# What are the primary theories of change linking capacity development activities to improved individual-level capabilities, performance, career growth, and other related outcomes?

## Executive Summary

This literature review investigates the primary theories of change that explain how capacity development activities lead to individual-level outcomes such as improved capabilities, workplace performance, and career advancement. By synthesizing insights from nine clusters of theories - including adult learning–centered theories; social–cognitive and motivational models; non-cognitive construct interventions; learning-transfer models; behavior-change and implementation science frameworks; competency-based education and assessment; developmental relationships; training-cascade models; and practice-intensive models - the review provides a structured account of how different clusters conceptualize and operationalize the link between interventions and outcomes.

Three interdependent conditions are theorized to shape whether capacity development delivers lasting outcomes. Capability represents not only the acquisition of knowledge and skills but also the cultivation of adaptability that prepares individuals for evolving challenges. Motivation fuels persistence, with autonomy, self-belief, and goal orientation ensuring that individuals continue to apply and refine what they have learned. Opportunity transforms potential into performance, as organizational support, peer networks, and systemic incentives determine whether new competencies are actually used. It is the interaction among these conditions - rather than any single factor alone - that is posited to produce sustained improvements in performance and growth.

Interventions that focus narrowly on training content are often insufficient on their own; the transfer literature and implementation frameworks indicate that complementary motivational and contextual supports are typically needed for consistent on-the-job use. Accordingly, this review emphasizes theories that specify how capability, motivation, and opportunity can be designed and aligned - without making claims about intervention “effectiveness” per se. The overarching implication is conceptual rather than evaluative: capacity development should be treated as an interconnected process that intentionally nurtures motivational mechanisms and enabling contexts alongside skill acquisition.

## Introduction

This literature review addresses the question: *What are the primary theories of change linking capacity development activities to improved individual-level capabilities, performance, career growth, and other related outcomes?* Clarifying these causal pathways is critical, as capacity development interventions often succeed or fail depending on the underlying mechanisms through which learning, motivation, and contextual supports translate into sustained professional outcomes.

The review is structured around nine clusters of theories of change (ToCs) that together represent the dominant causal logics in the literature: adult learning–centered theories; social–cognitive and motivational models; non-cognitive construct interventions; learning-transfer models; behavior-change and implementation science frameworks; competency-based education and assessment; developmental relationships; training-cascade models; and practice-intensive models. Each cluster is examined in terms of its central causal assumptions, operative mechanisms, and enabling conditions. Following these sections, a comparative synthesis integrates cross-cutting insights, and the conclusion highlights practical implications and priorities for further research.

For the purposes of this review, “theory of change” is understood at a high level as a causal account that links capacity development activities to individual-level outcomes. Detailed definitional boundaries and criteria for inclusion are provided in the subsequent section.

By synthesizing diverse theoretical traditions into an integrated account, this review seeks to advance conceptual clarity and provide a more robust foundation for the design, evaluation, and scaling of capacity development initiatives.

## What Counts as a “Theory of Change” in Capacity Development?

Across evaluation, organizational learning, and professional education, “theory of change” denotes a reasoned account of how and why an intervention is expected to produce effects for particular people in particular contexts. Usage ranges from reflective, iterative accounts of change to evaluable causal models that make mechanisms and assumptions explicit. Given this variability, and the diversity of approaches covered in this review, we adopt an inclusive but disciplined definition: a ToC is any explicit statement or reasonably inferable causal logic that links capacity-development inputs to individual-level changes in capability, behavior, and professional trajectory, while specifying (at least in outline) the mechanisms through which change occurs and the conditions under which those mechanisms are likely to operate.

To avoid ambiguity, by “adult learning accounts” we mean established theories within the adult learning literature - specifically andragogy, experiential learning, and transformative learning - that articulate how adult learners acquire, interpret, and apply knowledge in ways that can be traced to individual outcomes. This definition deliberately spans different theoretical lineages represented in the final “Theory of Change Clusters.” Adult-learning theories qualify when they explain how relevance, reflection, and perspective transformation yield new, consistently enacted practices. Motivational models qualify when they show how need satisfaction, self-efficacy, or goals drive persistence and transfer. Implementation frameworks qualify when they diagnose how capability, opportunity, and motivation interact to generate behavior. Assessment-anchored approaches qualify when they link competency definitions and entrustment to real-world performance. Relational approaches qualify when they specify how feedback, identity work, sponsorship, and accountability translate learning into results. Practice-intensive models qualify when they show how structured repetition and error engagement build adaptive expertise. Cascade models qualify when they explain how trainer selection, resources, alignment, implementation governance, and nurturing supports convert local gains into wider diffusion.

At the same time, we apply a quality screen. Included materials must (a) articulate or allow reconstruction of a causal pathway that centers individual outcomes; (b) identify operative mechanisms (e.g., motivation, self-regulation, social reinforcement) rather than listing activities alone; and (c) provide some justification - conceptual, empirical, or experiential - for those claims. Descriptive accounts that treat capacity development as a “black box,” or system-level frameworks that omit links to individual behavior, fall outside scope.

## Theory of Change Clusters

### Adult Learning–Centered Theories of Change: Andragogy, Experiential, and Transformative Learning

This cluster of theories of change emphasizes the distinctive processes by which adults learn and how those processes link capacity development activities to enhanced capabilities, workplace performance, and career trajectories. Three complementary approaches - Andragogy, Experiential Learning Theory, and Transformative Learning Theory - have been especially influential in articulating the causal logics that explain not only what adults learn but how learning translates into durable outcomes. Each theory highlights a specific pathway: andragogy stresses the role of autonomy, prior experience, and intrinsic motivation; experiential learning emphasizes the iterative cycle of experience, reflection, abstraction, and experimentation; and transformative learning foregrounds perspective transformation triggered by disorienting dilemmas.

Adult Learning Theory, or andragogy, originally advanced by Knowles (1984), provides one of the most influential frameworks for understanding how capacity development activities translate into improved individual outcomes. Knowles argued that as adults mature, their self-concept shifts from dependence to self-direction, their accumulated experiences become critical resources for interpreting new knowledge, and their readiness to learn is increasingly shaped by social roles and immediate challenges. Adults also tend to favor problem-centered learning with clear, real-world relevance, and their motivation is driven more by internal goals than by external pressures. Building on these assumptions, Knapke et al. (2024) emphasize that adults bring prior expertise and a preference for learning that directly supports their objectives, while Livingston (2023) highlights their focus on immediate problem-solving and demand for visible relevance to personal or professional contexts.

The causal pathway begins with learning activities that respect autonomy, draw on learners’ prior experiences, and demonstrate clear relevance to their goals (Knowles, 1984; Knapke et al., 2024). These activities activate mechanisms such as heightened intrinsic motivation, stronger engagement, and deeper reflection, which in turn foster mastery and the capacity to transfer skills to workplace practice. For these mechanisms to take effect, however, enabling conditions are essential: psychological safety that allows learners to make mistakes and ask questions without fear, choice and autonomy that reinforce self-direction, and explicit links between content and real-world challenges that sustain motivation (Livingston, 2023). By specifying these mechanisms and conditions, andragogy illustrates how capacity development can plausibly lead to improvements in capability, performance, and professional growth, though such outcomes depend on the extent to which enabling factors are present.

Experiential Learning Theory (ELT), developed by Kolb (1984), defines learning as a cyclical process in which knowledge emerges through the transformation of experience. Rather than conceiving learning as the passive absorption of information, ELT views it as an active sequence of four interconnected stages: engaging in a concrete experience, reflecting on that experience, abstracting key insights into conceptual principles, and testing those principles through active experimentation. Progression through the full cycle ensures that learners both extract meaning from prior experiences and adapt their actions in response to new understanding. Scholars have emphasized the value of this model for adult learners, noting its role in fostering deeper retention, adaptability, and the integration of theory with practice (Morris, 2020; Wilkinson, 2017).

ELT posits that capacity development activities are most effective when they enable learners to move iteratively through the experience–reflection–abstraction–experimentation cycle. This process activates mechanisms of critical reflection and active application, which consolidate flexible cognitive schemas. These schemas provide the foundation for transfer, equipping learners to generalize lessons across contexts, adapt to novel challenges, and apply knowledge effectively in professional practice (Morris, 2020; Wilkinson, 2017). The outcomes are enhanced capabilities, stronger performance, and greater career resilience. For these mechanisms to operate, enabling conditions must be present: authentic tasks that mirror real-world complexity, structured opportunities for guided reflection, and channels to test ideas directly in workplace settings. When these design levers are in place, individuals become active participants in their own development, internalizing and adapting learning in ways that build not only competence but also long-term adaptability.

Transformative Learning Theory, developed by Mezirow (1978; 2018), defines adult learning as a process in which individuals fundamentally change their frames of reference through critical reflection. Unlike models that emphasize the acquisition or application of discrete skills, this theory highlights the potential for profound perspective transformation. Such change is often triggered by “disorienting dilemmas” - experiences or ideas that directly challenge existing assumptions and worldviews (Fleming, 2018; EAEA, 2022). When faced with these dilemmas, learners engage in sustained reflection and dialogue with others, which can lead them to reassess prior beliefs, reframe interpretations of experience, and even reconstruct elements of their identity. In practice, however, deliberately engineering such disorienting experiences in evaluation capacity development (ECD) initiatives may not always be feasible or appropriate. While the theory suggests that transformative shifts can occur when learners are prompted to question assumptions, interventions may more realistically focus on creating safe spaces for dialogue, reflection, and perspective-taking, thereby fostering conditions in which such transformation can emerge organically.

The pathway begins with exposure to disorienting experiences that destabilize established meaning structures. This initiates mechanisms of critical reflection and perspective transformation, enabling learners to develop new meaning schemes that support more inclusive, adaptive, and evidence-informed ways of thinking (Fleming, 2018). The outcomes are not limited to new knowledge or skills but extend to durable shifts in behavior, such as adopting patient-centered professional practices or integrating evidence more systematically into decision-making. For this pathway to unfold, enabling conditions are essential: a psychologically safe environment that fosters trust, skilled facilitation to scaffold reflection and dialogue, and structured follow-up supports that reinforce newly adopted perspectives. Absent these supports, learners may resist change or revert to prior frames of reference, weakening the intended impact of transformative learning.

Taken together, these theories provide a multi-layered account of how adult learning contributes to individual-level outcomes. Andragogy underscores the importance of aligning activities with learners’ goals and creating psychologically safe environments that support autonomy and engagement. Experiential learning explains how iterative cycles of practice and reflection consolidate flexible schemas that enable transfer and adaptability. Transformative learning extends this logic further by showing how critical reflection and dialogue can fundamentally reshape frames of reference, leading to new meaning structures and enduring behavioral change. Across all three, the causal chain runs from thoughtfully designed activities, through mechanisms such as motivation, reflection, and perspective transformation, to outcomes of improved capability, performance, and career growth. Yet each also stresses that these mechanisms are contingent on enabling conditions - relevance, authenticity, autonomy, feedback, dialogue, and supportive environments - that sustain the transformation of learning into practice. For capacity development interventions, the implication is clear: success depends not only on instructional design but also on the creation of contexts that activate and reinforce the deeper processes through which adults learn and change.

### Social–Cognitive and Motivational Theories of Change: Self-Determination, Self-Efficacy, and Goals

A second family of theories of change emphasizes the role of motivation, beliefs, and self-regulation in linking capacity development interventions to individual-level outcomes. These theories - self-determination theory, self-efficacy, and goal-setting with feedback - are grounded in social–cognitive perspectives that recognize learning as not only a process of skill acquisition but also a function of how individuals perceive themselves, their goals, and their environments. Each provides a distinct causal logic that explains how training, coaching, or educational activities can activate psychological mechanisms that strengthen persistence, transfer, and performance in professional contexts.

Self-Determination Theory (SDT) provides one of the most comprehensive frameworks for understanding adult motivation in learning and work contexts. At its core, SDT posits that human beings have three fundamental psychological needs - autonomy, competence, and relatedness - and that environments that support these needs foster more self-determined forms of motivation (Ryan et al., 2022). In the context of capacity development, interventions designed with need-supportive features - such as giving learners meaningful choices, offering optimally challenging tasks, providing constructive and informative feedback, and creating supportive relationships - facilitate the internalization of learning goals. This internalization shifts motivation from external pressures to intrinsic or integrated forms, which are more robust, sustainable, and conducive to application in the workplace (Van den Broeck et al., 2021). The theory of change here suggests a pathway in which supportive design leads to the satisfaction of psychological needs, which then enhances motivation, persistence, and ultimately performance. Meta-analytic evidence consolidates this logic, showing that SDT-based motivational processes are predictive not only of stronger learning outcomes but also of organizational behaviors such as engagement, job satisfaction, and well-being (McAnally et al., 2024). For external initiatives like ECD programs, these insights highlight both opportunities and limits: while training design can strengthen learners’ autonomy and competence, the broader organizational environment that sustains relatedness and reinforces motivation often lies outside the initiative’s direct control. This raises practical questions about whether such interventions should target individuals already embedded in supportive environments, or whether they should be deliberately paired with efforts that address organizational and systemic conditions.

Self-efficacy, derived from Bandura’s social–cognitive theory (2001), highlights the central role of individuals’ beliefs in their own capabilities to organize and execute actions. Training and development programs can influence self-efficacy by creating mastery experiences (successful performance of tasks), opportunities for vicarious learning (observing competent peers), and exposure to credible feedback that reinforces learners’ belief in their competence (Somuah et al., 2024). When self-efficacy is strengthened, individuals approach tasks with greater confidence, exert higher levels of effort, and demonstrate greater resilience in the face of setbacks (Fida et al., 2025). The mechanism linking self-efficacy to outcomes is thus straightforward but powerful: heightened self-belief translates into stronger effort and perseverance, which increase the likelihood that newly acquired skills are applied effectively on the job. Recent studies across sectors, including research conducted in African public universities, have reaffirmed that self-efficacy is a consistent predictor of both task performance and contextual performance. For capacity development initiatives, this suggests that interventions which include structured opportunities for practice and feedback can realistically help strengthen self-belief, even if broader organizational factors remain unchanged.

Goal-setting theory and feedback mechanisms further clarify how capacity development activities can be structured to facilitate behavior change and transfer. The foundational insight here is that specific, challenging goals focus attention, energize effort, and encourage persistence, while feedback mechanisms help learners monitor progress and recalibrate strategies (Locke & Latham, 2007, 2013). Clear and ambitious goals operate through several mechanisms: they direct attention to task-relevant behaviors, mobilize effort by signaling the importance of outcomes, sustain persistence in the face of obstacles, and stimulate the generation of problem-solving strategies (Locke & Latham, 2007, 2013). When such processes are embedded into training or coaching, learners develop stronger self-regulation skills, which in turn increase the likelihood that new knowledge is applied consistently in practice. Coaching interventions amplify this process by providing ongoing accountability and personalized adjustment, ensuring that goals remain salient and attainable.

The practical application of these insights can be seen in contexts where training is explicitly tied to performance management. In the South African public service, for example, training initiatives have often been criticized for producing limited results because they were not clearly aligned with employee performance targets. Munzhedzi (2017) argues that when training is conducted as a stand-alone activity, it risks being viewed as a compliance exercise rather than a developmental intervention. By contrast, when training is embedded within performance management cycles - through needs assessments, performance reviews, and appraisal-linked accountability mechanisms - it reinforces alignment between individual development and organizational priorities. This integration strengthens the causal pathway from learning to improved institutional performance by embedding skill development within systems of accountability and reward (Munzhedzi, 2017). For ECD initiatives, this illustrates that short, stand-alone trainings - such as week-long workshops - may be less likely to yield lasting effects unless they are embedded within participants’ professional pathways or accompanied by organizational supports. This raises a strategic consideration: program designers may need to be deliberate about participant selection, targeting individuals who are positioned to act on new skills, or pairing individual-level interventions with complementary organizational engagement.

The Competency-Based Cognitive Development Model (CCDM) complements these theories by explicitly linking adult learning to behavioral psychology and cognitive developmental processes. It draws on frameworks such as the Theory of Planned Behavior (TPB) and the ABC model of attitudes, both of which shed light on how learning translates into action. TPB posits that behavior is shaped by three key determinants: attitudes toward the behavior (whether learners view the new practice positively or negatively), subjective norms (perceptions of what important others expect), and perceived behavioral control (the belief that one has the ability and resources to perform the behavior). CCDM integrates this logic into its design, emphasizing that training interventions must not only build skills but also positively shape attitudes, strengthen perceptions of social support, and enhance learners’ confidence in their ability to act. Likewise, the ABC model (affect, behavior, cognition) highlights that attitudes are multidimensional: learners’ emotions, cognitive evaluations, and behavioral tendencies all contribute to whether learning is internalized and enacted. By embedding these insights, CCDM positions capacity development as a process that requires alignment of cognitive, affective, and behavioral dimensions, creating a stronger bridge between classroom learning and workplace performance (Jajoo & Deshmukh, 2024). The mechanisms at work in this model include attitude change, enhanced self-regulation, and a gradual restructuring of competencies through repeated practice and reinforcement.

These social–cognitive and motivational theories of change highlight that the success of capacity development interventions depends not only on the quality of the instructional content but also on how learners are motivated, supported, and guided through the learning process. By satisfying psychological needs (SDT), strengthening self-beliefs (self-efficacy), and structuring learning around clear goals and feedback (goal-setting theory), interventions can activate the psychological mechanisms that increase the likelihood that new knowledge is applied and sustained in the workplace. At the same time, the practical relevance for ECD initiatives lies in recognizing the boundaries of influence. While program design can shape motivation and self-efficacy in the short term, deeper traits and organizational contexts may constrain how far these mechanisms translate into practice. This suggests that such theories of change are most useful when interpreted as highlighting potential pathways rather than guaranteed outcomes, and when combined with strategic choices about whom to target, how to support transfer, and whether to link individual training to broader organizational reforms.

### Non-Cognitive Construct Interventions (NCIs) Theory of Change

Williams et al. (2022) propose a theory of change that positions non-cognitive skills - such as self-regulation, adaptability, and collaboration - as critical enablers of career readiness and long-term success. Their framework begins with a strategic selection phase, in which program designers identify target traits that are both malleable and predictive of positive outcomes. These traits must also be appropriate for the learner population and relevant to the context in which the intervention occurs (pp. 3–4).

The design phase then links each selected trait to specific, evidence-based instructional methods. For instance, self-regulation may be developed through structured goal-setting and time management exercises; collaboration can be fostered through role-playing and peer interaction; adaptability might be enhanced via scenario planning and reflective journaling. These methods are intended to activate three complementary mechanisms: psychological (e.g., increased self-awareness), cognitive (e.g., improved metacognition), and behavioural (e.g., habitual practice of new skills) (pp. 7–9).

Learning progresses through four stages: awareness of the trait and its relevance, acquisition of strategies to develop it, application of those strategies in real or simulated settings, and consolidation through sustained use. This trajectory is not assumed to be automatic. The authors emphasize the importance of regular assessment checkpoints to gauge progress and adapt delivery methods accordingly. Contextual moderators - such as the learner’s baseline skill level, cultural norms, and the mode of delivery (online vs. in-person) - are recognized as influential factors that shape learning outcomes (pp. 8–10).

Importantly, the theory highlights that trait development does not translate into career readiness unless learners are given opportunities to apply and reinforce these skills over time. Without extended practice and environmental reinforcement (e.g., feedback from supervisors, peer recognition), initial gains may erode before they affect outcomes like job persistence, promotion, or satisfaction (pp. 12–14).

This framework is particularly relevant to capacity development interventions that aim to move beyond technical proficiency and cultivate the broader behavioural competencies necessary for career advancement. It suggests that interventions should deliberately integrate mechanisms that support trait internalization, behavioural rehearsal, and real-world application if they are to achieve lasting effects.

### Learning Transfer Theories of Change: From Learning to On-the-Job Use (and Results)

One of the most influential frameworks for understanding how capacity development translates into individual performance is the learning transfer model advanced by Baldwin and Ford (1988). Their model conceptualizes transfer as a function of three interrelated factors: trainee characteristics, training design, and the work environment. Together, these factors shape not only whether learners acquire knowledge and skills during training but also whether they subsequently generalize and maintain those skills in workplace contexts. The central proposition is that the value of training lies not in the learning event itself but in the degree to which acquired competencies are applied and sustained on the job.

At the level of training design, Baldwin and Ford (1988) emphasized that well-structured practice opportunities, effective modeling, and training approaches that allow for error tolerance are critical to fostering robust learning. More recent syntheses confirm that instructional methods that actively engage participants - such as simulations, problem-based tasks, and opportunities to make and learn from mistakes - improve knowledge retention and enhance the likelihood of transfer (Blume et al., 2010). These design features create the initial conditions necessary for transfer but do not guarantee that it will occur, since application depends heavily on factors beyond the training environment.

Trainee characteristics represent a second domain of influence. Learners’ cognitive abilities, motivation, and preexisting skills all affect how effectively they process training content and whether they are inclined to apply it later. Motivation to transfer is particularly important, as it functions as the psychological bridge between learning and behavior change. Learners who are committed to applying new skills are more likely to seek opportunities to do so and to persist in the face of challenges (Baldwin & Ford, 1988; Baldwin et al., 2017; Grossman & Salas, 2011). This highlights the importance of capacity development interventions that foster not only competence but also the belief in and intention to use newly acquired abilities.

The work environment is the third and perhaps most decisive factor in the transfer process. Research consistently underscores the importance of what is referred to as the “transfer climate” - the degree to which organizational cues, norms, and resources support or hinder the application of learning (Grossman & Salas, 2011). A supportive climate includes supervisor and peer reinforcement, the provision of time and tools to practice, and organizational policies that reward innovation and skill application. Without such supports, learners may revert to established routines, and training investments are likely to yield minimal impact. Newer reviews, including those examining online and e-learning contexts, reaffirm that the presence of strong transfer climates can compensate for the limitations of remote or digital formats, while weak climates undermine even the most well-designed training programs (Blume et al., 2010; O’Neill et al., 2025).

Building on these insights, Alagaraja and Shuck (2015) proposed the Organizational Alignment–Engagement Model, which extends the idea of transfer climate by linking structural alignment and psychological engagement as dual mechanisms that enable learning to be applied on the job. Organizational alignment refers to the vertical fit between individual goals and broader strategy as well as the horizontal consistency of HR systems and practices, creating clarity and coherence across levels. Engagement, defined through vigor, dedication, and absorption, represents the motivational energy individuals bring to applying learned skills. The model posits that when HR systems are transparent, fair, and strategically aligned, they cultivate engagement, which in turn strengthens the likelihood that training outcomes will be translated into performance improvements. In this sense, alignment and engagement function as reinforcing conditions that bridge the gap between training inputs and observable performance, complementing Baldwin and Ford’s original model by specifying how system-level supports and employee motivation jointly sustain transfer (Alagaraja & Shuck, 2015).

Cooke et al. (2018) reinforce this emphasis on environmental and relational supports, showing that transfer is sustained not only through alignment and engagement but also through networks, mentoring, and distributed leadership. In this context, “networks” encompass structured communities of practice, peer coaching triads, project-based working groups, and research-active units that expose learners to role models and normative cues for the desired behavior; these networks operate through mechanisms such as social reinforcement, identity-based motivation, and timely information flows that lower the friction of applying new skills (Cooke et al., 2018). Their findings highlight that transfer climates are strengthened when learners are embedded in research-active environments with role models, peer communities, and leaders who reinforce new practices. However, peer communities tend to be beneficial only under specific conditions: they require a clearly defined purpose linked to participants’ mandated work, facilitation that maintains cadence and psychological safety, explicit time allocation, production of tangible work artifacts that feed back into workflows, and visible sponsorship or recognition so participation is consequential (Cooke et al., 2018; Alagaraja & Shuck, 2015). Absent these conditions, communities of practice commonly stagnate - attendance becomes optional, discussions decouple from job tasks, and the perceived return on time declines - which weakens the social mechanisms needed for transfer (Grossman & Salas, 2011; Cooke et al., 2018).

The underlying mechanisms of change in these models are multifaceted. First, instructional quality facilitates knowledge acquisition and initial competence. Second, learner motivation determines the effort invested in applying knowledge. Third, environmental reinforcement either sustains or erodes new behaviors over time. Together, these mechanisms create a causal chain: training inputs lead to learning, which generalizes into workplace behaviors when motivation and environmental supports are present, ultimately resulting in performance improvements and career outcomes. Framed this way, transfer theory explains why instruction that is not followed by explicit post-training supports - for example, supervisor check-ins, job aids embedded in workflow, prompts and reminders, and opportunities to practice on real tasks - is unlikely to yield durable behavior change (Grossman & Salas, 2011). The distinctive practical implication of this cluster is prescriptive rather than generic: design for transfer by engineering the surrounding context and routines that cue, enable, and reward use, rather than relying on diffusion from the classroom (Blume et al., 2010; Alagaraja & Shuck, 2015).

### Behavior-Change and Implementation Science Theories of Change: COM-B and the Behaviour Change Wheel

Another family of theories of change that has become increasingly influential in capacity development is drawn from implementation science and behavioral psychology, particularly the COM-B model and the associated Behaviour Change Wheel (BCW). These frameworks shift attention from the acquisition of skills alone to the broader determinants of whether new skills are consistently enacted in practice. They provide a structured way to diagnose why behaviors do or do not change following training and to design interventions that address those barriers systematically.

The COM-B model, developed by Michie and colleagues, proposes that behavior (B) emerges only when three conditions are present: Capability (C), Opportunity (O), and Motivation (M) (Michie et al., 2011). Capability refers to both psychological and physical capacities, including knowledge, reasoning, and technical skill. Opportunity encompasses the external social and physical environment that affords or restricts the behavior - for instance, access to resources, supportive peer norms, or workplace structures. Motivation includes both reflective processes (such as conscious decision-making and goal-setting) and automatic processes (such as habits and emotional responses). The theory of change implied here is that an intervention that targets only one element, such as building knowledge through training, is unlikely to sustain behavioral change unless opportunity and motivation are also addressed. Capacity development activities therefore contribute primarily to psychological capability, but their impact depends on parallel strategies that enable learners to act on their skills and remain motivated to do so (Michie et al., 2011).

The Behaviour Change Wheel expands on this diagnostic framework by linking each component of COM-B to a range of intervention functions and policy levers (Michie et al., 2014). For example, when capability deficits are identified, training and education are appropriate intervention functions; when opportunities are lacking, strategies such as restructuring the physical environment, adjusting workflows, or strengthening social support may be required; and when motivation is weak, incentives, persuasion, or habit-forming techniques may be introduced. By integrating diagnosis with intervention design, the BCW provides a systematic method for ensuring that behavior-change interventions are comprehensive and context-sensitive. The implication for capacity development is clear: moving from learning to consistent performance requires deliberate pairing of training with complementary strategies that modify opportunity and motivation, such as prompts and reminders, peer reinforcement, or incentive systems (Michie et al., 2014).

Evidence from systematic reviews and empirical studies reinforces the relevance of these frameworks. In professional development and health workforce training, multicomponent strategies that combine education with audit and feedback, reminders, and supportive supervision have been shown to improve adherence to best practices and, in some cases, patient outcomes (Fontaine et al., 2024; Robinson et al., 2024). These findings align with the COM-B model’s central claim that educational interventions targeting capability alone are insufficient, and that opportunity and motivation must also be activated for behavior change to endure. In low- and middle-income country (LMIC) contexts, where health worker performance is often constrained by systemic challenges, interventions that integrate supervision, feedback loops, and supportive peer networks alongside formal training have been particularly effective (Gudlavalleti et al., 2024). Such results underscore that behavior change in complex settings cannot be reduced to individual skill acquisition but requires addressing contextual barriers and enablers at multiple levels.

Taken together, COM-B and the Behaviour Change Wheel articulate a powerful theory of change for capacity development: training contributes to capability, but the consistent enactment of desired behaviors depends on the interaction of opportunity and motivation as well. Interventions designed with this perspective explicitly account for the broader social and organizational environment, ensuring that skills are not only acquired but also practiced, reinforced, and sustained. This approach provides a pragmatic bridge between theories of adult learning and the realities of organizational and systemic constraints, making it especially relevant for capacity development efforts in both high-income and resource-constrained settings.

### Competency-Based Education and Assessment: Miller’s Pyramid and Entrustable Professional Activities

Competency-based education (CBE) represents a major shift in how capacity development is conceptualized, structured, and evaluated. Unlike traditional models that emphasize time-based progression or content coverage, CBE defines explicit competencies required for professional practice and deliberately aligns curriculum, instruction, and assessment around those outcomes. The core logic of this approach is that learners should progress not by completing a predetermined sequence of courses, but by demonstrating mastery of clearly articulated skills and behaviors that are directly relevant to professional performance (Misra et al., 2021). This logic positions CBE as a theory of change that links educational inputs to real-world outcomes by making the demonstration of competence, rather than exposure to instruction, the central driver of advancement.

A central framework within CBE is Miller’s Pyramid of Competence, which describes the staged progression from knowledge acquisition to professional performance. At its base, learners begin with factual knowledge (“knows”) and progress to understanding how to apply that knowledge in context (“knows how”). The next level emphasizes performance under simulated conditions (“shows how”), culminating in the highest level - actual performance in the workplace (“does”) (Witheridge et al., 2019). The implication for capacity development is that learning cannot be considered complete until learners reach the “does” level, where competence is consistently enacted in real-world practice. This framework provides a roadmap for designing interventions that gradually scaffold learners from theoretical knowledge toward authentic, applied expertise.

Assessment is the engine that drives progression up Miller’s Pyramid. Within CBE, repeated, authentic, workplace-based assessments play a critical role in signaling when learners are ready to advance and in providing feedback that supports continuous improvement. Mechanisms such as Entrustable Professional Activities (EPAs) have become increasingly important in this regard. EPAs are units of professional practice - tasks or responsibilities - that can be entrusted to a learner once they have demonstrated sufficient competence. By linking assessment directly to professional responsibilities, EPAs create a structured bridge between classroom instruction and workplace performance, making explicit the readiness of learners for increased autonomy (Kerth et al., 2024). The repeated cycle of performing tasks, receiving feedback, and being progressively entrusted with more responsibility is the mechanism by which CBE fosters not only skill transfer but also professional identity formation and career advancement.

Recent reviews of CBE highlight both the promise and the challenges of implementing this model in diverse contexts. Misra et al. (2021) emphasize that CBE requires deliberate alignment between competencies, assessment practices, and feedback systems in order to function effectively. Without this alignment, learners may accumulate fragmented skills without clear pathways to full professional competence. Witheridge et al. (2019) further argue that Miller’s Pyramid provides an essential conceptual anchor, ensuring that CBE programs focus not only on knowledge but on actual performance in practice. More recent studies highlight innovations in EPA-based assessment and feedback loops, underscoring the importance of embedding these mechanisms into daily professional workflows (Kerth et al., 2024).

When integrated, CBE, Miller’s Pyramid, and EPAs form a coherent model in which defined competencies guide educational design, authentic assessments deliver continuous feedback, and entrustment mechanisms connect learning directly to professional responsibilities. This model links educational experiences to performance and career outcomes by ensuring that learners are not only exposed to knowledge but are progressively assessed, supported, and trusted to enact competencies in the workplace. The broader implication for capacity development is that technical instruction alone is insufficient: meaningful outcomes require sustained systems of assessment and feedback that create pathways from knowledge acquisition to professional practice and advancement.

### Developmental Relationships: Coaching and Mentoring Theories of Change

Developmental relationships - particularly coaching and mentoring - represent a distinct pathway through which capacity development activities are translated into enhanced capabilities, performance, and long-term career outcomes. Both approaches share the premise that structured interpersonal support facilitates the application of knowledge and skills in real-world settings, but they operate through different mechanisms and emphasize different types of outcomes. Coaching is primarily goal-focused and performance-oriented, while mentoring encompasses a broader set of psychosocial and career-development functions. Together, they form a complementary cluster of theories of change that explain how learning is reinforced, internalized, and extended beyond the training environment.

Coaching has been conceptualized as a structured, collaborative process in which a coach supports a learner or professional to achieve specific, goal-directed outcomes. The theory of change underlying coaching rests on the idea that cycles of goal setting, practice, feedback, and accountability enable individuals to transform learning into sustained improvements in behavior and results (Cannon-Bowers et al., 2023). Through this process, coaching strengthens critical psychological mechanisms such as self-regulation and self-efficacy, which are essential for transferring skills from the training environment into workplace performance. Meta-analyses, including those restricted to randomized controlled trials, consistently report that coaching interventions produce positive effects across multiple domains, including task performance, acquisition of new skills, well-being, and goal-directed behavior (de Haan & Nilsson, 2023; Nicolau et al., 2023). Importantly, coaching works not merely by reinforcing technical skills but by helping individuals develop the confidence, persistence, and strategic focus needed to apply those skills in dynamic, real-world contexts. In this way, coaching extends the reach of capacity development interventions by embedding individualized support into the process of skill application and consolidation.

Mentoring, by contrast, is typically less narrowly focused on immediate performance outcomes and instead emphasizes long-term personal and professional development. It involves a more experienced individual providing guidance, feedback, and support to a less experienced mentee. The theory of change for mentoring is grounded in its ability to combine career-related and psychosocial functions. Career-related functions include sponsorship, advocacy, and access to networks and opportunities that might otherwise remain closed to the mentee. Psychosocial functions encompass role modeling, identity work, and emotional support, all of which help individuals navigate challenges and build resilience (Eby et al., 2008). The mechanisms of mentoring thus operate at both structural and relational levels: by expanding mentees’ social capital, offering feedback and modeling effective behaviors, and affirming professional identities, mentoring facilitates not only improved performance but also advancement in terms of promotions, earnings, and job satisfaction. Large meta-analyses and reviews affirm the generally positive effects of mentoring, while also noting that outcomes are moderated by contextual factors such as gender, organizational culture, and professional field (Ivey & Dupré, 2022).

These insights align with findings from Cooke et al. (2018), who, in a realist synthesis of research capacity development in health and social care, identified trust, reciprocity, and identity formation as key relational mechanisms enabling sustained capacity development. Although their primary focus was not on coaching or mentoring, the mechanisms they highlight parallel those found in developmental relationships: trust supports openness and risk-taking in learning; reciprocity underpins mutual commitment to growth; and professional identity work reinforces the integration of new skills into long-term career trajectories. Cooke et al. also emphasize the importance of embedding these relational mechanisms within institutional scaffolding - such as networks, supportive policies, and organizational reinforcement - echoing broader findings that the success of mentoring and coaching is shaped not only by dyadic interactions but also by the surrounding organizational context.

When viewed together, coaching and mentoring articulate complementary theories of change that highlight the centrality of relationships in capacity development. Coaching creates structured opportunities for learners to transform knowledge into practice through cycles of accountability and feedback, thereby strengthening self-regulatory capacities that drive short- to medium-term performance. Mentoring, in contrast, embeds individuals in developmental relationships that expand networks, shape professional identity, and sponsor career opportunities, thereby influencing longer-term outcomes such as advancement and satisfaction. Both approaches illustrate that capacity development is not only a function of instructional design but also of sustained interpersonal engagement that reinforces and extends learning.

### Training Cascade Models: Scaling Capacity Through Sequential Training

Training cascade models explain how knowledge and skills introduced at one level of an organization are disseminated through sequential or hierarchical training processes. Typically, a small group of master trainers receives intensive preparation and then assumes responsibility for training subsequent cohorts, who may in turn continue the cascade. This approach is especially prevalent in large-scale capacity development programs in health, education, and public service sectors, where resource constraints or geographic dispersion make centralized delivery impractical. The underlying theory of change posits that by equipping a strategically selected group of trainers, organizations can achieve widespread and sustainable capacity development at scale.

Recent conceptual work has expanded this model beyond its traditional linear framing. Mormina and Pinder (2018) propose the TRAIN framework, which integrates systems thinking and network theory to capture the relational and structural factors shaping cascade outcomes. The model highlights the concept of “amplification,” whereby feedback and learning from lower tiers can inform higher-level training, making the cascade bidirectional rather than purely top-down. This framing challenges simple diffusion logics and aligns more closely with the complexity of real-world organizations. The TRAIN framework emphasizes five interdependent design elements: Talent (selecting trainers with both technical expertise and adult learning skills, supported by recognition and career incentives), Resources (ensuring time, materials, infrastructure, and funding for delivery), Alignment (linking training content to organizational priorities and accreditation systems), Implementation (embedding governance mechanisms such as procedures and supervision), and Nurture (providing follow-up supports such as mentoring, refresher training, and peer networks). Together, these elements function as enabling conditions that convert training opportunities (capabilities) into effective professional practice (functionings).

From a causal perspective, cascade models assume that if these five elements operate in concert, the transfer of knowledge from master trainers to successive cohorts can be achieved with sufficient fidelity and relevance to impact performance and service delivery. When these conditions are missing, cascade initiatives often experience fidelity loss or uneven outcomes, with some cohorts unable to sustain or adapt the training effectively (Leeman et al., 2017). Empirical studies caution that without strong accountability mechanisms, supervision, and contextual adaptation, cascade models risk reinforcing disparities rather than reducing them. At the same time, evidence also suggests that when cascade approaches are complemented by embedded coaching or mentoring, they can provide effective scaffolding for distributed capacity development, balancing efficiency with sustained impact.

The implication for theories of change is that cascade models highlight a unique pathway from training to system-wide capacity: individual competence at the trainer level must be embedded within supportive structures and feedback-rich systems if it is to diffuse effectively through organizations. In resource-constrained environments, this model underscores the importance of designing not only for individual learning but also for the relational and structural conditions that enable skills to spread, adapt, and persist at scale (Mormina & Pinder, 2018; Leeman et al., 2017).

### Practice-Intensive Models: Deliberate Practice and Error Management Training

A final family of theories of change emphasizes the central role of intensive practice methods in consolidating learning and ensuring transfer to workplace performance. Two approaches - deliberate practice and Error Management Training (EMT) - illustrate how carefully structured practice environments can move learners beyond surface-level competence to deeper adaptive expertise. Both frameworks underscore that repeated, feedback-rich engagement with challenging tasks is essential for embedding skills, while also highlighting different mechanisms by which learners develop the ability to perform effectively in unpredictable, real-world settings.

Deliberate practice theory, originally developed in the study of expert performance, posits that expertise is not simply the product of accumulated experience but of structured, goal-directed practice carried out under conditions of continuous feedback and progressive difficulty (Hambrick et al., 2020). Within capacity development, deliberate practice involves designing opportunities for learners to focus on specific tasks, repeat them intensively, receive immediate and targeted feedback, and gradually progress to more complex challenges. The mechanism of change here lies in the iterative cycle of repetition and feedback, which promotes automatization of skills while also building the flexible knowledge structures required for adaptation in novel contexts (Barata et al., 2024). Over time, such practice strengthens both technical proficiency and adaptive expertise - the capacity to transfer learning across situations and innovate in the face of uncertainty. Although debates continue regarding the overall magnitude of deliberate practice’s effect on performance across fields, applications in professional training, such as psychotherapy, medicine, and education, consistently show measurable benefits when practice is designed to be intentional, structured, and feedback-rich (Debatin, 2023).

Error Management Training (EMT) extends the logic of practice-intensive methods by theorizing errors as central triggers of learning and adaptation rather than as disruptions to be avoided. Drawing on action theory, EMT conceptualizes errors as feedback that reveals gaps in a learner’s mental models and stimulates reflection, problem-solving, and strategy revision (Keith & Frese, 2008). Rather than aiming for flawless execution, EMT cultivates a mindset in which mistakes are framed as informative signals - opportunities to test boundaries, refine understanding, and develop more resilient action strategies. This process activates metacognitive regulation, as learners monitor and adjust their approaches, and emotion control, as they learn to manage the frustration and uncertainty associated with failure (Keith & Frese, 2008). The theory of change underlying EMT thus posits that by embedding errors into training design - through minimal guidance, active exploration, and explicit error-encouragement - learners develop adaptive expertise: the ability to flexibly apply skills in novel, unpredictable, and complex contexts. In this way, EMT links capacity development activities not merely to immediate task competence but to deeper individual capabilities such as resilience, transfer of learning, and the capacity to grow through future challenges (Keith & Frese, 2008).

Deliberate practice and EMT articulate complementary theories of change that explain how practice design influences not only the acquisition but also the adaptability of skills. Deliberate practice highlights the role of structured repetition and incremental challenge in achieving proficiency and flexibility, while EMT demonstrates the importance of creating psychologically safe spaces where learners can engage with errors productively. Both models underscore that practice is not a passive process of repetition but an active, reflective engagement with tasks that builds durable and transferable expertise. For capacity development, the implication is that interventions must go beyond one-time instruction and integrate sustained, feedback-rich practice environments that encourage both mastery and adaptability. Only then can learners consolidate skills in ways that prepare them not just for routine tasks but also for the uncertainties and complexities of real-world professional practice.

## Comparative Insights Across Theories

Despite differing vocabularies, the clusters converge on a compact set of mechanisms that mediate the journey from instruction to impact. First, motivation and identity recur as linchpins: satisfaction of autonomy/competence/relatedness (SDT), strengthened self-efficacy, and salient, specific goals with feedback consistently predict persistence and on-the-job application (Ryan et al., 2022; Locke & Latham, 2007, 2013; Somuah et al., 2024; McAnally et al., 2024). Second, practice and feedback drive consolidation: experiential cycles, deliberate practice, and error-management protocols embed skills and build adaptive expertise when feedback is frequent and task difficulty is scaffolded (Morris, 2020; Hambrick et al., 2020). Third, contextual opportunity and reinforcement determine durability: transfer climate, structural alignment, supervision, and peer networks are decisive for sustained behavior change (Baldwin & Ford, 1988; Grossman & Salas, 2011; Alagaraja & Shuck, 2015; Cooke et al., 2018). These three strands map closely to COM-B’s capability–opportunity–motivation triad and help explain why content-only interventions often underperform (Michie et al., 2011).

The clusters operate at different levels and phases of change but are mutually reinforcing. Adult learning and competency-based education primarily cultivate capability and make performance criteria visible (Witheridge et al., 2019; Misra et al., 2021; Kerth et al., 2024). Social–cognitive and NCI approaches strengthen motivation, self-regulation, and trait-like enablers that sustain effort and transfer (Williams et al., 2022; Jajoo & Deshmukh, 2024). Coaching and mentoring supply relational scaffolding - accountability, sponsorship, identity work - that supports both near-term behavior change and longer-term career outcomes (de Haan & Nilsson, 2023; Eby et al., 2008). Implementation science frameworks and transfer models diagnose and engineer opportunity structures (policies, workflows, cues) that make the desired behavior feasible and normative (Michie, 2014–2015; Blume et al., 2010; O’Neill et al., 2025). Practice-intensive methods accelerate skill consolidation and adaptability, while cascade models address scaling and diffusion under resource constraints, conditional on robust selection, resourcing, alignment, implementation governance, and nurturing supports (Mormina & Pinder, 2018; Leeman et al., 2017).

The clusters vary in (a) temporality - from short-cycle skill acquisition to identity formation and career sponsorship; and (b) linearity - cascade models presume directional diffusion, whereas realist-informed and relationship-centric accounts emphasize recursive learning and network effects. Rather than presenting contradictions, these divergences illustrate how different theoretical traditions illuminate complementary facets of the capacity development process.

Taken together, the clusters imply a coherent meta-ToC: capacity-development activities build capability (adult learning, CBE; deliberate practice), strengthen motivation and intention (SDT, self-efficacy, goals, NCIs), and engineer opportunity structures that cue and reward enactment (transfer climate, alignment, COM-B/BCW). Relational mechanisms (coaching, mentoring) and assessment systems (Miller’s Pyramid, EPAs) maintain focus and provide credible signals of readiness, while scaling mechanisms (cascades) diffuse practices when embedded in supportive systems. Durable individual-level change thus emerges when these components co-activate and are tuned to context (Baldwin & Ford, 1988; Michie et al., 2011; Alagaraja & Shuck, 2015; Cooke et al., 2018). For evaluation capacity development (ECD), however, the implication is not that all mechanisms must be orchestrated simultaneously - which is rarely feasible - but that interventions can be strengthened by explicitly considering where their sphere of influence begins and ends. Short courses or workshops may realistically influence capability and, to some extent, motivation; deeper traits and organizational opportunity structures often require parallel or subsequent interventions. The synthesis therefore suggests that ECD initiatives should be pragmatic: prioritize participants who are positioned to apply skills, design with motivational levers in mind, and seek linkages to enabling organizational or systemic conditions wherever possible, while recognizing that partial gains are still meaningful even when all pathways are not activated at once.

## Conclusion

This literature review set out to examine the primary theories of change that explain how capacity development activities produce individual-level outcomes such as improved capabilities, workplace performance, and career advancement. The purpose was not simply to catalog theories but to clarify the causal logics, mechanisms, and enabling conditions that link interventions to sustained professional growth. By organizing the literature into clusters - ranging from adult learning traditions and motivational models to transfer frameworks, implementation science, and relational and practice-based approaches - the review sought to bring conceptual discipline to a field that is often fragmented and diffuse.

A thematic synthesis of insights reveals that durable outcomes emerge when three conditions operate in concert. First, capability must be cultivated through relevant, practice-intensive, and progressively authentic forms of learning. Models such as andragogy, experiential learning, Miller’s Pyramid, and deliberate practice converge on the idea that knowledge acquisition alone is insufficient; competence consolidates when individuals repeatedly enact and reflect upon tasks under conditions of feedback and incremental challenge (Kolb, 1984; Witheridge et al., 2019; Hambrick et al., 2020). Second, motivational and self-regulatory mechanisms are consistently theorized as critical supports for transfer. Yet, because these are partly shaped by learners’ dispositions and organizational environments, they cannot be fully engineered by a short-term intervention. This does not render individual capacity development futile: even partial strengthening of motivation and confidence - through feedback, goal-setting, or coaching - can make meaningful differences in how skills are applied (Ryan et al., 2022; Somuah et al., 2024). Third, opportunity structures - transfer climates, organizational alignment, supervision, peer networks, and policy incentives - are decisive in determining whether learning is consistently enacted and rewarded in practice (Baldwin & Ford, 1988; Grossman & Salas, 2011; Alagaraja & Shuck, 2015; Michie et al., 2011). These contextual supports transform potential into actual performance by embedding learning into everyday workflows and reinforcing it socially and institutionally.

Theories also highlight relational and systemic enablers that bridge these three conditions. Coaching and mentoring supply interpersonal scaffolding that strengthens self-regulation, expands networks, and sponsors career advancement (de Haan & Nilsson, 2023; Eby et al., 2008). Implementation science frameworks like COM-B clarify that without addressing opportunity and motivation alongside capability, behavior change is unlikely to endure (Michie et al., 2011). Cascade models illustrate how capacity can be scaled when trainer competence is combined with supportive governance and feedback-rich systems, but they also caution that fidelity and sustainability falter without alignment and nurturing supports (Mormina & Pinder, 2018; Leeman et al., 2017). Across these strands, the mechanisms of change operate not in isolation but in layered and interdependent ways, such that breakdowns at any point - whether in instructional design, motivational engagement, or contextual reinforcement - diminish the likelihood of sustained outcomes. At the same time, the literature suggests that even when only some pathways are activated, interventions can still generate incremental gains that matter for professional practice.

For evaluation capacity development (ECD), these insights carry clear implications. Strengthening evaluators’ skills requires more than training in methods; it requires embedding opportunities for applied practice, feedback, and progressive assessment of competence (Misra et al., 2021; Kerth et al., 2024). Motivational supports are equally vital: evaluators are more likely to apply skills when their autonomy, competence, and professional identity are reinforced through coaching, mentoring, and recognition systems (Ryan et al., 2022; Cooke et al., 2018). Finally, opportunity structures are decisive: without institutional climates that reward evidence use, align evaluations with organizational goals, and provide platforms for dissemination, individual skills may remain underutilized (Baldwin & Ford, 1988; Alagaraja & Shuck, 2015). Yet in practice, not all of these elements will be present or intentionally coordinated. ECD strategies should therefore be pragmatic: design for what is realistically within reach, target participants who are well-positioned to apply new skills, and whenever possible link training to organizational processes that can reinforce and scale learning. Even if only some of the theorized mechanisms are activated, interventions can still strengthen evaluators’ practice and gradually build momentum for broader institutional change.

The review demonstrates that theories of change linking capacity development to individual outcomes converge on a demanding but coherent logic: interventions must simultaneously build capability, energize motivation, and enable opportunity, while embedding these processes within feedback-rich, relational, and systemic supports. In real-world contexts, this is best understood not as an all-or-nothing prescription but as a menu of levers that can be combined in context-appropriate ways. When these conditions co-activate, individuals are not only more likely to acquire new knowledge but also to apply, adapt, and sustain it, thereby achieving meaningful improvements in performance and career growth (Cooke et al., 2018; Michie et al., 2011; de Haan & Nilsson, 2023). In short, effective capacity development is not an event but an ecosystem, where causal mechanisms are designed, reinforced, and aligned to generate durable professional outcomes.

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