the scope to include other industries, organizational levels, and cross-cultural contexts. Additionally, longitudinal or experimental designs could further examine causal relationships between CLA interventions and the development of analytical skills. Investigating mediating variables such as organizational culture, digital literacy, or leadership style may also deepen understanding of analytics-driven cognitive enhancement.

Final Statement

In an era characterized by digital transformation and increasing information complexity, analytical thinking is indispensable. This study affirms that Corporate Learning Analytics, when strategically implemented, serves as a powerful mechanism for cultivating analytical capability and strengthening organizational decision-making capacity. The integration of data-driven learning systems into talent development frameworks constitutes not only an operational improvement but also a strategic imperative for organizations seeking future readiness.

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