TOWARD GROUP LEARNING AS *GROUP* LEARNING

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Abstract

A new framework for understanding group learning is proposed. The framework extends the currently held models of group and organizational learning by focusing on the essential differences between individuals and groups as information processing entities. The proposed framework appends two new dimensions to the existing theories of collective learning that are built around processes involving feedback seeking, error detection and correction, and routinization. The author argues that group learning occurs through the development and change in shared meanings held by the group members as a result of a continuous interaction with the actions performed, and the changes in the group's composition and structure brought about external constraints.

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More than ever before, organizations are using groups as the basic units of organizing work, across a wide range industries ranging from automobiles to space exploration. Therefore, it is not a surprise that group research has emerged as a distinct and vibrant stream of scholarly endeavor in organizational studies. A relatively new area of research focuses on the antecedents and consequences of group learning (Argote et al.2000).

A review of the work done on learning in organizations shows that researchers have predominantly built their approaches on individual learning processes. While the importance of this work is immense, there remains a need to look at group learning as a phenomenon that reflects the basic cognitive and structural differences between individuals and groups as information processing entities. It is my intent in this paper to develop a theoretical framework, which explains group learning by reflecting on the critical differences between groups and individuals as work units. In the following section, I summarize the extant approaches in organizational and group learning and their potential contributions to my proposed framework. I then, present the key assumptions underlying the proposed framework of group learning. In the sections thereon, I explain the framework in detail and explore its boundary conditions and implications.

1. INDIVIDUAL APPROACHES TO LEARNING IN ORGANIZATIONS

Research to date on collective learning has followed three somewhat distinct approaches. The first emanates from a well-developed stream of research in organizational learning (Argyris and Schon, 1978; Levitt and March, 1988, Argote, 1999, Crossan, Lane, and White, 1999). Common to this stream is the assumption that learning originates in the minds of individuals and manifests at the organizational level as changes in the theories of action (Argyris and Schon, 1978), routines (March and Simon, 1958), and the performance levels of employees (learning curves). Crossan, Lane, and White's (1999) *4-I* model of organizational learning charts out the trajectory of an idea from an individual, through his immediate work group, on to the organizational level in the form of four contiguous subprecesses – Intuition (at the individual level), Interpretation (at the individual and group level), Integration (at the group level), and Institutionalization (at the organizational level). Again, the starting point of this model is the individual and the emphasis of the model is on explaining the formation of organizational knowledge. The essential observation from this approach is that learning involves a process of error detection and correction that results in routinization and changes in cognitive maps and actions of individuals.A second approach is based on the work of the renowned educational philosopher John Dewey. Edmondson (1999) uses Dewey's (1922) views on human learning to conceptualize group learning as an ongoing process of reflection and action, characterized by asking questions, seeking feedback, experimenting, reflecting on results, and discussing errors or unexpected outcomes of errors. A third approach looks at group learning as a process involving activities by which individuals acquire, share, and combine knowledge (Argote et al. 2000). This approach assumes that learning has occurred if there is a change in knowledge as a result of group activities. However, it does not focus on whether the acquired knowledge is held within individuals or within the group as a unified entity.

In general, then, the work done on learning in organizations has looked at learning as a process of action, error detection and correction, followed by routinization. While acknowledging the diversity in these three approaches, there is nonetheless a common focus on learning as a phenomenon that is essentially unidimensional and occurs mainly within individuals, which is then manifested as a group or organizational level outcome. There remains a need to study group learning as a *group* construct.

2. LOOKING AT GROUP LEARNING AS A GROUP PHENOMENON

In this paper, I propose a fresh look at group learning that involves a continuous process of developing and altering shared meanings as the group executes its actions towards the attainment of its objectives. Furthermore, the development and alteration of shared meanings can not only occur as a result of feedback from the group's actions but also from the entry of new members or the exit of existing ones. My approach highlights the limitations of the use individual learning models as starting point of the traditional approaches to learning in organizations. I support this statement by articulating some basic differences between groups and individuals as information processing and acting entities. These differences can be summarized as,

2.1 Groups as distributed thought and action communities - A group is a distributed entity, that is, tasks, knowledge, and skills are distributed amongst members in a group. This reflects the concept of division of physical and mental labor in a group that works towards a common objective. Implicit in the common objectives is the need to integrate the diverse inputs of the group members in order to develop a well-orchestrated effort to attain the group objectives. Therefore, group learning would intrinsically involve two distinct but interrelated dimensions – learning how to work as a group and learning what needs to be done to attain the objectives. In contrast, an individual is the sole repository of knowledge and skills in a learning situation and consequently the only agency for performing and modifying all the actions related to the attainment of the task objectives. Therefore a group learning framework has to account for the processes that lead to the group members learning how to pool their inputs together and integrate the diversity in their knowledge and skill domains. The key phenomenological distinction between individual and group learning is the process by which a group evolves a shared understanding of how it needs to attain its objectives and integrate the activities of the group members.

2.2 Group Knowledge v/s individual knowledge – Research on organizational and group learning, takes a view where in individuals in a group or a larger collective setting bring in their diverse knowledge bases and share them to form a combined knowledge base. Research on socially shared cognition shows that this combined knowledge is created through the dialogical exchange of thoughts and ideas amongst the group members. In other words, the concept of group knowledge is not just a mere additive representation of the individual members' knowledge bases but rather a distinct entity that emerges out of the social interactions of the group members. This group knowledge manifests itself in the socially constructed and mutually shared meanings of who each member of the group is, what each member knows and is capable of doing, what the problem situation is, and what the group as a whole and each member in it need to do to respond to the problem situation (Weick and Roberts, 1993). It is evident from this premise that using an individual learning

model for explaining the generation and change in knowledge at the group level may be inappropriate.

2.3 Sources of error and conflict – As I have discussed before, the learning process has been thought of as one that involves reflection and action, feedback-seeking, error detection and error correction. At an individual level, the sources of error can be a) within the individual – his/her own limitations, or b) in the task environment over which the individual might not have any control. On the other hand, a group may have various sources of error. These may range from a divergence in shared meanings amongst the existing group members (Weick and Roberts, 1993) to the errors brought about by changes in composition in the group during its tenure. New group members might bring in new knowledge and perspectives that may not be aligned with the prevalent shared meanings in the group. Or existing members might leave the group, which might not only result in changes in the group's knowledge and skill inventories but also errors in coordination of actions of the remaining group members. This is significant point of departure form the individual learning models.

Given these key differences in the underlying assumptions between individual and group learning mechanisms, I will provide a basic outline of a group learning framework that incorporates these features. To do so, the framework must account for the following: -

1) The constitution of the "group mind" and its supraindividual characteristics.
2) The development and subsequent changes in the shared meanings as a group executes its tasks towards the attainment of its objectives.
3) The distinct sources of error and conflict that may lead to discrepancies in a group but need not occur in an individual learning situation.
4) The characteristics of learning processes that are applicable at any level such as reflection-action, error detection and correction, and routinization.

The figure below depicts a scheme of what such a learning framework is likely to visualized as. In the next section, I will explain the underlying concepts within each element of this framework.

Insert figure –1 - Proposed Group learning framework

The group learning framework presented here comprises three domains - Meanings, Actions and External domains. It incorporates a continuous interaction between the shared meanings of group members, the actions that they take based on those shared meanings, and constraints imposed by the external environment such as entry of new members and exit of existing ones and performance objectives laid out by the larger social structure in which the focal group is embedded. The framework presented here is an iterative process, which at one level corresponds to the basic underlying mechanism of sensemaking – Action – Meanings –Action (Weick, 1979).

3. MEANING DOMAIN

The sensemaking perspective can be summarized into a basic proposition that we see what we believe rather than we believe what we see. And what we see in turn affects

what we believe. The "what we believe" aspect of this proposition has been categorized as cognitive schemas or mental models. Schemas can been defined as built-up repertoires of tacit knowledge that are used to impart structure upon and impart meaning to, otherwise ambiguous social and situational information to facilitate understanding (Gioia and Poole, 1984). Langfield-Smith (1992) posits that as a group comes together, some aspects of the individuals' cognitive schemas will overlap and some will not. A shared cognitive schema emerges from a social interaction process marked characterized by negotiation and argument. Levine et al. (1993) identified various modes in which shared meanings or mental models might develop in a group. Group members will engage in verbal interactions wherein they exchange (share) their thoughts and ideas with each other. Alternatively, individual group members may seek help from others to interpret a given situation. In both the cases, the development of shared meaning in a group requires a dialectical interaction between the group members.

The development of shared cognitive meanings is the central underpinning of group functioning. Researchers have used various terms to identify shared meanings in groups, such as, Team Mental Models (Klimoski and Mohammed, 1994), Intersubjective meanings (Ickes and Gonzales, 1991), Shared Meanings (Daft and Weick, 1984) etc. Peter Senge (1990) calls this necessary condition as "alignment" where in the group thinks and works as a single unit. Senge (pp. 235, 1990) quotes a phrase widely used in Jazz, "being in the groove", that suggests a state when an ensemble, "plays as one." As a group develops, its members develop shared meanings through interactions and these meanings in turn are changed continuously as the group receives external feedback from its actions. In a study of two railroad companies (Barr et al, 1992), the researchers traced the evolution of cognitive maps of the top managers of two Mid-western railroad companies, the C&NW and the Rock Island. Only one of the two companies – C&NW survived and the other went under. Although changes in the cognitive maps of top managers were evident in both the companies and were linked to changes in the external environment, the authors attributed the success of C&NW to a process of continuous experimentation and learning in the cognitive maps of the top managers. The development and subsequent change in shared cognitive meanings can be seen as a process of unfreezing – moving- and refreezing (Isabella, 1990) and it constitutes a change in what the group knows about interrelationships of tasks, knowledge and skill domains of the group members, and the problem situation. A group can develop shared meanings on the behavioral interrelationships of the group members, the specific knowledge and expertise held by each individual, and the framing of the problem situation.

3.1 Shared Interrelationships - Weick and Roberts (1993) proposed the concept of heedful interrelationships as the defining feature of the "collective" mind. Heedful interrelationship occurs when actors in a group construct their actions relative to their understanding of how those actions will be related to others, and how the interrelationships between the actions will be embedded in the overall functioning of the group. The level of convergence or divergence in the interrelating will determine the quality of the coordination of the group member's activities. A group by nature is a unified collection of individuals whose tasks are interdependent on one another. Interdependence of tasks requires the individual group members to develop a larger view of how their tasks and related behaviors will be linked to those of the others and how the overall linkages will determine the outcome of the entire group.

3.2 Group Transactive Memory - Another outcome of task interdependence is cognitive interdependence. This involves the distribution of information processing domains amongst the members of the groups based on their background knowledge and expertise. Cognitive interdependence is focuses around memory processes in groups (Wegner, 1987). Wegner posited that people in close relationships develop a transactive memory system, which involves a differentiated responsibility of remembering different portions of common experience. Such a system combines the knowledge possessed by individual group members with a shared awareness of who knows what (Moreland et al., 1996). Furthermore, members develop expectations about the expertise domains of group members and assume that others will take responsibility for remembering information falling in their area of expertise.

There is strong empirical evidence that transactive memory systems develop in groups and that these systems enhance group performance. In an experiment seeking to understand the relationship between the group training and group performance (Liang, Moreland, Argote, 1995), the researchers found that groups in which the members were trained together performed significantly better that those groups in which the group members had been trained separately. The researchers concluded that the groups on which the members had been trained together were able to develop transactive memory systems through which they were able to a) recall different aspects of the procedure, b) coordinate their activities, and c) trust one another's expertise. The researchers found that transactive memory mediates the effects of group training on group performance.

3.3 Shared problem framing - Along with heedful interrelationships of action and behavior, and a shared awareness of the knowledge possessed by each group member, shared meanings involve the framing of the problem situation, which is consensually accepted by the group. The development of shared frames helps to delimit and define the complex task environment facing the group. The framing process involves a dialogical interaction between the group members and develops into a shared definition of the problem situation. The problem situation frame includes a comprehension of what the group objectives are and what the group needs to do in order to attain those objectives.

In summary, for a group to perform effectively it is essential to develop a consensual framework of meanings that are held jointly by each group member. It is only by developing these consensual frameworks that a group can integrate the diverse competencies and viewpoints of its members. As group members carry out their tasks, they obtain feedback from the environment. Their actions generate reactions, which may force them to reevaluate and renegotiate their shared meanings. This process of reevaluating and renegotiating shared meanings is a new dimension proposed in the group learning framework developed here.

4. ACTION DOMAIN

Tasks performed by the group members generate feedback form the external environment. This feedback when compared with the group's expectations about the objectives helps detect errors. Errors can occur when group members diverge in their perceptions of interrelationships (Weick and Roberts, 1993). Similarly a lack of shared

framing of the problem situation might lead to individual group members working at cross purposes and not being fully committed to the group objectives.

As a group performs its tasks, knowledge in a group gets embedded in its structure and standard operating procedures. (Argote at al. 1999). These authors argue that the knowledge acquired by the group through task performance gets embedded in supraindividual routines. In an experiment (Epple et al., 1996) designed to compare the extent to which knowledge gets embedded in the organization versus in individual employees, researchers studied a manufacturing plant where a second work shift was added almost 2 years after the first shift had been in operation. The new shift was staffed by new workers who had no prior experience in the tasks. The researchers found that the new shift to just two weeks to attain the productivity levels that the preexisting shift had taken two months achieve. They concluded that the knowledge gained during the operation of one shift got embedded in the organization's structure and technology and since the new shift used the same structure and technology, it significantly reduced the learning time to attain the same productivity levels.

4.1 Group Technology - Shared meanings about the task interrelationships, the specific problem situation, and individual competencies also results in a group level representation of the nature and demand of tools and technology that needs to be employed to attain the objectives (Klimoski and Mohammed, 1994). In a situation where a group is made to adapt new tools and technologies by external constraints, the resultant dialectical processes that lead to a renewed unfreezing-moving-refreezing of shared meanings held by the group members. Therefore, changes in tools and technology can be either the outcomes or the triggers of a group's learning process.

4.2 Structure - A group's emergent structure is characterized by the norms that guide consequent behavior and interactions amongst the group members. The relationship between a group's emergent shared meanings and its structure has been encapsulated in Giddens's (1984) structuration theory. Structure emerges out of the dialectical interactions that characterize the relationships between social entities. According to structuration theory, "structure" can be conceptualized as normative elements of a social setting. According to Giddens, a routine is an activity that is done habitually and forms the basic element of a social structure. The interactions and behaviors of group members that enable the formation of shared cognitive meanings also get manifested explicitly in the form of group norms and routines that constitute the social structure of the focal group. The changes in group norms may reflect a group exhibiting a learning process wherein the group members detect errors and change their shared understanding about the ways in which they coordinate their actions and interact with each other.

5. EXTERNAL DOMAIN

Unlike the assumptions in the individual learning models, the group learning framework proposed in this paper has extraneous sources of error, which may not be not related to the group's actions. These sources emanate from the entry of new group members or the exit of the existing ones, and, the constraints posed by the social setting (in our case, organizations) in which the group is embedded.

5.1 Entry of new members and exit of existing ones - New members might come in with divergent cognitive structures and in order to align their inputs with the existing members, they need to be actively socialized into the group. Similarly, the exit of existing members might leave gaps in the knowledge and expertise repository of the group, which in turn will require a renegotiation of responsibilities and tasks. In both the cases, the group is faced with new conflicts of divergent schemas of the new individuals or the loss of individuals who were repositories of specific knowledge and skills. In each case there will be an unfreezing of the shared meanings and after a process of renewed dialogical interaction and influence, new shared meanings will emerge. The point to be noted here is that that group learning may continue to occur due to the entry of new group members or the exit of existing ones. That is, group learning is not just limited to action-reflection followed by error detection and correction.

5.2 Organizational constraints - The larger social settings in which the focal group is embedded may establish performance objectives and impose resource constraints on it. These constraints will force the group to compare the outcomes of its actions with those that are expected by the external constituents and strive continuously towards maximizing its performance. Thus the external organization indirectly induces the group members to continuously reflect upon their interrelationships and actions. Furthermore, knowledge and information obtained from sources external to the group may require a group to reassess its approach towards the attainment of its objectives. The process of reflection and reassessment, and bringing about corresponding changes in the tasks, technology, structure constitutes group learning.

6. IMPLICATIONS

6.1 Theoretical Implications - The proposed group learning framework provides some viable indicators by which learning in groups can be operationalized and measured. Two distinct indicators are proposed in this paper:

- Changes in the shared cognitive schemas of the group members.
- Changes in the tasks and technology and structural norms of a group that emerge as a result of the feedback that the group receives as a result of its actions.

The framework also indicates the situation in which learning may be hindered or not occur at all. According to Levine et al. (1993), overreliance on shared understanding and intersubjectivity might inhibit the group from utilizing the cognitive resources of the group members. An extreme example of this phenomenon is "groupthink", which is defined as extreme concurrence-seeking that produces group decision making (Janis, 1982). Additionally, the existence of a dominant view point in a group might hinder the detection of errors, as the group might be induced to attribute the causality of the errors to sources in the external environment.

6.2 Practical Implications - The effect of group composition on group learning highlights the importance of the care that is necessary in handling group members. As much as possible, group membership should be kept intact. As a group grows in experience, it is able achieve a higher level of shared understanding on task and behavioral

interrelationships, awareness of who knows what, and the overall problem situation facing the group. Higher levels of shared understanding will improve group performance and reduce errors. However, managers must ensure that a group should not become so cohesive that it develops the hypothetical "one right way", which will hinder the development of new ideas that can challenge the existing procedures. The proposed framework also indicates that where possible, efforts should be made to train group members together. This will enable them do develop a viable transactive memory system (a shared awareness of who is good at what), which in turn can significantly improve the group's performance.

7. CONCLUSION

The group learning framework presented in this paper proposes a new look at the ways in which learning can occur in groups. I have highlighted the limitations of individual learning models in capturing the entire rubric of collective learning processes. The core thesis of the proposed framework is that group learning occurs through the development and change in shared meanings held by the group members as a result of a continuous interaction with the actions performed and the changes in the group's composition and structure brought about external constraints. Furthermore, the proposed framework indicates that group learning can occur in two distinct modes – action-reflection followed by error detection and correction, and, the renegotiation of new shared meanings due to the constraints posed by the external environment. These constraints take the form of the entry of new members and the exit of the existing ones, and changes brought about by new technologies and knowledge in the external environment.

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Figure –1 - Proposed Group Learning Framework

Meaning Domain

Shared interrelationships

Conflict with existing meanings
Unfreeze <-move> Refreeze

Shared framing of the problem situation

Group Transactive Memory

External Domain

Entry of new and exit of existing members

Organizational Constraints and Performance objectives

Action – Tasks performed by group members

Error
Detection <> Correction

Technology

Structure
- Noms
- Routinization

Action Domain