
Complex problem solving through action learning: implications for human resource development

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Abstract: This paper argues that complex problems can be used as opportunities for action learning, and examines the interrelations between problem solving and action learning. It suggests that managerial thinking and reflective action taking can be enhanced through complex problem solving. The paper contributes to theory and practice as it extends the literature on action learning by understanding its efficacy in the context of complex problems. Much of the literature is concerned with learning and action taking without examining the complexity of problems as affecting the metacognition as associated with learning. The paper brings a new practical dimension to action learning by expanding its scope on the problem, group, and action taxonomies to enhance human resource development (HRD).

Keywords: action learning; complex problem solving; human resource development; HRD; metacognition.

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1 Introduction

Increasingly, the problems that organisations face have become ever more complex and difficult, and problem solving has become an even more critical factor for organisational success. Finding appropriate business solutions now requires tremendous insights, systems thinking, and creativity. Neither the typical individual nor traditional problem-solving groups have the capability to fully understand today's problems and develop solutions which are powerful, sustainable, and cost effective (Mitchum and Kelley, 2010). As a consequence, the complexity of problems surfaced in ambivalent environments has led organisations to explore wider approaches to problem solving. Action learning has been found to be one of the most practical and effective problem-solving tools in times like these to help organisations respond to rapid changes (Marquardt, 2011). It is the collaborative and reflective inquiry of action learning that provides the dynamics and engagement for problem solving in meaningful ways (Revas, 1998).

The 21st century workplace is marked by an enormous amount of ambiguity that has arisen from a wide array of rapidly changing socio-economic trends and markets, overnight innovation from competitors, mergers across disparate corporate cultures and industries, new distribution channels, and the globalisation of business. Problem solving has thus become a way of life in challenging times as organisational members, particularly leaders, are required to exercise discretion, take calculated risks, capitalise on the constraints of time and resources, analyse environmental ambivalence, make timely decisions, and take considered action (Marquardt et al., 2009).

The relationship between action learning and HRD is the holistic approach that seeks learning-oriented behavioural change within individuals, groups, and the organisation. Similar to action learning, HRD is facilitated by both planned and systematic interventional activities aimed at unleashing human expertise through a range of learning techniques and strategies for the purpose of improving work performance (Megginson et al., 1993; Stewart, 1991; Swanson, 1995). HRD also involves problem solving and sensemaking when individuals are confronted by unfamiliar issues within a context (Weick, 1995), workplace disturbances creating environmental mystery (Gherardi, 1999), and challenges a result of new tasks and work practices (Watkins, 2000).

2 Purpose of the study

The objectives of this study are:

- a to argue that complex problems can be used as opportunities for action learning
- b to examine the relationship between problem solving and action learning
- c to explore the implications of action learning for HRD.

We further provide a conceptual framework that illustrates the power of complex problem solving through action learning leading to HRD outcomes. The contribution of this study is three-fold. Firstly, it extends the literature on action learning by understanding its importance in addressing and responding to the complexity and messiness of problem contexts. In the current literature, action learning focuses mainly on process and learner control rather than response to problem complexity in relation to the wider organisational context (Pedler, 1996; Raelin, 2006). In other words, much of the literature in this subject is concerned about learning and action taking without examining the influence of problem complexity on these processes (Marquardt and Yeo, 2012; Torbert and Taylor, 2008). Secondly, the study adds to the action learning literature by expanding the scope of the problem, group, and action taxonomies which can collectively bring about powerful organisational solutions. Thirdly, the study sheds light on the conceptual and practical linkages between action learning and HRD.

3 Theoretical background

Both action learning and problem solving share similar theoretical perspectives. Socio-psychology best explains this relationship as it comprises five dimensions, namely humanistic, cognitive, behavioural, social, and constructivist psychology. Firstly, *humanistic psychology* adopts a holistic approach to the understanding of human existence by examining meaning, values, freedom, responsibility, and human potential (Buhler, 1971). This perspective is largely influenced by the philosophy of existentialism and phenomenology. Existentialism is concerned about the conditions of existence of an individual and how these conditions affect his or her emotions, actions, responsibilities, and thoughts. On the other hand, phenomenology refers to the understanding of one's experience or state of being in relation to a context that shapes the experience including directness of involvement and embodiment of social dynamics.

Secondly, *cognitive psychology* explores the mental process of individuals, particularly the way they perceive, think, and respond to situations. It is the understanding of the mental state that accounts for an individual's beliefs, desires, and motivation as represented by worldviews and actions (Simon, 1975). Thirdly, *behavioural psychology* adopts a learning perspective which regards every physical action as a type of behaviour. The assumption is that all humans function like organisms and have the ability to modify their behaviours based on internal (mental state) and external conditions (context). These human behaviours are further classified into internal process as characterised by thoughts and emotions, and external process as determined by actions (George, 1990). Fourthly, *social psychology* is premised on the understanding that human relations in group settings provide the basis for individuals to modify their attitudes, level of influence, and defense mechanisms. It is concerned with the

interpersonal behaviour of individuals and explains the rationale for people to react in a certain way according to their intrinsic intent (Deutsch and Krauss, 1965). Finally, *constructivist psychology* is concerned about the act of knowing as individuals attach meanings to an external entity that they regard as reality. It is the understanding of the human mind which captures and signifies meanings through an interactive response system as the individual makes sense of external events. This suggests that individuals are capable of creating a mental system for connecting their perceptions to the external world based on lived (current) and perceived (projected) experiences (Shotter, 1997).

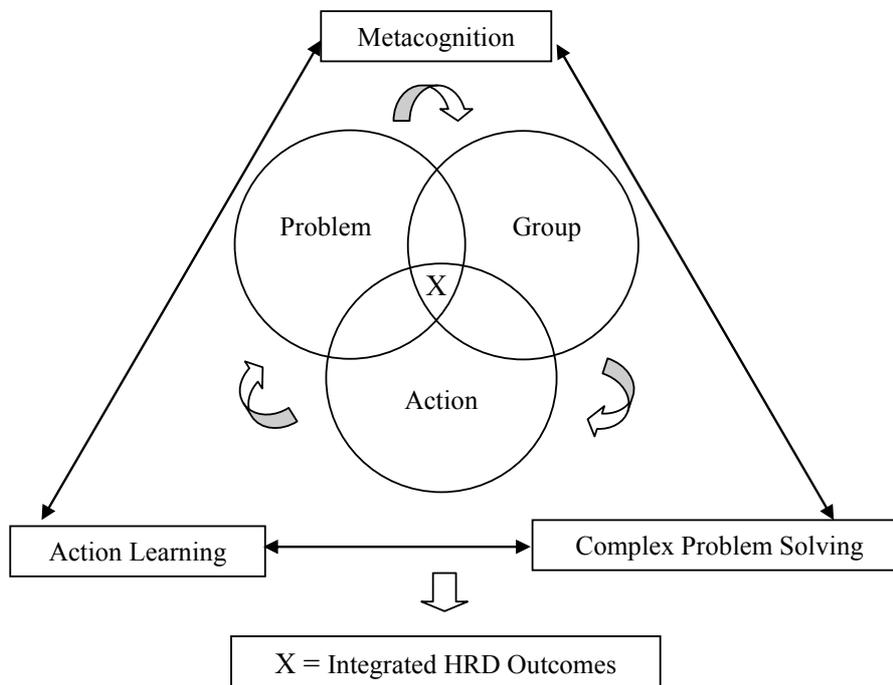
These theoretical perspectives apply to action learning in many ways as it is a process that is governed by internal (cognition) and external (context) conditions determining team members' cognitive and behavioural involvements. As action learning is a collaborative process, team members make sense of these conditions based on their lives and perceived experiences. The social dimension of action learning allows for a dynamic exchange of mental models as team members construct frames of references that guide them in their problem solving and action taking (McLaughlin and Thorpe, 1993). In so doing, they engage in reflection, questioning, dialogue, and feedback to gain a wider and deeper understanding of various issues. Hence, the more complex the problem, the better suited is action learning as the complexity increases cognitive participation as team members engage in self-directed learning and collaborative inquiry to determine the appropriate course of action (Morgan and Ramirez, 1983). Questioning is one of the most powerful features of action learning. It involves not only problem framing in the form of questions but also refines broad issues into focused problem statements that can be used to generate systems thinking (Atwater et al., 2008). As such, questioning helps to develop a holistic perspective of the organisation, particularly how existing issues can hinder or promote organisational growth. When viewed from a problem-solving perspective, action learning can develop one's systems thinking ability (Senge, 1990).

4 A framework of complex problem solving and action learning

Action learning functions best with ill-structured, intractable, and complex problems which promote double-loop learning allowing team members to question the context and their actions dynamically. Such problems commonly occur in organisational settings and these trigger learning and action simultaneously as they engage in ongoing problem diagnosis and solution formulation (McLoughlin, 2004). If action learning is a type of learning that draws on concrete experience and critical reflection on that experience through dynamic dialogue about complex organisational issues, unlearning is the prerequisite for relearning (Revans, 1982). Unlearning involves the reevaluation and rejection of obsolete and misguided knowledge in order to allow new ideas to develop, while relearning is being open to ideas that lead to alternative outcomes (Hedberg, 1981). Although reflection is a common feature in experiential learning (Kolb, 1984), behavioural learning (Skinner, 1972), organisational learning (Argyris and Schön, 1996), and problem-based learning (Barell, 1998), it operates quite differently in action learning. Reflection in action learning operates at more than one level involving critical reflection and critical self-reflection. According to Gray (2007), reflection is different from critical reflection in that the latter takes the assessment of the validity of an individual's assumptions further by examining both sources and consequences. On the other hand,

critical self-reflection reevaluates the way an individual posed problems and his or her orientation to perceiving, believing, and acting. According to Reynolds (1998), reflection creates a deeper awareness of the social power in collaborative inquiry in addition to focusing on self, allowing team members to question assumptions and draw on their confidence in exploring solutions. Reflection and dialogue, the two key components of action learning, place them within the wider context of organising to consider the importance of power relations that helps promote or truncate learning (Reynolds and Vince, 2004). According to this perspective, we propose a conceptual framework (Figure 1) that illustrates the power of action learning through complex problem solving with implications for HRD.

Figure 1 A proposed framework of action learning and HRD



4.1 *Metacognition, complex problem solving, and action learning*

The framework in Figure 1 illustrates the cognitive and behavioural participation of team members as it deals with how frames of references (metacognition) are formulated to challenge ambiguous contexts (complex problem solving) and develop action plans (action learning) for further conceptualisation and experimentation. The three components interact in mutually-implicating ways to facilitate the dynamics of problem, group, and action taxonomies. These taxonomies are subsets of a larger system that promotes action and learning in organisational contexts (Marquardt and Yeo, 2012). We next explain the three interacting components in greater detail.

Metacognition suggests that individuals do have some control over their cognitions, particularly in the way frames of references are developed to guide them in their actions.

In other words, these mental frames help to call out skills that enable them to plan, monitor, and evaluate their learning process leading to task completion (Ford et al., 1998). Metacognition is related to problem solving, goal-directed learning, and intellectual development manifesting itself most commonly in contexts where learners are confronted with ambiguity and a lack of guidance (Keith and Frese, 2005; Schmidt and Ford, 2003). As problems surface unexpectedly in challenging times, it is important that organisational members are equipped with complex problem solving skills.

Complex problem solving is a process where individuals approach, manage, and address ongoing issues that are highly unpredictable. It requires the problem solver to engage at a higher level of mental consciousness (metacognition) to make sense of what is going on around them (Meyer and Scholl, 2009). Particularly, when problem solving involves collaborative efforts, the level of complexity in resolving issues is intensified, as it hinges on whether the problem at hand can be solved and the motivation required to generate appropriate solutions (Hirschfeld and Bernerth, 2008). As such, the cognitive ability of team members produces mental efficacy and increases team members' belief and motivation needed to promote mutual understanding. Such mental efficacy functions by means of intent where team members engage in a dynamic exchange of mental models to translate unclear concepts into concrete ideas that can be put into practice. It is the ongoing cultivation of problem diagnoses and interpretation of events that help team members to formulate the right course of action (Rudolph et al., 2009). In short, action modifies the problem-solving context leading to a reinterpretation of existing issues and plausible solutions.

Action learning combines problem solving, action taking, and group learning by focusing on the problem context, group dynamics, and action impact. In the process, learning is not only embedded in problem solving but also serves as a catalyst in allowing team members to discover hidden meanings and wider connections as they explore solutions (Marquardt and Yeo, 2012). Through an iterative process of learning and action taking, they are better able to capture essential ideas and solutions at the right moment that will make an impact on the organisation.

In order for the dominant components (metacognition, complex problem solving, and action learning) to function together, which in turn facilitate the subsets of action learning (problem, group, and action), it is important to understand how team members engage in sensemaking, reflection, and feedback. This involves the generative and adaptive functions of cognitive participation (Weick, 1995). In action learning, team members amplify ideas to capture wide-ranging alternatives, the process of which is the generative function of cognition. On the other hand, they also engage in restraining and reducing these alternatives into specific and workable units that can be translated into action plans, also known as the adaptive function of cognition (Raelin, 2000). In the meaning-making and meaning-signifying process, they then engage in the social construction of meanings where metacognition, complex problem solving, and action learning are integrated to allow them to focus on the context (problem), resources (group mental models), and solution (action) in more effective ways (Mitchum and Kelly, 2010).

4.2 Problem context as catalyst for action and learning

Action learning involves the identification of problems, particularly complex problems that confront managers and threaten different aspects of organisational functioning

(Marquardt, 2011). Understanding the problem types will help team members to know where the underlying issues are likely to be rooted and how these problems might be framed in specific terms through, for instance, broad and specific questions as well as probing statements to help with the diagnosis of the problem in an in-depth manner. Understanding the problem and consideration of the context surrounding it are crucial for team members and their interactions with their immediate context. According to Johns (2001), context offers the opportunity and capacity for the explanation of complex organisational phenomena. This argument parallels Revans' (1982) systems alpha, beta, and gamma in relation to action learning. *System alpha* resides between the subjective and objective, moving from personal values to external circumstances and internal resources. In this context, team members ask themselves the following questions: What should be happening? What is stopping it from happening? What can I do to remove the blockage? On the other hand, *System beta* relates to a five-stage process through which team members repeat endlessly to achieve their goals. These stages are survey or observation, hypothesis or theory in formulating courses of feasible action, experiment or test, audit or evaluation of what has happened, and review or ratification where comparisons between expectation and experience are made. Finally, *System gamma* is the interaction between the individual and the situation he or she is trying to influence. Put together, systems alpha, beta and gamma contextualise learning and action based on identified problems. Engaging in the problem context through questioning helps team members to talk out (defining 'what') and talk through (discussing 'why') the underlying issues. Doing this helps them to delve deeper into the symptoms yet maintain a broader perspective of the impact of these issues on the overall organisation (Rudolph et al., 2009).

4.3 *Group dynamics as enablers of action and learning*

Group dynamics are important in the process as it promotes participation involving not only the heart and mind but also a desire to belong (Handley et al., 2007). It also encourages mutual responsibilities and an understanding of behaviours and relationships through collective reflection and action taking. Group diversity increases the dynamics in collaborative settings as it allows individuals from different backgrounds to exchange views increasing the interaction of mental models (Beatty et al., 1993; Torbert and Taylor, 2008). Diversity helps generate different interpretations of the problem for solution formulation. The dynamic exchange of mental frames promotes double-loop learning where team members question underlying assumptions through the use of double feedback loops helping shape action plans (Argyris and Schön, 1996). Receiving and offering feedback in a forward and backward process (double loops) increase team members' propensity to unlearn and relearn (Ng, 2008). Learning becomes second nature when they take pride in being a member of the group. Group membership enhances social relations and brings diverse behavioural patterns into cohesiveness. Learning then becomes embedded in problem solving (Harley, 2001). Further, critical reflection helps team members to find common ground suggesting that not only do they question assumptions related to specific problems but they also question their role and identity in the problem-solving process (Clarke et al., 2006). The depth of reflection helps them to articulate their expectations in realistic terms and reduces the occurrence of self effacement (Raelin, 1997). Self effacement is a condition where team members reject attention to be given on themselves by suppressing the potential to contribute

meaningfully in group settings. This condition restricts cognitive participation among team members affecting psychological safety (Edmondson, 1999). Group membership also eliminates social loafing which is the tendency of team members to put in less effort when working with others than working on their own (Karau and Williams, 1993). It promotes collective cognition leading to shared learning and team effectiveness (Rentsch and Klimoski, 2001).

4.4 Action in problem solving through action learning

The relationship between problem solving and action learning is determined by the problem-oriented nature of learning that gives rise to action. However, action is more than problem solving as it captures both the cognitive and behavioural aspects of individuals based on their action and learning. Action is the behavioural representation of cognitive participation where team members turn abstract conceptualisation into some form of concrete experimentation (Kolb, 1984). In so doing, learning is situated in practice where they challenge assumptions, routines, and norms helping them modify consequent action plans (Brown et al., 1989). Problem solving often operates at the micro level, the process of which is investigative in nature, requiring individual and collaborative inquiry to develop concrete actions that will lead to plausible solutions (Fuchs, 2007). When new meanings and structures emerge in collaborative inquiry, learning is enhanced through the influential power of action taking (Rimanoczy and Turner, 2008). As such, action is not merely an enactment of collaborative know-how but also involves interpreting and cultivating diagnoses. In this respect, action enables team members to generate new information by simplifying complex problem issues. As a process, action taking is characterised by mentally organising the execution of each step, physically preparing, executing, anticipating a response from the environment, and developing an awareness of the potential outcomes (Weick, 1995). When team members engage in action taking, they also make sense of what they believe as their perceived reality and connect it to the lived experience by modifying their frames of references for future action (Yeo and Nation, 2010). Problem solving is an essential way of generating the experience of learning *through* action and learning *in* action (Marquardt, 1999). The overall process also involves decision making at various levels through procedural, structural, systems, and strategic development. Ultimately, it is the learned action that makes a difference to the organisation as it heightens team members' learning-to-learn attitude, leading them to develop new knowledge and more powerful actions (Raelin, 2000).

5 Taxonomies of action learning for HRD

We next present three taxonomies of action learning that have an influence on HRD: problem taxonomy, group taxonomy, and action taxonomy (Marquardt, 2011; Marquardt and Yeo, 2012; Ramirez, 1983; Trehan and Pedler, 2010; Yeo and Nation, 2010). When action learning is integrated into HRD activities, it provides opportunities for creating a dynamic learning environment that increases knowledge exchange and application. With appropriate exploration and exploitation of knowledge through complex problem solving in action learning, individuals' thinking and experimentation skills can be enriched to

create greater competitive advantage for the organisation. Exploration refers to the generation of new knowledge while exploitation refers to the reuse of existing knowledge for a specific purpose (Holmqvist, 2004). Action learning can contribute to training and development in a strategic manner where work problems can be used as a catalyst for continuous learning and experimentation (Valentin, 2006). Table 1 illustrates the practical implications of action learning for HRD based on the literature.

Table 1 Practical applications of action learning for HRD

<i>Action learning taxonomies</i>	<i>Theoretical perspectives</i>		<i>Diagnostic questions for action learning groups</i>	<i>HRD outcomes</i>
PROBLEM	Complex problems allow action learning members to construct multiple meanings through reflection and dialogue (Mitchum and Kelley, 2010). Employees with early exposure to complex problems before embarking on actual tasks tend to experience higher performance than those with minimal exposure (Holmqvist, 2004; Rudolph et al., 2009).	1	Is the chosen problem urgent and directly relevant to the business of the company?	1 Develop an ability to understand complex problems in a systemic way.
		2	Has the problem been framed and reframed from different angles?	2 Explore various alternative approaches to understanding and solving complex problems.
		3	Do all the members own the problem?	3 Analyse hidden issues and develop the courage to discuss them with the relevant people in the organisation.
		4	Have the members asked 'what if' questions about the problem?	
		5	Have the members explored potential issues embedded in each question?	
GROUP	Group diversity helps to generate a range of attitudes, values, and behaviours that contribute to productive action learning projects (Argote et al., 1995; Beaty et al., 1993). Group dynamics promote double-loop learning through the questioning of assumptions and consideration of the impact action will bring to the organisation (George, 1990; Ng, 2008).	6	Has the group encouraged participative and team-oriented leadership?	4 Develop collaborative inquiry through collective decision making.
		7	Does the group work cross-functionally?	5 Embrace group diversity as a way of managing employees with different backgrounds and experiences.
		8	Does the group comprise different levels of employees?	6 Utilise collectiveness as a powerful source for responding to environmental uncertainty and change.
		9	Has the group extended their working relationships vertically and horizontally?	
		10	Has the group demonstrated collective responsiveness to change?	

Table 1 Practical applications of action learning for HRD (continued)

<i>Action learning taxonomies</i>	<i>Theoretical perspectives</i>	<i>Diagnostic questions for action learning groups</i>	<i>HRD outcomes</i>
ACTION	Action is the behavioural manifestation of cognitive mapping where the individual turns abstract conceptualisation into some form of concrete experimentation (Kolb, 1984). Action is not merely an enactment of collaborative know-how; it is a type of practice that situates learning, and involves acting, interpreting and cultivating diagnoses (Rimanoczy and Turner, 2008). Action involves members generating new information by simplifying complex issues that make up the problem (Rudolph et al., 2009).	11 Are the group's actions generative or adaptive in nature?	7 Combine calculated risk taking with assumption testing to develop accountable actions.
		12 Has the group experimented with different actions and determined the most appropriate action to solve the problem?	8 Utilise strategic thinking to develop actions that will make an impact on leadership and the organisation.
		13 Has the group assessed opportunities for improvement and implemented creative solutions?	9 Modify existing ideas and develop new action plans to achieve effective leadership and organisational outcomes.
		14 Has the group adopted a business-impact perspective in developing potential solutions?	
		15 Will the group's actions lead to sustainable results?	

5.1 Problem taxonomy

Exclusivity of the problem for the action learning group. This is essential as team members engage in problem solving based on the unique challenges of the problem. When the problem is shared between groups, duplication of resources and efforts can cause intergroup conflict leading to confusion and learning disruption where team members are distracted from tackling the real issues. The only way to reduce the power of diffusion in problem solving is to allow every member to take charge of the problem entirely in order to promote responsibility and accountability. From the HRD perspective, the underlying motivation for action learning is to allow team members to use the problem at hand to trigger a series of learning activities. Multiple diagnoses as a result of

conflicting mindsets truncate learning and create tension among them restricting bold action taking (Louis and Sutton, 1991).

Suitability of the problem for the action learning group. The chosen problem should contribute to the learning and development of team members and allow them to explore the solutions in a safe environment. If the scope of the problem is too wide or too narrow with team members having different interpretations of the problem, the group will experience dissension affecting cohesiveness. In order to promote learning through action taking, the problem should provide sufficient scope for team members to take bold steps in their solution seeking. These steps are guided by reflection, dialogue, and feedback which facilitate the sensemaking of the problem and its impact on their immediate context in significant ways (Mitchum and Kelley, 2010; Weick, 1995). HRD practitioners can help to identify suitable organisational problems that promote intrinsic mutual participation in action learning. They should ensure that the overall process not be influenced by power and politics which may suppress genuine contribution by team members (Stewart, 1991).

Empowerment of team members through ownership of the problem. Taking ownership of the problem in action learning is a challenging task as it is very much a choice of individual learners. Ownership involves the internalisation of the problem as part of the group's responsibility for improving organisational life such as improving the work environment (Rudolph et al., 2009). Once team members view their involvement as making an impact on the organisation, they will be readier to unlearn and relearn. They begin to feel empowered to challenge existing entrapments such as routines and norms, and explore new ways of doing things. In developing solutions, they then undergo a cycle of conceptualisation, reflection, and action taking as a way of experimenting their ideas (Kolb, 1984). According to this view, HRD practitioners can create conditions for team building to help their employees embrace shared vision as a way of driving complex problem solving (Raelin, 2006). This will in turn encourage them to build their learning capabilities as they take more challenging actions.

5.2 Group taxonomy

Importance of team dynamics in action learning. Investing time with the group in understanding the overall process is essential for creating the right mindset for individual and collaborative inquiry. Action learning, although structured, provides opportunities for spontaneous involvement through self-directed learning and group learning where team members draw on the insights gained from self-reflection and present them as concepts for further dialogue and feedback (Yeo and Nation, 2010). As such, it is highly important that they embrace learning as a critical aspect of collective problem solving. Group dynamics developed through collaborative thinking and action taking can enhance the manner in which subsequent steps are to be taken. Errors or inconsistencies occurred in prior actions could provide opportunities for further learning as team members build on each other's mental models to see the big picture. Group dynamics help to integrate the stimulus-and-response triggers caused by complex problems to produce a 'rupture' (Leont'ev, 1981). Rupture happens when team members reach a breakthrough solution as they are forced to unlearn stubborn thinking patterns and embrace uncommon ideas. HRD practitioners can help their employees to build trust and mutual respect in order that they take greater risk in developing more powerful solutions (Louis and Sutton, 1991).

Importance of asking questions for increasing discretionary effort. When team members ask probing questions, they engage in each other's frames of references about the problem they are solving. It also creates synergy and energy in fostering collaborative inquiry. Probing questions are 'what if' questions that encourage team members to diagnose the problem through various scenarios. Also, deep questioning of assumptions helps them to develop their actions and prioritise their strategies for action taking (Torbert and Taylor, 2008). Asking appropriate questions increases team members' propensity to combine knowledge and experience, and contribute to the problem formulation based on discretionary effort. Such involvement also gives rise to learning and growth for the individual. HRD practitioners can therefore promote the use of questions as a way of developing teamwork in complex problem solving (Baird et al., 1997). Constant questioning of hidden issues also increases an employee's critical thinking skills.

Importance of time investment for increasing group engagement. Encouraging the team members to address how they plan to work together early helps them to discuss any diverging objectives and align their expectations. When they make sense of their role, identity, and contribution in the problem solving process as a group, they create the synergy necessary for achieving 'rupture' which in turn leads to breakthrough results (Leont'ev, 1981). Sufficient time should be given to the group to create common ground in a way that team members can objectively discuss challenging assumptions, commitment, accountability, flexibility, and support required to learn and take action successfully (Argote et al., 1995). Only then will they engage in the overall process to derive the best results possible. HRD practitioners can use communication as a channel to help their employees understand their level of influence based on existing social structures and their actions as part of complex problem solving (Swanson, 1995).

5.3 Action taxonomy

Importance of the right level of influence and authority. Team members must see the intrinsic purpose and value of action learning and this requires the right leadership. The problem sponsor and action learning coach should be sensitive to organisational politics and external pressures that often interfere with the learning process. Senior management should provide the support needed to allow the group to carry out their tasks efficiently and effectively through the right resources. The right level of influence and authority given to the group will provide the psychological safety for team members to better engage in learning and action taking despite unpredictable circumstances (Edmondson, 1999). With this 'freedom' to exercise initiative, team members can then learn to re-channel existing constraints into opportunities for creative actions and solutions (Donnenberg and De Loo, 2004). For HRD practitioners, the challenge is to encourage their employees to look beyond their existing conditions by creating opportunities for them to stretch their resourcefulness and innovation skills. Through appropriate support, employees can collectively think out of the box and determine the right course of action when confronted by complex problems (Kramer, 2008).

Importance of setting explicit timeline and expectations. Setting an explicit timeline is an important aspect of action learning as team members are better able to prioritise their tasks and resources needed to solve the problem. Setting common objectives and expectations at the start also helps to determine the level of contribution as a group. The

more explicit the timeline, the better is the spontaneity for team members to work with flexibility and constraints (Torbert and Taylor, 2008). Communicating the timeline, objectives, and expectations is just as important in ensuring successful action learning and problem solving. This will ensure that misinterpretation does not occur and that purposeful actions can be undertaken along the way. HRD practitioners can determine short, medium, and long-term learning objectives for their employees. Facilitating the understanding of common objectives and expectations is always a challenge. As part of an ongoing developmental process, HRD should include a strategic perspective where the types of learning required for each employee should be aligned to the needs of the organisation (Megginson et al., 1993). The success of any learning should be determined by specific outcomes that make a unique contribution to organisational effectiveness.

6 Conclusions

In this paper, action learning has been conceptualised as a complex problem solving approach with implications for HRD research and practice. This is supported by the theoretical roots of action learning as derived from the discipline of psychology which describes the cognitive and behavioural involvement of individuals in everyday activities. It is also concerned with the values individuals place on themselves, their social context, and the actions they can potentially take to make an influence on others and their context. This paper is built on the premise that the conception of knowledge as an active action (Gherardi, 1999; Nonaka and Takeuchi, 1995), as it integrates the cognitive and behavioural aspects of human involvement in exchanging mental models (metacognition) through problem solving and action learning. The conceptual relationship of this integration is underpinned by the perspective that action learning is both an individual and social process where the problem context, group dynamics, and power of action play a critical role in influencing the group's conceptualisation, reflection, experimentation, and experience. The underlying dynamics that support these elements are driven by organisational systems, structures, and cultures that provide the platform for developing HRD strategies (Van Looy et al., 2005).

The theoretical contribution of this paper extends to HRD as it explores the influence of complex problem solving as facilitated through action learning, for professional development. Based on the current literature, action learning is known to be a powerful tool in generating new ideas for practical implementation but not specifically contributing to HRD (e.g., Ng, 2008; Valentin, 2006; Yeo and Nation, 2010). This paper integrates the theoretical perspective of problem solving into action learning and then applies it to HRD, leading to a new perspective of cognitive and behavioural theory. This emerging perspective elevates the individual focus of HRD to consider how individual cognition and behaviour can impact organisational success and vice versa, adding a strategic dimension to HRD. Viewed from an organisational change perspective, HRD serves as a channel for individuals to develop knowledge and skills through problem solving and action learning as an inescapable way of life in their organisations (Senge, 1990). Problem solving as an integrative process helps to develop managerial thinking and reflective action taking, extending learning theories and practices. To advance HRD research, the relationship between metacognition, complex problem solving, and action learning can be further explored through empirical data.

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