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**RESEARCH ARTICLE**

**Impact Evaluation in TD&E: Limits of ROI Against Investment Alternatives**

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**ABSTRACT**

This theoretical essay examines impact evaluation in Training, Development and Education (TD&E) as support for organisational decisions. Based on established evaluation models and Mincer's human capital approach, it proposes indicators such as time to proficiency, application rate and productivity variation, which allow results to be measured over time and compared across programmes. Return on investment (ROI) is treated as a consequence of measurement quality rather than as a design in itself. The accounting treatment of training under CPC 04 (R1)/IAS 38 is examined, highlighting the asymmetry between immediate recognition as expense and benefits that extend beyond the reporting period. As a conditional proposition, selected TD&E outlays may be recognised as an intangible asset only when identifiability, control, probable future economic benefits and reliable measurement are all met; otherwise expenditure should be recognised in profit or loss. The accounting angle remains ancillary to the decision problem in work and organisational psychology, since accounting reflects evidence generated by evaluation. It concludes that the dissemination of evaluation methodologies strengthens competitiveness and legitimises investment in TD&E.

**KEYWORDS:**

*In-service Training; Program Evaluation; Return on Investment; Human Capital; Professional Development*

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**1. Introduction**

Over the past hundred years, many organisations have invested in Training, Development and Education (TD&E). This movement has been accompanied by academic research, as noted by Bell et al. (2017), who identify the first article on the subject published in the *Journal of Applied Psychology* as a milestone in the field. Studies in economics and organisational psychology show that training can raise efficiency, though results vary (Bell et al., 2017; Lucas, 1988). This historical trajectory frames the central questions addressed next: whether training raises organisational efficiency and which procedures make it more effective.

In resource-constrained settings, TD&E decisions often rely on marginal reasoning: spending is expanded only while incremental benefits exceed incremental costs and outperform the next-best use of funds. This logic supports prioritisation, producing a shortlist of interventions with the highest expected returns based on programme costs and post-training outcomes, under explicit assumptions about attribution, time horizon, and risk.

Governance asks for effectiveness to be demonstrated under the criteria in use, often by means of operational metrics, productivity measures and financial returns. The accounting function maintains complete series of cost and productivity dating back to the organisation's founding. Training evidence must continue beyond the end of the course and through time. That continuity supports projection exercises. Consequently, training ROI, assessed in the same way as other expenditure and notably financial expenditure, is still limited in many organisations, even though it is pivotal in budget negotiations.

The informational deficit is often more severe in TD&E because outcome-level evaluation remains relatively scarce (Voicescu et al., 2025). In many cases, each new study—frequently tailored to a specific programme—requires fresh data collection and the construction of bespoke organisational indicators aligned with programme objectives. This makes it harder for firms to quantify the economic value of training and tends to raise evaluation costs (Ni at al., 2024).

Beyond methodological and financial difficulties in collecting and interpreting data, the field still lacks consolidated methods to measure and compare training effects across settings (Aragón-Sánchez et al., 2003). While there is broad agreement that training can be strategic, corporate investment in this area often remains modest. One reason is that returns are simultaneously tangible (e.g., productivity) and intangible (e.g., motivation, organisational climate, engagement), which makes monetisation and attribution particularly challenging.

Accounting treatment reinforces this difficulty. Training expenditure does not generate an intangible asset on the balance sheet. Under CPC 04 (R1)—aligned with IAS 38 (Intangible Assets) issued by the IASB—the entity is deemed not to control the future benefits of the knowledge acquired by employees, who may leave the firm (Comitê de Pronunciamentos Contábeis, 2010, item 15; IASB, 2025). Accordingly, TD&E costs are recognised as expenses in the period in which they occur, regardless of their purpose (productivity improvement, compliance, leadership development, and so forth).

The complexity here is less accounting-technical than managerial. Estimating TD&E returns requires performance indicators (ROI, internal NPS, productivity), yet those analyses do not affect the balance sheet; they inform performance assessment and appear, if at all, through the income statement. Since training improves workforce capability, it fails the controllability requirement of CPC 04 (R1); there is therefore no normative basis for capitalising training as an asset. The effect is recognised in results, not in assets. In microeconomic terms, this can be expressed as a marginal condition, the marginal benefit of training should be at least equal to the opportunity cost of other viable uses of the same resources. It is therefore insufficient for training expenditure to show a positive ROI, it must also be more advantageous than other available investments. This point is important because many authors publishing in the field do not grasp it. They are not familiar with investment decision-making within firms. Investment decisions involve managerial uncertainty, shareholder pressure for returns on committed funds, and competition among departments for primacy in capital allocation. For that reason, they often press for investment in the sector solely on the basis of a positive ROI.

Credible indicators are required to show whether training improves performance and to what extent it raises productivity. In many organisations, both training and productivity verification remain tied to external consultancies. Evaluation is more likely to spread when metrics are standardised and measurement is conducted within the firm. Under these conditions, the proposition advanced by Salas et al. (2012, pp. 76–79) that impact evaluation should extend over time can be verified.

Fragmentation undermines comparison. When units operate with idiosyncratic indicators and priorities, cross-area benchmarking fails, aggregation is weakened, and resource allocation becomes risk-prone. The position advanced here is that impact evaluation must be longitudinal and contextual: results are followed across periods under comparable workloads, and learning is assessed where it is applied, rather than through one-off snapshots. This stance is consistent with Salas et al. (2012, pp. 76–79), who argue that training and development produce tangible outcomes only when evaluation is routine and embedded in practice, with attention to what happens before, during and after programmes.

Corporate learning can be understood as a relatively enduring change in an employee's repertoire of behaviours, knowledge, and attitudes, derived from experience and mobilised to generate more effective results at work. It is fundamental to organisational development because it underpins innovation, adaptation to change, and continuous performance improvement.

## **2. Method**

This theoretical essay organises consolidated contributions on impact evaluation and transfer in TD&E and proposes a decision oriented framework. It does not report original data collection or analysis and it does not run experiments, quasi experiments or econometric models. The argument relies on widely cited reviews and meta analyses, complemented by conceptual syntheses and accounting standards where they are relevant to the decision problem, for example CPC 04 (R1)/IAS 38. Selection prioritises established scientific literature in evaluation, transfer and economic analysis applied to TD&E. Techniques such as difference in differences, matching and staggered roll outs are described only as a recommended repertoire for organisations that may evaluate impact empirically; they are not applied in this paper.

Where outcomes are not validly monetisable, cost effectiveness or cost consequence analysis is recommended; where cash flows are attributable with reliable measurement, ROI, NPV or IRR may be used as a consequence of measurement rather than as a universal design criterion. The essay does not estimate causal effects, does not generalise empirical results and does not discuss the implementation of specific policies. Its purpose is to propose a logical decision sequence for TD&E and to condition the accounting discussion on strict recognition criteria, keeping the accounting angle ancillary to the work and organisational psychology decision problem.

## **3. Literature Analysis and Discussion**

### **3.1 Key theoretical models of training evaluation**

Recent evaluation models extend classical frameworks by linking training outcomes to organisational and societal performance. Binmlafikh and Wahab (2025) and Dadd & Hinton (2022) highlight organisational and societal impacts, while Phillips (1997) emphasises ROI as a measure of value. In Brazil, Abbad and Nascimento (2021) update these approaches to align evaluation with current corporate needs.

In the literature, there are already standardised performance indicators that are commonly used to evaluate training. The most used include time to proficiency (how long it takes a participant to reach the expected level of performance), application rate (the extent to which the content learnt is actually applied in the workplace), productivity per employee (comparisons before and after training), an internal recommendation index (reflecting satisfaction and engagement), and an error-reduction index (the decrease in mistakes following training).

### *3.2 Costs and evaluation in TD&E*

Because these items ultimately affect expected returns, organisations commonly treat indirect expenditure as part of the programme's overall cost base. Considered as a whole, this cost treatment supports a more precise reading of how spending relates to results and allows TD&E to be weighed against options intended to improve the firm's financial position.

Against this accounting backdrop, in firm-level economic analysis it is common, for example, to calculate elasticities, sequences of average and marginal costs, and productivity indicators to support pricing and production decisions. These are conventional instruments of competitiveness. In practice, managers compare the profitability of the available options — including TD&E — often with a short-term horizon in view, and decide where to allocate resources. In the case of TD&E, however, the absence of a standardised set of indicators and of routine follow-up makes expected returns more uncertain. Ardoni et al. (2025) review tools used to evaluate learning transfer in workplace training. This helps to explain both the reluctance to invest in training programmes and the weaker competitive position of TD&E proposals relative to other investment alternatives. According to Training Industry (2025), global corporate spending on training remains high despite uncertain returns (ABTD, 2024).

Expected returns depend on the extent of transfer to the job (that is, whether what is learned is applied in routine work). Without organisational support, transfer is limited. Meta-analyses report small to moderate relationships between antecedents (individual and contextual characteristics) and transfer outcomes, and suggest that—when organisational support is lacking—effective transfer rarely exceeds roughly 30% of trained content. This empirical constraint reinforces the case for complementary interventions in the work environment and for evaluation designs that incorporate long-term measures and economic metrics (e.g., Blume et al., 2010). In short, what is learned is not always used at work.

The successful incorporation of what is learned in training depends on support from peers and managers, as well as on organisational culture. Geerts (2024a) supports this proposition by arguing that, despite annual global investments of approximately US\$60 billion in corporate training, transfer remains limited. This is because learning only yields results when employees are able to apply in practice what they have studied, in other terms learning by doing.

Evidence from a rural firm also illustrates the point: Paul et al. (2024) found that three out of four programmes achieved the desired results. This was feasible because their model measures training gains through standardised indicators, collects longitudinal data, and applies economic analysis. Phillips (1999) had already defended this nexus between training and productivity.

### *3.3 Why evaluate impact in TD&E?*

Although the TD&E literature presents continuous learning and skills development as indispensable practices for competitiveness (Michalakis & Vouglanis, 2025; Huselid, 1995), it is observed that such initiatives are still costly and not widely disseminated. In this sense, an alternative reading is proposed here, in which these practices may be understood as complementary or even competing with traditional strategies of cost reduction and process modernisation.

Firms increasingly treat training as a source of competitive advantage, as expressed by Michalakis and Vouglanis (2025, p. 8): 'Employee training is an imperative direction for the survival of a company ...'. To yield comparative advantage, training must show measurable improvements in competitiveness. Flynn (2025) shows that training and development initiatives can enhance employee performance and contribute to organisational growth. Ni et al. (2024) add that training investment upgrades human capital and fosters innovation. In the absence of empirical evidence, TD&E is treated as a cost. The lack of established standards across academic and business contexts sustains the perception of training as secondary. Its persistence is partly explained by organisations' pursuit of diversification in management instruments, consistent with the idea of not putting all one's eggs in one basket.

Measuring training effects allows organisations to set benefits against costs, optimise resource use, and reduce waste. Despite the recognised strategic role of leadership development, only a small minority of organisations regard their programmes as highly effective (Lacerenza, Reyes, & Marlow, 2017), and substantial TD&E expenditure naturally generates legitimate expectations of demonstrable returns from boards and shareholders. In practice, application at work is often constrained by design flaws and by organisational cultures resistant to change, leading to wasted time and resources. At the same time, evidence suggests that well-structured programmes can generate meaningful gains in performance, engagement, and financial returns (Geerts, 2024b).

Selective recruitment and internal training can drive profit growth through higher productivity. Training that builds firm-specific human capital tends to support profitability particularly in the pre-recession phase, whereas recruitment—by expanding general human capital—can aid post-recession recovery. In this way, effective recruitment and training practices can help firms outperform competitors before and after economic shocks. Both empirical and theoretical work supports the claim that well-designed training, reinforced by the organisational context, improves knowledge, skills, and attitudes and translates into measurable performance gains (Blume, Ford, Baldwin, & Huang, 2010; Mincer, 1974; Salas, Tannenbaum, Kraiger, & Smith-Jentsch, 2012).

### 3.4 ROI and its limits

As much of the TD&E literature does, Noe (2017), Phillips (2003), and Kirkpatrick & Kirkpatrick (2006) foreground financial metrics to demonstrate returns and, in so doing, legitimise training expenditure. In this context, the aim is to clarify the role of ROI as an evaluation metric, to outline its limitations (notably the difficulty of monetising intangible effects and the fragility of causal attribution when subjective elements are measured or external variables intrude), to show that the absence of complementary practices such as qualitative measures, comparison groups, controls and sensitivity tests undermines confidence that ROI reflects reality, and to argue that, for TD&E to be implemented, decision-makers must be persuaded that it raises profit more effectively than alternative investments or cost reduction.

The estimation of return on investment (ROI), used to calculate the gains derived from conducting training programmes, is neither a straightforward procedure nor one governed by standardised guidelines. Gruenewald and Mueller (2025) emphasise that reskilling success should be assessed beyond financial ROI. There is no single procedure. Organisations use multiple approaches to estimate training gains, so the estimates are not directly comparable. This is because training requirements stem from varying diagnoses and, consequently, specific prognoses. Given the complexity of the subject matter, there are no standardised orientations.

In the studies, ROI is represented by the following formula:

$$\text{ROI} = (\text{Benefit} - \text{Investment Cost}) / \text{Investment Cost} \times 100$$

Where:

Benefit: the monetary value of gains attributable to improved qualification of staff.

Investment Cost (IC): direct costs + development costs + salary costs + implementation costs.

It is evident from the equation above that ROI does not compare the return from training investment with that of other possible corporate actions. A robust estimation typically requires multiple tests, ongoing participant monitoring over an extended period, and comparisons across phases to assess whether impacts persist.

From a marginalist perspective, as in Friedman (1969), the decision to invest depends on comparing expected marginal costs and expected marginal returns. Where multiple alternatives exist, the agent selects the option whose expected marginal return exceeds marginal cost by the greatest margin, thereby maximising the investment's return. The intangibility of many training benefits complicates measurement. Applied to TD&E, this implies that funds will be allocated to training only if the expected marginal return per real invested exceeds both the interest rate and the marginal return on other alternatives. Put differently, opportunity cost should be understood as the return on the second-best foregone investment: by allocating resources to TD&E, the firm renounces the return it would have obtained from the next most profitable option.

In that light, when one contrasts positions such as Phillips (2003)—who attributes decision myopia to “bean counters” focused on cost cutting for failing to invest in TD&E—one sees that responsibility cannot be assigned to accountants alone. Such choices arise from systemic interactions among organisational actors. D2L & Training Industry, Inc. (2023, p. 15) stress the need to consider opportunity cost: “No training is ever truly free, think about salary hours, opportunity cost, resources and systems.” However, while the report addresses both “salary hours” (wage costs during training) and “opportunity cost” (the cost of foregone alternatives) from an organisational standpoint, its emphasis seems to fall more on the cost of labour time diverted from production than on the broader opportunity cost to the firm.

Given these limitations, any evaluation will otherwise be merely indicative and will not support strategic resource-allocation decisions. It is therefore recommended that the analysis include: (a) a period-by-period monetary estimate of training benefits; (b) a clear definition of the comparator alternative (e.g., automation, a commercial campaign, equipment acquisition) and its projected returns; (c) calculation of NPV or IRR for both scenarios; and (d) sensitivity analysis to test robustness of the conclusions. Only then is it possible to answer, in a genuinely objective manner, whether training is the most efficient use of resources or whether funds should be reallocated to an alternative with higher economic return.

In sum, approaches proposed by various authors, such as Phillips (1999), advise managers to provide executives with broader and more balanced information that demonstrates value beyond mere cost cutting, integrating qualitative measures and proxies to capture non-monetary effects that ROI alone does not reveal.

Evaluation design: data-collection points and mixed indicators

Berkley and Kaplan (2020) recognise that well-planned training enables employees to perform tasks more quickly and with fewer errors. A plausible explanation is that training improves the quality of workplace decisions. Since many competencies are acquired through experience in the role, training should provide practical opportunities that consolidate learning.

Given this requirement, it is important to gather information both on training costs and on the benefits arising from the skills that employees incorporate into their day-to-day routines. According to Phillips (2003), prioritisation should involve comparing cost to proficiency (converted into monetary terms) with the cost of alternative technological or process changes.

In this longitudinal follow-up, Kraiger and Ford (2021) argue that training objectives should shape both the programme's intended outcomes and the criteria used to evaluate it. It is through that alignment that managers can plan more suitable training and make

better-grounded decisions, thereby improving competitiveness. Carrying out the comparison also strengthens judgement and can prevent the adoption of training when modernisation would reduce losses more efficiently.

The evaluation of impact is greatly aided by organisations that set out their objectives with clarity and develop dependable indicators. Equally important is the systematic gathering of data, alongside the application of comparative approaches, whether through control groups or cost–benefit analysis, which together lay the groundwork for conclusions.

Impact evaluation combines quantitative and qualitative methods. Quantitative analysis compares matched monthly windows before and after training, using jointly defined indicators such as net sales per labour cost. Qualitative data help interpret concurrent changes in demand, pricing, workload and staffing.

Once the indicators and sources of evaluation have been defined, data collection should take place at three points: prior to the training (baseline), immediately after its completion (post-test), and during a longitudinal follow-up. This structure enables comparisons over time and allows verification of whether the programme’s statistical results corroborate the evaluation models proposed in TD&E literature, such as those of Kirkpatrick (2006), Phillips (2003), and Salas et al. (2012), which emphasise that training effectiveness must be demonstrated through measurable organisational outcomes. This procedure follows the scientific method.

**4. Synthesis of the literature**

Evidence and experience reported across the reviewed studies suggest that impact evaluation should incorporate—alongside empirical procedures—a set of operational practices that increase the usefulness of results for managers and leaders by explicitly linking indicators to programme objectives, as argued by Aragón-Sánchez et al. (2003) and Rodrigues & Blattmann (2014).

In line with the authors’ guidance, measurement should begin at the diagnostic stage, when indicators are built jointly by the relevant actors, consistent with Salas et al.’s (2012) recommendation that evaluation be planned from the outset. This step matters because deciding where to implement training, what to train, and whom to train constitutes a diagnosis that shapes indicator choice, content, and target audience—an emphasis also found in Voicescu et al. (2025) and Barbosa (2008), who underline the contextual relevance and practical utility of information for management.

Martins (2023) likewise stresses the importance of estimating training impact up to proficiency. That is, evaluation should track employee qualification from the period before the course through to a post-training point at which one can verify whether the participant has reached the expected level of performance. Moreover, assessment should consider both the frequency and the quality with which employees adopt new competencies in daily work, reflecting the incorporation of learning into routines and professional behaviours. In this sense, impact captures not only learning efficacy but also organisational usefulness—although such monitoring is costly and time-consuming.

It is difficult to isolate TD&E effects in well-defined groups when outcomes are measured only at the individual level. Most evaluation studies focus on individual indicators, for example personal application rates or time to proficiency (Blume et al., 2010). Less examined effects include collective impacts such as gains in team productivity, error reduction in integrated processes, or improvements in organisational climate (Abbad & Nascimento, 2021). This contrasts with Alliger and Janak’s (1989) hypothesis that individual results tend to aggregate and generate change at higher organisational levels, as indicated in the table cited in the text.

**Table 1**  
*Levels of Impact Evaluation in TD&E*

<b>Level</b>	<b>Focus</b>	<b>Examples of Indicators</b>	<b>Key References</b>
Individual	Personal outcomes and behaviors	Time to proficiency, application rate, personal productivity	Blume et al. (2010)
Collective/Organizational	Aggregate and systemic outcomes	Team productivity, error reduction in processes, improvements in organizational climate	Abbad & Nascimento (2021)

**Note.** *The table illustrates the distinction between micro-level (individual) and macro-level (organizational) effects, highlighting the need for combined approaches to capture comprehensive TD&E impacts.*

The study of TD&E effects is limited by the fact that, although outcomes are often measured at the individual level, the aggregate does not necessarily correspond to the sum of individual results. Blume et al. (2010) emphasise that most evaluation studies concentrate on individual indicators, such as personal application rates or time to proficiency. Collective effects, however, are less frequently examined, as Abbad and Nascimento (2021) points out, even though they are more appropriate for capturing

organisational change. Therefore, a methodological approach that combines micro-level (individual) and macro-level (organisational) assessments is recommended, in order to provide more robust and convincing evidence regarding TD&E outcomes.

The gap in TD&E evaluation is not mainly technical; it is organisational. Firms often run training without building measurement into the control system, and without tying the intervention to an operational target. What gets measured is what is easiest to collect at the end of the course, for example reactions, learning checks, and early individual outputs. What is harder is then ignored, such as changes in team performance and whether any effect holds. A filter is required because some initiatives are not designed to move organisation-wide indicators. When outcomes are not tracked, the cost and return of training cannot be established.

The relationship between lack of evaluation and low investment in training is widely discussed in the literature. Busso, Park, & Irazoque (2023) argue that, without professional evaluation, it is impossible to demonstrate training's value. Pineda (1995) adds that this gap makes it difficult to justify the very existence of these activities. Foot and Hook (1996) and Gómez-Mejía et al. (1996) warn of wasted resources on unsuitable initiatives when results are not measured. Noe and Kodwani (2023) note that many organisations avoid evaluation because it is costly and time-consuming, while OECD (2021) and ILO (2023) point to the absence of effective measurement systems as an additional obstacle.

The number of training hours is not a good indicator of course quality. Training that leads to learning and transfer depends on a small number of core design requirements. It should begin with a prior needs analysis to define the problem and the target group, since needs-based programmes align more closely with organisational demands and participant profiles. Delivery should also be spaced rather than massed: sessions distributed over time tend to outperform one-off concentrated provision because they support retention.

The literature reviewed argues that evaluation should cover formal learning and what is learnt through day-to-day work and colleagues. Measures need to pick up mentoring, routine support on the job and informal exchanges. Knowledge sharing often depends on what managers reward and what staff feel safe to pass on. Coaching can be captured as a variable and checked against performance. The time teams spend on these activities should be counted as an opportunity cost.

It should be recognised that many evaluation processes are constrained by limited resources. Studies stress that evaluation should be proportionate to the means available. Fully controlled experiments or extensive data collection are not always feasible, which does not invalidate the evaluative effort. Methodological flexibility broadens the scope of conclusions and strengthens institutional capacity to use evidence in management and development planning.

In summary, the literature reviewed suggests that impact evaluation in TD&E is consolidating as an instrument of knowledge management and of continuous improvement in training practice. By combining quantitative methods, qualitative analysis, and contextual interpretation, evaluation helps explain not only whether training produced results, but also why and under what conditions. Since training is only one among several factors shaping organisational performance, evaluative approaches must be capable of handling multiple variables and their interactions.

### **5. Normative hypothesis: recognising TD&E as an intangible asset**

The current accounting treatment of training expenditure is set out in CPC 04 (R1), which corresponds to IAS 38. CPC standards are issued by the Comitê de Pronunciamentos Contábeis for application in Brazil, whereas IAS 38 is issued by the International Accounting Standards Board (IASB), an international body headquartered in London. These standards require training to be recognised as an expense in the period's profit and loss.

The rationale for not recognising training spend as an asset lies in the firm's lack of control over the future benefits that training might generate. Put simply, the organisation cannot guarantee retention of trained staff; employees may leave at any time.

Recognising training expenditure as an asset under CPC 04 (R1) could, in principle, encourage wider corporate use of TD&E. If the standard were amended to allow such spending to be recorded as an intangible asset, the outlay would not fully reduce profit in the current period, in the same way that physical and intangible assets governed by the standard are not immediately expensed.

If CPC 04 (R1) permitted training expenditure to be recognised as an intangible asset, the immediate impact on reported results in the income statement (DRE) would be reduced, and amortisation over time would become possible, as with tangible assets. Translating this into accounting practice would require aligning the economic logic of investment with the recognition and measurement principles governing intangible assets under CPC 04 (R1)/IAS 38.

Allowing this accounting treatment would also shift incentives: firms would be more likely to invest in TD&E if those costs did not fully depress period profit. Such a policy would align with a stronger valuation of employees within organisations.

The theoretical basis for this proposal lies in the human-capital literature, which argues that investments in qualification raise productivity and economic performance (Mincer, 1974).

Recognition criteria. In line with CPC 04 (R1) and IAS 38, three cumulative conditions would be necessary:

- (i) Entity control: mechanisms must exist that ensure retention and use of TD&E benefits over a period consistent with amortisation (for example, retention agreements, contractual clauses, career pathways tied to continued employment, or other arrangements that make appropriation of benefits economically likely) (Comitê de Pronunciamentos Contábeis, 2010; IAS 38, 2025).
- (ii) Probability of future economic benefits: measurable evidence must show that the programme will generate identifiable benefits (productivity gains, error reduction, lower turnover, shorter time to proficiency) (Phillips, 1997; Salas et al., 2012).

(iii) Reliable measurement of cost and value: costs must be clearly attributable (development, implementation, participation hours, technologies) and benefits must be estimated using auditable protocols (ROI, NPV/VPL, sensitivity analysis, counterfactuals) (Phillips, 2003; Imbens & Wooldridge, 2009).

In short, recognising TD&E as an intangible asset under strict, auditable conditions is not merely an accounting novelty: it is a governance mechanism that induces better programme design, measurement, and prioritisation, aligning investment in people with a long-term value-creation logic (CPC 04 (R1)/IAS 38; Phillips, 2003).

## **6. Conclusion**

Organisations can enhance employee productivity through training, as outlined in the TD&E literature and pointed out by Borges-Andrade, Abbad and Mourão (2006), by setting expectations about what they need to achieve during study time at work. To this end, firms valuing workers' performance in both routine and creative tasks would contribute to the effectiveness of the trainings. For such an expense, under budget constraints and heightened pressure for accountability, measuring results is not optional: it is the condition for justifying investment, comparing alternatives, and aligning development programmes with organisational objectives.

In light of the broader discussion presented in this essay, it becomes evident that the absence of consolidated standards in impact evaluation reduces the use of TD&E within organisations. Although theoretical models such as those of Kirkpatrick, Hamblin and Phillips provide valuable conceptual guidance, their fragmented application across companies results in heterogeneous evidence, difficult to compare and generalise.

Overcoming these limitations requires robust protocols (baseline, post-test, and follow-up), integration of financial and operational metrics, and the use of statistical and economic methods that support counterfactual comparison.

Treating training as an investment can change how it competes for budget against machinery and equipment. When TD&E is expensed, the hit to profit is immediate: it reduces profit (or increases loss) in the period incurred. A machine is recognised as a property, plant and equipment asset, so the P&L impact is spread over time through depreciation. Tax relief may reduce the cash cost of training if legal conditions are met, but it does not change the timing difference between expensing and capitalisation.

Both tangible and intangible assets can boost productivity. If the main criterion is future economic benefits backed by real evidence, there's really no strong reason for a blanket rule that singles out training for different treatment. When a training program meets the recognition standards and its effects can be measured reliably enough to pass an audit (including clear attribution), then TD&E spending can be judged by the same investment rules used for other assets.

Ultimately, evaluating TD&E impact requires estimating benefits and costs based on scientific evidence, and the decision to adopt a programme depends on a net benefit that exceeds that of competing alternatives. To this end, the development of Needs Analysis could help. It is also necessary to set out these calculations in detail, because they are less familiar than traditional financial adjustment methods.

Future research can explore these possibilities to better understand the specific training configurations that can affect a company's productivity. However, the work aims only to propose training as an investment to enhance the workforce's value.

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