



Organizational learning and implications for technical cooperation projects



RESEARCH AND STATISTICS BRANCH
WORKING PAPER 11/2008

Organizational learning and implications for technical cooperation projects

Nobuya Haraguchi
Research and Statistics Branch
UNIDO



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna, 2009

The designations employed, descriptions and classifications of countries, and the presentation of the material in this report do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. The views expressed in this paper do not necessarily reflect the views of the Secretariat of the UNIDO. The responsibility for opinions expressed rests solely with the authors, and publication does not constitute an endorsement by UNIDO. Although great care has been taken to maintain the accuracy of information herein, neither UNIDO nor its member States assume any responsibility for consequences which may arise from the use of the material. Terms such as “developed”, “industrialized” and “developing” are intended for statistical convenience and do not necessarily express a judgment. Any indication of, or reference to, a country, institution or other legal entity does not constitute an endorsement. Information contained herein may be freely quoted or reprinted but acknowledgement is requested. This report has not been formally edited.

Acknowledgements

Maria Fermie was responsible for stylistic revision and Griselda Sanz for graphic design.

Table of Contents

Introduction.....	1
Theories of organizational learning	1
Individual learning	2
Organizational learning.....	3
Conflict studies	5
Utilitarian tradition.....	6
Macro-structural view.....	9
Micro-structural view.....	10
Summary of organizational learning theories.....	13
Type I learning.....	14
Type II learning.....	17
Policy implications for technical cooperation.....	19
Final remarks	25
References.....	26

Introduction

This paper reviews theoretical and empirical literature on organizational learning in order to gain deeper insight into the subject for future empirical work at the Research and Statistics Branch of UNIDO. The first part of this paper introduces the current thinking on organizational learning, paying particular attention to how various disciplines contribute to understanding the subject. The second part draws on policy implications from literature review and sheds light on how the implications can deter the quality of technical cooperation (TC) projects, especially those that entail organizational and individual learning, such as capacity building projects. Finally, the paper presents a summary of the discussion.

Theories of organizational learning

Organizational learning has developed dynamically during the past three decades. The influxes of various disciplines into the field and progressive contributions from those disciplines have deepened our understanding of organizational learning. However, owing to this rapid evolution, to date, no agreement has been reached on the definition of organizational learning (Antal, Dierkes, Child and Nonaka, 2001). This paper, likewise, does not provide a definition for organizational learning, but draws its contour by first focusing on individual learning as a basis for organizational learning, and then looks into the salient characteristics of organizational learning, which cannot be explained simply by aggregating individual learning.

Individual learning

From the psychological perspective, learning, in general, can be considered to be ‘a process by which relatively permanent changes occur in the behavioural potential as a result of experience’ (Maier, Prange and Rosenstiel, 2001). First, this indicates that in order to refer to a process as learning, knowledge acquired through the process stays with an individual. This information can be recalled at will for an extended period of time. Forgetfulness occurs unintentionally as our memory has limited capacity and loses knowledge, especially knowledge that is relatively infrequently recalled. Forgetfulness also occurs intentionally, when replacing obsolete knowledge with new knowledge. However, information, which merely attracts one’s attention without being stored in one’s memory, is not considered learning. Secondly, learning can be initiated through experience. Thus, the acquisition of a skill, due to the natural course of biological development, as in the case of a baby that starts walking because of maturation, cannot be termed as learning. Finally, learning influences the behavioural potential of a person only because learned knowledge is not necessarily translated into behavioural change all the time. For example, only part of the knowledge acquired through education is reflected in one’s behavioural pattern. Some of the learned knowledge does not have any impact on behaviour because one does not make full use of the learned knowledge in day-to-day lives. For example, memorizing an emergency telephone number does not change one’s behaviour until a situation arises which requires one to recall the number. Even though one acquires knowledge that is useful through the learning process, this knowledge might still not be reflected in behavioural change, due to lack of motivation or constraints, such as lack of resources. Thus, learning is not directly linked to improvement in performance, which occurs only in applicable situations.

The above discussion describes the essential characteristics of learning to the extent that it is a neutral, rational process to be carried out only to maximize one’s utilities. However, contributions from psychological discipline suggest that learning can be biased and can also affect one’s performance in a negative way. Past experiences and accumulated knowledge affect what one learns in the future and how external stimuli, such as

information and experiences, are interpreted in the learning process. The desire to acquire or search for new information in areas related to our daily lives, interests and accumulated knowledge are all associated with past experiences. Hence learning behaviour is path dependent and changes very gradually. Similarly, the way information is interpreted in the cognitive process is influenced by experiences, which leads one to form perceptions about various matters. Perceptions in turn help one to quickly interpret incoming new stimuli with limited information about it by focusing on familiar characteristics of the stimuli in light of one's existing perceptions. For example, if one perceives a person of a certain nationality as industrious, one is likely to generalize this perception to all with that nationality, and is referred to as a stereotype. Now if a stereotype is involved in decision-making, this can have repercussions as it risks sacrificing performance, for example, hiring a person based on nationality and not on merit. This is a typical case of the negative effects that learning could have on our lives. Insights from psychological discipline illuminate the cognitive process of individual learning and its relationship with behaviour. Individual learning therefore constitutes a basis for group learning. If this is the case, can it be assumed that group learning is simply a proportional extension of individual learning, considering it a similar process only with a larger number of brains involved?

Organizational learning

As individuals in a group learn, a group definitely stores more information than an individual. However, such storage of information can be disproportionate as each member of the group can choose to specialize in certain learning activities. This specialization effect can be enhanced through better harmonization and coordination. If individuals are aware of each others' specialization, information relevant to a specific person can be shared by the group. Furthermore, information stored in different individuals can be better retrieved through cues provided by the group members. Thus, group learning can be superior to individual learning not only because of its disproportionate enhanced storage capacity through division of labour, but also because it is a more efficient way of retrieving information. Besides, the higher learning capability

of group learning is not only limited to the quantitative improvements in storing and retrieving information of group learning, but also to the quality of information that can be enhanced through cooperation among group members, with regard to correction, compilation and collation of information (Maier, Prange and Rosenstiel, 2001).

The potential advantages of group learning over individual learning, however, sometimes cannot be realized in real work group situations due to coordination problems and differences in the abilities of group members. A group may not be able to make optimal use of information stored in the minds of individuals because of the lack of cooperation between members and unequal communication abilities of and opportunities for group members. Therefore, a group may reach a biased and suboptimal decision by taking account of the information from certain individuals more than others. If the information used in the decision-making process is biased, the amount of information (gathered and retrieved by a group exceeds that of an individual) could become an irrelevant factor with respect to the quality of the decisions taken. This could in fact lead to an even worse decision taken by a group as against that taken by an individual.

An organization can be considered to be an extension of a group, but it is often distinguished from the latter, in terms of its planned, coordinated and purposeful actions of members, who are arranged and regulated by formal and informal institutions. Organizations can, for example, store knowledge in the form of established rules and routines as well as in individuals. Therefore, some of organizational memories could remain within institutions of organizations even though its members change. There is empirical evidence that the productivity of a highly formalized production process was not affected by turnover among its production workers (Argote, Beckman and Epple, 1990). This resulted from the fact that information on firm-specific production was stored in the routines of the production process, which could be operated by generic skills of workers available in the labour market.

The above discussion evolved from individual learning to group learning and further to organizational learning. Individual learning, with a focus on the cognitive process,

constitutes a basis of learning. But the formation of a group with more than two individuals can change some of the characteristics of learning as the dimensions of specialization, communication and cooperation are added to the learning process as possible promoting and constraining factors. Moving from group to organizational learning, the introduction of greater formality in decision-making, planning and interaction among individuals demands a closer look at institutional factors to understand organizational learning.

At a higher level of aggregation and formality insights from psychological discipline, focusing on the cognitive process of individuals has limited usefulness for understanding the learning process. Although the cognitive process and its relationship with behaviour are also applicable to individuals in the setting of an organization, in the study of organizational learning, the learning process goes beyond individuals. Organization-wide learning and performance improvement are of main interest for this study. Thus, analyses need to be extended to include, for example, how the institutional environment influences the performance of an organization as a whole, and how individual knowledge within an organization can be shared and stored as institutional memories to improve organization-wide performance. At the organizational level of learning, it is apparent that contributions from wider disciplinary fields have to be sought. This includes sociological, economics and management studies.

Conflict studies

While the focus of psychological discipline is on the cognitive process of individuals, that of sociological discipline is on the relationship between individuals. There are different schools of thought with regard to how relationships are formed, shaped and evolve within an organization. One such major thought comes from conflict studies (Gherardi and Nicolini, 2001). This tradition examines where power is located in an organization, when it is used, how it is exercised in the mobilization and allocation of resources, transmission of ideologies, and management of organizational members. Attention to power helps one to understand who determines the learning agenda and course of action for learning, as

well as why certain groups of people have access to learning opportunities, while others do not.

In business organizations, the hierarchical structure usually reflects formal power relationships among members. However, in reality, power can originate from sources other than formal positions in a hierarchical structure. Knowledge, personal relationships and informal networks can become potential sources of power. For example, a high degree of technical complexity may inhibit proper scrutiny and evaluation by the dominant group (such as management), thus allowing individuals with knowledge greater freedom and influence (LaPalombara, 2001).

In the political sphere, levels of complexity and conflict overvalues could make it impossible for political parties to achieve their goals, no matter how much learning occurs. Even in business organizations, abuses of power could lead an organization to undertake wrong kinds of learning or fail to make use of knowledge acquired through learning.

Utilitarian tradition

While conflict studies focus on power, as the explanatory factor for interaction with people, utilitarian tradition in sociology and social science, in general, focus on socialization from the perspective of rational motivation of people. In sociology, utilitarianism conceives society as comprising individuals pursuing their own interests and rejects the existence of a superstructure. Thus, exchanges between individuals are explained by the self-interest of individuals seeking rewards intrinsic to the interaction. Individuals receive feedback through exchanges with others and reinforce the beneficial patterns of exchanges, such as those that provide social approval and better access to information. Through such continuous feedback from interactions, it is further argued that within an organization individuals adapt their exchange behaviour and start forming cohesive groups and developing a shared culture and normative system.

This tradition finds a counterpart in orthodox microeconomics, which sees the exchange of economic actors as rational, profit-maximizing and impersonal (Boener, Macher and Teece, 2001). The recurrence of exchange among actors generates an equilibrium condition, which seems to correspond with the adaptation and formation of a normative system in utilitarian tradition of sociology. In this highly simplified world of microeconomics, there is actually no need for learning, as individuals are expected to act rationally based on their preferences. Technology, for example, is largely treated as a set of blueprints and is transferred freely. Within this framework, the strategies of both technology suppliers and recipients and the capabilities and learning behaviour of recipients are totally irrelevant to the transfer and accumulation of technologies, and hence the technological level of economic agents is automatically adjusted. Thus, the orthodoxy presupposes an extremely high degree of flexibility in the economic system and does not pose any structural constraint on technology transfer (Andersen, 1992:75).

In terms of learning, the utilitarian and rational view of individual behaviour suggests that one rationally responds to external stimulus and acquires knowledge without much hindrance, which is deemed necessary for one's correct response to the stimulus. The implication of the views to organizational learning is that, in order for rational individuals to adopt correct learning behaviour, they need to know what successful and unsuccessful behaviour is and should also have ready access to knowledge that can be acquired to adopt successful behaviour. Thus, under these assumptions, the policies that an organization can take should involve open communication of experiences and facilitate knowledge flow among members. Organizations should also clearly state what successful behaviour involves and align the incentive system to induce such behaviour. Successful behaviour inside and outside the organization can be analyzed and benchmarked for members to emulate. Knowledge and skills possessed by successful individuals should be codified to the extent possible, or embedded in the production system and routines of the organization.

While the tradition of conflict studies in sociology sheds light on how learning opportunities and constraints are determined and distributed within an organization based

on the concept of power, the utilitarian tradition suggests how individuals behave under an existing power structure of an organization. These characteristics of organizational learning suffice to describe the general framework of learning conditions in an organization and learning responses of individuals to incentives offered through the framework. However, the views of these traditions do not explain how individuals and organizations actually learn. This central issue of learning is treated as a black box. Essentially, conflict studies illustrate the shape of the box, and individuals going into the box are expected to automatically acquire the necessary knowledge in response to the stimuli they receive.

The first problem with this concept of learning is that it does not take into account the context-specific factors which promote and/or hinder the learning of individuals. The assumptions of the utilitarian school and theoretical posture of orthodox economics that individuals are rational and highly responsive to stimulus is an oversimplified picture of the learning process. As pointed out in the discussion of the contributions from psychological discipline, there is a path dependency in the cognitive process of individuals due to their accumulated experience. Thus, different individuals could perceive a stimulus in an organization differently, and accordingly their responses to it could vary. Furthermore, besides the recognition of power as a factor influencing organizational learning, the two schools in sociology do not provide much insight into how an institution, a factor unique to organizational learning, affects collective learning. Another unexplained aspect of the preceding views is the learning of an organization as a whole. The views focus mainly on how decisions related to learning—who, what and how to learn—might be taken and how individuals within an organization might respond to decisions but provide little information on how the organization itself might respond to external stimuli and change. For these deficiencies, one needs to resort to other schools of thought in sociology.

In this respect, macro- and micro-structural views of socialization in the Durkheimian tradition provide useful insights. Durkheim's work (Gherardi and Nicolini, 2001) focused on norms, institutions, relationships and interactions that structure the behaviour of

subjects, individuals and organizations, rather than subjects themselves. So in this tradition, organizational learning is treated as a dependent variable explained by the environment (Gherardi and Nicolini, 2001). The macro-structural view studies the impact of the social environment on an organization as a whole, while the micro-structural view examines how the social environment within an organization affects the behaviour of its individuals.

Macro-structural view

The macro-structural view rejects the rational behaviour of an organization. Unlike the utilitarian tradition, the macro-structural view asserts that organizational response to environmental changes is tightly bound. Different organizations may vary in their response to the same change in environment due to differences in their abilities to receive, process, interpret and act on the information. Often organizations, especially small ones, do not have a formal system to scan environmental changes and have to rely on the perceptions of certain individuals to detect changes. Such informal information-gathering is likely to put constraints on an organization's ability to fully, impartially and correctly receive information. Even organizations with a formal monitoring system may not be so receptive if external changes do not thematically overlap their corporate culture (Rosenstiel and Koch, 2001). Organizations, whose cultures are not open to diverse values in a post-modernist society, may not realize the diversity in socio-economic values and could continue to maintain an incentive structure catered to only one (for example, monetary) of many diverse values of society. This mismatch between the environment and organizational routines embedded in the culture risks compromising the organization's performance.

The above discussion illustrated the problems associated with an organization's inability to receive and process information. However, overcoming these inability still does not rid an organization of problems arising from response to external changes. Fransman (1998) argues that an organization's vision can hinder the interpretation of

information and hence endanger a suboptimal behaviour, regardless of how much and how well the organization receives and processes information.

The case of the IBM paradox, presented by Fransman (1998), illustrates this well. During the 1980s, the ability of computer giant, IBM, to acquire and process relevant information was probably greater than any other firm in the field. Although at that time IBM possessed information regarding the increasing cost-performance ratio of microprocessors and substitutability of smaller computers and mainframes, it still considered mainframe business to be the focal point of the firm's efforts because of: its spectacular success with the mainframe; the failure of the future systems project in the mid-1970s; and the fear that new technologies might undermine the firm's 'cash cow' mainframe business. This led IBM to maintain operation of the mainframe for an extended period of time, and thus delayed its serious commitment to smaller computers. It is clear there was a disjuncture between the information the firm possessed and its knowledge-belief. The problem was not the quantity of information relative to the firm's ability to acquire and process information, but failure to promote smaller computers early. This was attributed to IBM's vision at that time which was based on past experiences. The contribution of Fransman, through the analysis of the IBM case, concludes that the behaviour of a firm is determined not only by the quantity of information, with regard to external changes and ability to process it, but also the firm's vision which allows room for insight, creativity and misconception.

Micro-structural view

Like learning at the level of organization, the micro-structural view suggests that the learning of individuals is conditioned by the characteristics of an organization and is therefore context-specific, contrary to the views of the utilitarian tradition. The effect of power on learning, as indicated in the conflict studies, is just one of many factors affecting individual learning. Existing routines of organizations narrows down the scope of learning activities as routines pre-select goals, types and ways of learning that an organization desires. Knowledge derived from this particular learning process could be a

base upon which new learning activities are built. Therefore, the effect of path dependency discussed in individual cognitive process also applies to learning at organizational level. The authority and existing routines direct individuals to certain learning activities. But what are the factors that determine the effectiveness and efficiency of organizational learning?

If learning is interactive, then the kind of relationships that exist in an organization should be a key to the quality of organizational learning. These are relationships between management and subordinates, the mutual adjustment of actions taken by subordinates, and relationships between subordinates and the process of physical production in which they are engaged (Gjerding, 1992). The work organization reflected in these relationships will be more conducive to learning if it can better solve the diversity-formalization dilemma inherent in the process of organizational learning. Diversity of work organization is important, especially at the early stage of a problem-solving activity when the need for gathering and processing new information is high. Higher levels of diversity are likely to increase the sources of information, methods of processing information and ways of interpreting processed information. Thus, the quality of a solution that the organization finds to a problem tends to be positively correlated to the degree of organizational diversification. As the firm moves from the initiation stage to the implementation stage, a clear and strict line of authority and responsibility reduces confusion among the employees and helps to routinize the new activity and increase production efficiency.

Organizational integration is a key to better accommodating the diversity-formalization dilemma (Gjerding, 1992, Lazonick and West, 1998). Lazonick and West (1998:249) define organizational integration as “a set of ongoing relationships that socializes participants in a complex division of labour to apply their skills and efforts to the achievement of common goals”. An organizationally-integrated firm is likely to enjoy higher participation of employees. The active participation of employees from different ranks and departments in the organization increases sources of information and facilitates communication. Similarly, organizational integration helps the firm at the

implementation stage to build a consensus among the employees and to flexibly and rapidly respond to local emergencies through the versatility of workers on the shop-floor. Here organizational integration does not create the formalization and centralization considered necessary for effective implementation, but the lower economies of specialization are compensated by higher economies of multi-functionality (Gjerding, 1992:106). A firm with a high degree of organizational integration, therefore, has a better chance of overcoming the diversity-formalization dilemma if dynamism in work organization is established.

This positive association between the integration of workers and the level of organizational learning supports the view of the micro-interactionist tradition on learning, asserting that learning has to do with participating and is hence inseparable from practice. This perspective on learning as a social and cultural process provides important insights unique to organizational learning as opposed to individual learning. The notion of communities of practice originating from the micro-interactionist tradition views learning not so much as a process of knowledge acquisition by individuals but more a process of social participation. Lave and Wenger (1991) defined a community of practice as a joint enterprise, as understood and continually renegotiated by its members, which binds members into a social entity and allows them to share in the communal resources (routines, sensibilities, artifacts, vocabulary, styles, etc.) that its members have developed over time. According to their path-breaking analysis, the so-called situated learning theory, learning is specific to a local situation, whose context interprets and gives meaning to knowledge through culture, routines and language. Therefore, it is argued that internalization of knowledge through the cognitive process is incomplete, if not useless, especially for organizational learning if the process is not accompanied with learning within the context as a whole in which knowledge is used because knowledge is never considered neutral and objective in theory. In this sense, participation and practice become an important part of learning.

Moving from peripheral participation to full participation, a learner acquires knowledge and becomes familiar with the culture, personal relationships and routines of local

situations. This familiarity with the surrounding environment and contexts allows one to make effective use of the acquired knowledge (Lave and Wenger, 1991). The situated learning theory, therefore, confirms the importance of organizational integration for learning. However, theory views integration not only as closer cooperation among members of an organization, but also fuller participation in and familiarization with the contexts of knowledge acquisition by its members. The situated learning theory provides insight into how knowledge, participation and learning are linked to each other in local practice as well as in the culture of that practice (Gherardi and Nicolini, 2001). This helps one to understand especially the process of mastering the already practiced knowledge in a local situation by newcomers. However, this theoretical model may not be sufficient to explain organizational learning for developing new knowledge or adapting to a new environment although, as discussed above, organizational integration is conducive to even these types of learning.

Summary of organizational learning theories

This section summarizes the organizational learning theories reviewed above using types of organizational learning frequently found in literature, with a modification by the author (Maier, Prange, and Rosenstiel, 2001; Gherardi and Nicolini, 2001; Pawlowsky, 2001). As studied by Pawlowsky (2001) different authors distinguished at least two types of organizational learning. Bateson's type I learning, or the single-loop learning of Argyris and Schon, refers to the process of error detection, corrections and efficiency improvements within existing operational routines. Bateson's type II learning, which corresponds to double-loop learning of Argyris and Schon, involves organizational adaptation to a new environment. When an organization faces a change in its environment, it may require more than upgrading and continuous improvements within existing operational procedures in order to cope with the change. In this case, learning entails at least the review and evaluation of current operational procedures and structures to see whether they are suitable in a new environment. If necessary, an organization's routines, including strategies, procedures and structures, would need to be altered in accordance with the new environment. Both Bateson and Argyris and Schon assign their

type III learning to the process of adopting new ways of learning, in other words, learning to learn. However, seeking new learning methods could occur within both types I and II of learning in pursuit of respective objectives. Therefore, without having a separate category for this type of learning, it can be embedded in the first two types, even though the scope of the methodological changes, if necessary, would be much smaller in type I learning.

If another type of learning is to be added to the above, it may be referred to as a learning process that has overarching effects on the first two types of learning, just as the second type has on the first one. This type III learning could include a process of adopting a new organizational culture, which could become the basis of fundamental changes in the behaviour of organizational members—ways to communicate, work and relate with each other, albeit with implications on their cooperation, coordination and risk-taking behaviour. Besides, a change in organizational culture can take a relatively long time and usually requires an initiative and commitment by the top management or the replacement of it. There are times when the adoption of new routines (for example, strategies and operational procedures), type II learning, will not effectively bring about the intended results if the underlying organizational culture and the concomitant behaviour of organizational members do not change. In this regard, cultural change can be considered the most fundamental aspect of learning by organizations necessary for continuous growth amid a changing environment.

Type I learning

Type I learning occurs during the consolidation, refinement and continuous improvement of existing operations. Since the dominant operational procedures are being, or have already been, established, understanding why they work is not the major issue for learning. Here, learning is more concerned with how to improve these procedures. In this type of learning, behavioural learning becomes relatively more important than cognitive learning (Starbuck and Hedberg, 2001). One does not necessarily need to understand why one way is better than another, but based on experience, one is generally inclined to adopt

a type of behaviour which produces better results. In such a case, learning-by-doing to accumulate experience, and learning-by-using to learn from feedbacks from users are the main sources of learning (Rosenberg, 1976).

In addition to these sources, interaction with equipment suppliers could also contribute to improvements in production efficiency. Malerba (1992) studied links between sources of firm learning and improvements in performance based on 650 firms in the United States. His empirical findings confirm the contributions of the above three types of learning to mostly incremental improvements in efficiency. As described here, type I learning is predicated on responding to a stimulus emanating from one's own experience (learning-by-doing) and from user's experience (learning-by-using). Such a learning pattern seems to follow the characteristics of the utilitarian tradition in sociology; therefore, the policy implications drawn from that tradition would be useful for facilitating learning.

As the utilitarian tradition asserts the importance of benchmarking operations and open communication of good practices, it is crucial for an organization to clarify the type of behaviour members should emulate to adopt and how their progress toward the adoption can be verified. They do not necessarily need to have a cognitive understanding of why the behaviour they try to adopt works better than others. To the extent possible, successes should be codified in operational manuals and production routine, so that individual learning can be shared among the members and also institutionalized as organizational learning.

A part of a firm's existing knowledge base is highly tacit and cannot be codified. The transfer of tacit knowledge within and between organizations is not easy, and in a highly competitive industry, it is often tacit knowledge that impacts performance among firms since, unlike codified knowledge, it is more idiosyncratic to an organization (Maier, Prange and Rosenstiel, 2001). For diffusing such knowledge within an organization, the view of the micro-interactionist tradition provides useful insights as it is more concerned with context-specific learning. Recognizing that knowledge is embedded in the environment in which it is used, the situated learning theory in the micro-interactionist

tradition puts emphasis on learning within the context as a whole because culture, routine and human relationships give specific meaning to knowledge unique to the location. Therefore, integration of learners and their full participation in a local work situation become essential for such learning.

Tacit, practice-based knowledge might not be possible to codify fully in the interest of an organization, but with repeated practice expertise can be gained. Moreover, by continuously increasing one's knowledge, there is a greater possibility that experts will be able to separate knowledge from practice and communicate and institutionalize the knowledge for organizational learning. The concept of reflexivity can provide the link between knowing *in* and knowing *a* practice (Gherardi and Nicolini, 2001). Knowing a practice demands a distance between the subject and the object where no distinction exists. It also entails reflecting on the experience and dissecting the practices and outcomes.

A production process that one has learned in practice can be divided into distinct parts in order to analyze the contribution of each part, in terms of function and cost, for example, following value analysis. In the analysis, one assesses the value of each part--function (including quality, flexibility and speed) divided by costs--and presents ideas on how to improve the value by studying product design, materials, equipment, operation procedure, information flow and so on. In this way, the practitioner (subject) who was part of the production process (learning object) can distance himself from the object and start learning the practice. This reflection on a practice by experts, which is similar to codification, helps to extract knowledge embedded in a practice and to defuse knowledge within an organization. The accumulation of knowledge in writing and practices (routines) through learning-by-doing and learning-by-using, could enhance type I organizational learning. However, these ways of learning may not be effective in a situation which requires change, rather than improvement, in existing operations, in order to adapt to a new environment. This is because in such a case accumulated knowledge for existing operations becomes less relevant, or creates obstacles, to change.

Type II learning

When an organization faces a drastic change in its operational environment, at least initially type I learning might not be of much help as it is more applicable for making improvements within the existing operational environment. Thus, type II learning has to take place. In a sense, type I learning is part of type II learning because the new course of operations set by type II learning has to be consolidated and refined by type I learning to ensure continuous improvement. The importance of behavioural learning is emphasized in type I learning since the learning is often conducted by newcomers who need to master an operation which is already known to work, or by existing members to further improve a known operation by adding tacit or context-specific knowledge. In such a case, participation and practice of behavioural learning, for example, on-the-job training and learning-by-doing, play a major role rather than understanding–cognitive learning. However, when the need for type II learning arises, due to a change in its operational environment, there is high scope for cognition to make contribution. When such a change occurs, the organization first needs to understand the nature of the change based on an appropriate analytical method before embarking on type I learning. At this stage of high uncertainty in its operational environment, behavioural learning, such as trial and error, could be time-consuming and expensive.

Collecting circumstantial evidence and following a proper analytical procedure, an organization rationally draws an inference on the kind and extent of change in the environment. This analytical exercise allows a narrowing down of the options for subsequent changes that have to be made on the strategies, structure and operations of organizations. It should be stressed here that, as discussed in the theoretical contribution of Durkheimian tradition, the organizational response to environmental change is bounded (Rosenstiel and Koch, 2001). Organizations might delegate such an analytical exercise to a limited number of staff whose analytical scope and skills may be limited. Or the existing learning procedure may direct an organization to follow certain analytical processes, which may not be appropriate to assess the kind of change facing the organization. Just as with other activities, learning activities of organizations are likely to be path dependent building on their past experiences. Such continuity in learning

activities, based on past experiences, helps an organization to focus its learning on issues relevant to its activities but it naturally limits the scope of learning and is often inadequate when a drastic change in the environment occurs. In such a case, the learning procedure itself has to be learned. This corresponds with Bateson's type III learning, or with Deutero-learning of Argyris and Schon (Pawlowsky, 2001).

While the resulting improvements in existing production, such as an increase in output and cost reduction, largely emanate from type I learning--learning-by-doing and learning-by-using Malerba's study (1992) indicates that type II learning for adapting products to new market environments and customer demands results more from interactions with users and suppliers, and searching (research and development). These activities involve inquiries on product as well as factor markets and scientific applications, and hence facilitate cognitive learning which is deemed necessary in type II learning. Even the collection of sufficient data and the application of proper learning procedures cannot guarantee a positive change if the organization's vision, culture and past experiences block the adoption of a necessary change, as illustrated in the case of IBM (Fransman, 1998). In such a case, type III organizational learning, as defined earlier in this paper, would be necessary.

Once type II learning succeeds in determining a new course of operations suitable to the new environment, the relative importance of learning shifts from type II to type I learning as the operations have to be consolidated and continuously refined. Following this, the accumulation of experience within the set operations improves performance increasingly. However, as continuous refinement will result in a close to perfect operation, further gains by type I learning will be increasingly difficult. At this point, the organization has to develop a new product, market or production process. This would once again require type II learning, thus completing the learning cycle (Nooteboom, 1999).

Policy implications for technical cooperation

The review of relevant theories indicates that individual or organizational learning cannot be grasped independent of one's environment, institutions, past experiences and relationships with others. Knowledge to be learned has a specific meaning in a local setting and, therefore, learners cannot take full advantage of knowledge in practice without participating in and becoming familiar with the local environment in which knowledge is embedded. Due consideration of these characteristics of learning reveals the constraints often facing technical cooperation (TC) and makes a few suggestions for improvement.

A review of TC documents and the evaluation reports point out that the lack of ownership and sustainability are the two major obstacles that deter TC projects from achieving their intended objectives. These related problems are serious because they are often concerned with the fundamentals of the reasons for a project's existence. If beneficiaries do not feel they own a project but are only passively involved in project activities under the supervision of international experts, why is such a project necessary in the first place? If there is limited sustainability of project impacts beyond the project period, probably most such projects will not withstand the test of cost-benefit analysis to justify the positive values of their projects. This is because the present values of only a few years of project benefits would most likely be lower than the monetary investment and opportunity costs of projects. The low sustainability is often due to low ownership by beneficiaries. Lack of pro-active participation by beneficiaries during a project period could most likely lead to the stagnation, if not termination, of their project activities once monetary and technical support for a project ceases. Therefore, the presence of ownership is an essential condition for implementing TC projects. Without sustainability a project cannot be considered a success even if the project was able to achieve all the planned outputs during the project period. The next question that arises is, why do TC projects continue to face such problems despite repeated calls for improvement in evaluations?

The above theoretical reviews indicate that these problems are associated with the lack of learning, which can be both the cause and effect of the problems. First of all, the theories suggest that integrating people in a learning community is crucial at both the stage of determining a direction of learning and the stage of consolidating and improving learning in that direction. Thus, in such circumstances, knowledge transfer to beneficiaries is likely to be facilitated if the beneficiaries can enjoy full ownership of the project and, in so doing, recognize the need for learning and are able to understand the importance of the knowledge within the context of their own circumstances. This realization of problems, potential solutions and, above all, the desire to learn to improve the situation of beneficiaries are necessary ingredients for them to gain ownership as well as for the success and sustainability of project impact.

There is no short cut to this process. External consultants may be able to facilitate the process and provide different options, which might become available to beneficiaries. However, they should play only a marginal role, especially in the crucial initial process and indeed for all project activities. This is a necessary learning process for beneficiaries as they can prepare themselves for subsequent learning through project activities. This is something that cannot be implemented on behalf of beneficiaries. The more thoroughly they reflect their past, analyze the current situations and plan possible courses of action, the higher the likelihood that their levels of commitment and subsequent learning will increase, leading to possible success.

From the theoretical perspective, this cognitive learning by beneficiaries is essential because this exploratory stage, which sets the learning course, corresponds with type II learning in theory. Type II learning enables one to acquire kinds of knowledge necessary to make changes in their way of operation when a change in the working environment occurs. For such learning, the importance of cognitive learning was emphasized in the theory related to type I learning, since it is costly to individuals, organizations and communities to embark on learning without a systematic analysis of the nature of change and the possible impact on the working environment. All these indicate that, however helpful external assistance might be, beneficiaries themselves should devote time to

undertake a thorough search, starting from reflecting on their past, then objectively analyzing the current situation and finally make a realistic assessment of future actions. Only through this process, will they be able to relate the project to their own situations and gain ownership.

In light of the above discussion, TC projects of many development agencies do not seem to have paid sufficient attention to this nor did they allocate appropriate time for the above-mentioned crucial preparatory phase for and by beneficiaries. Project managers are often under pressure to increase implementation. They therefore often concern themselves more with the delivery of such planned activities, measured on the basis of spending, than on how much beneficiaries really receive, in terms of improvement in the cognitive and behavioural aspects. Accordingly, the initial learning stage, which is neither visible, in terms of active external interventions, nor rewarding for project implementers, in terms of the progress measured by monetary spending, tends to receive little attention from project managers.

This supply orientation of TC projects appears to be attributed not only to the existing incentive system governing TC projects, but also to the stance of development agencies on TC. Their basic orientation towards TC is to transfer skills, knowledge and equipment to beneficiaries—unidirectional flow of resources not one of interactive relationships for mutual learning. Once agencies receive a project request from representative organizations, such as ministries, local governments or interest groups, following a basic field research with limited interactions with direct beneficiaries, they tend to formulate a project based mostly on the logic of how to transfer the core expertise through a standard pattern of project activities based on their past project experiences. The project formulated as such is usually implemented in accordance with a planned schedule and budgetary allocations. This well planned supply machine which is then highly pressurized for implementation is not closely monitored, nor significantly modified or stopped by the beneficiaries unless suppliers themselves choose to do so.

In the case of TC, there exists information asymmetry between development agents and beneficiaries. The latter is supposed to learn and gain expertise through project activities. Hence, by definition, they do not know exactly what to expect prior to TC implementation. What they do know is that they will receive a project through which they will gain something without spending the corresponding amount of resources. So from the viewpoint of beneficiaries, there are no strong reasons for objecting to a set menu prepared by development agencies. This is often convenient for agencies that desire immediate implementation in line with their original schedule and planned activities as much as possible. These underlying motives and incentives determine the relationship between the suppliers and recipients of a project until completion of the project. For projects conditioned by such a relationship, it is not the beneficiaries but the suppliers that are likely to take a central role throughout the project implementation period, thus determining the specificities of activities and setting the pace of implementation. Indeed, the fact that “implementation” and “delivery” become such buzz words during the project implementation phase attests the supply orientation of development projects.

Theoretical discussion in this paper seems to point out that in such TC projects the scope of learning for beneficiaries is significantly curtailed. Even though on the surface projects may be making visible progress by completing planned activities and obligating project funds, they may not necessarily be making the corresponding progress on the ultimate objective of many projects, namely, sustainable capacity building, in which learning by beneficiaries is a key. As discussed, this is partly due to the lack of involvement in the initial thorough search process by beneficiaries for their own problem identification within the context of their community. This is likely to lead to the failure of type II learning and subsequently to limited ownership by beneficiaries. The importance of type II learning can be understood not only from the viewpoint of strengthening ownership but also breaking away from the existing course of development, which is usually path-dependent.

The review of the theoretical literature pointed out that path dependency is a characteristic of both individual and organizational learning. Without an opportunity to

establish a cognitive change in their development path through a thorough and systematic situational analysis, namely, type II learning, beneficiaries might passively receive project activities and fail to digest their meaning in relation to their own context and internalize the underlying knowledge to the local setting. This would make project activities unsustainable after the project period—certainly after a change in beneficiaries' socio-economic environment, which is a real test of the sustainability. If beneficiaries had thorough cognitive as well as behavioural learning, they would be able to adapt the learned capabilities to their changing environment. This sort of sustainability can be acquired only if beneficiaries have proper type II learning on their own initiative at the beginning of the project, that is, conduct their own search process in order to break away from their past development course. These earned analytical and search capabilities become the foundation for absorbing, internalizing and adapting technical knowledge. Thus, without such a foundation, technical skills and knowledge provided by external agents will not take root in the community of beneficiaries and will certainly not develop further when the socio-economic environment changes.

So far the discussions centred round the importance of beneficiaries' integration into the formulation, planning and implementation phases of a project by assuming a key position in each activity, with supplementary support from external agents. In order for a project to achieve sustainable effects in a local setting, integration should also apply to development agents. Once beneficiaries have conducted the necessary search process, through type II learning with the assistance of external agents, and have paved the way for a change in their development course, the theoretical discussion points out that relative importance shifts from type II to type I learning. This allows for future refining and continuous improvement in skills and knowledge brought by external agents. In the context of a development project, it does not necessarily mean further upgrading of skills and knowledge, but usually adaptation of them to a local setting in order to make it work better and ensure its sustainability in a particular environment.

The theoretical sections suggest that knowledge is never neutral and defined in a local context through culture, routines and language. It is, therefore, presumptuous to assume

that knowledge can be transferred from one place to another in isolation of the context that it is used. In order to fully internalize knowledge and make effective use of it, knowledge and the context in which it is used should be learned together. This can be only done through participation of development agents in the community that uses such knowledge, moving first from peripheral then gradually to a central position, as argued by the situated learning theory (Lave and Wenger, 1991). In this regard, “participatory development,” a phrase often referred to an approach encouraging the participation of beneficiaries in a development project, should be applicable to external development agents—for them to have participatory learning in the community. It is imperative that external agents learn the operations of a community through participation and understand how the community’s culture, relationships and institutions may shape and give a new meaning to the knowledge brought by them. In the absence of such participation and understanding of a beneficiary community, the development project is likely to have a negative impact on the internalization and sustainability of the knowledge in the community.

Thorough critical assessments of past and future courses of development by beneficiaries with the assistance of external development agents and also the agents’ participatory learning in a community will prepare both parties for a developmental change within a community. For the effective adaptation of the knowledge, beneficiaries should examine how new knowledge can fit into their environment and make the necessary adjustments to their operations. Agents, for their part, should study how the new environment can absorb the knowledge they bring in and likewise make the necessary adjustments to such knowledge. From these respective positions, their interactive learning throughout the project implementation phase will help to translate, integrate and anchor the externally introduced knowledge within the community. A key principle which has to be upheld by beneficiaries and external agents is their commitment to the central role of the former and marginal role of the latter. A project produces sustainable impacts not because of the delivery of project activities by the agents, but only through the occurrence of learning by beneficiaries. External agents cannot learn for the beneficiaries.

Final remarks

The paper first discussed the distinct characteristics of organizational learning as against individual learning and then illustrated how the theories of different schools of learning contributed to understanding the collective learning of organizational members and aggregate learning at the level of organization in changing external environments. Finally, the discussion was summarized by showing how theories contribute to explaining the different types of learning undertaken for continuously improving operations, managing discontinuity in existing operations, and reforming the organizational principles and culture, which underpin formal and informal institutions of organizations, especially when faced with the need to cope with the most fundamental change in the organization.

In light of the theoretical discussion, the implications for TC work of development agencies were derived in order to understand the causes of the two inter-related prevalent problems—lack of ownership and sustainability. It showed how the supply-driven approach of TC projects, often institutionalized in development agencies and their relationship with donors, is in conflict with the approach conducive to the learning of beneficiaries, a necessary condition for generating and sustaining the impact.

Understandably, the project implementation figure is an important measure reflecting the relevance of development agencies. Due to its perceived objectivity, it has been used extensively. However, if the true objective of development projects is not delivery but the maximization of impacts and sustainability, it is important to understand how learning of beneficiaries takes place and how external agents could best assist the process. Otherwise, short-term increase in the implementation figure will sacrifice the long-term reputation of development agencies, which could in turn eventually lead to a decline in the implementation figures.

References

- Andersen, Esben S. 1992. "Approaching National Systems of Innovation from the Production and Linkage Structure" In *National Systems of Innovation*, ed. Lundvall. London: Pinter Publishers.
- Antal, Ariance B. and Camilla Krebsbach-Gnath. 2001. "Consultants as Agents of Organizational Learning: The Importance of Marginality" In *Handbook of Organizational Learning and Knowledge*, ed. Meinolf Dierkes, Ariance B. Antal, John Child and Ikujiro Nonaka, 462-483. New York: Oxford University Press.
- Argote, Linda, Sara L. Beckman and Dennis Epple. 1990. "The Persistence and Transfer of Learning in Industrial Settings" *Management Science*, 36(2): 140-154.
- Bierly, Paul E., and Paula S. Daly. 2007. "Sources of External Organizational Learning in Small Manufacturing Firms" *International Journal of Technology Management*, 38(1/2): 45-68.
- Boerner, Christopher S., Jeffrey T. Macher and David J. Teece. 2001. "A Review and Assessment of Organizational Learning in Economic Theories" In *Handbook of Organizational Learning and Knowledge*, ed. Meinolf Dierkes, Ariance B. Antal, John Child, and Ikujiro Nonaka, 89-117. New York: Oxford University Press.
- Czarniawska, Barbara. 2001. "Anthropology and Organizational Learning" In *Handbook of Organizational Learning and Knowledge*, ed. Meinolf Dierkes, Ariance B. Antal, John Child and Ikujiro Nonaka, 118-136. New York: Oxford University Press.
- Dahl, Michael S. and Pedersen, Christian O. R. 2004. "Knowledge Flows through Informal Contacts in Industrial Clusters: Myth Or Reality?" *Research Policy*, 33: 1673-1686.
- Dierkes, Meinolf, Ariance B. Antal, John Child, and Ikujiro Nonaka, ed. 2001. *Handbook of Organizational Learning and Knowledge*. Oxford: Oxford University Press.
- Dierkes, Meinolf, Lutz Marz, and Casey Teele. 2001. "Technological Visions, Technological Development, and Organizational Learning" In *Handbook of Organizational Learning and Knowledge*, ed. Meinolf Dierkes, Ariance B. Antal, John Child and Ikujiro Nonaka, 282-301. New York: Oxford University Press.
- Fear, Jeffrey R. 2001. "Thinking Historically about Organizational Learning" In *Handbook of Organizational Learning and Knowledge*, ed. Meinolf Dierkes, Ariance B. Antal, John Child and Ikujiro Nonaka, 162-191. New York: Oxford University Press.

- Fransman, Martin. 1998. "Information, Knowledge, Vision and Theories of the Firm" In *Technology, Organization, and Competitiveness*, ed. Dosi, G et al. New York: Oxford University Press.
- Gherardi, Silvia and Davide Nicolini. 2001. "The Sociological Foundations of Organizational Learning" In *Handbook of Organizational Learning and Knowledge*, ed. Meinolf Dierkes, Ariance B. Antal, John Child and Ikujiro Nonaka, 35-60. New York: Oxford University Press.
- Gjerding, Allan N. 1992. "Work Organization and the Innovation Design Dilemma" In *National Systems of Innovation*, ed. B. Lundvall. London: Pinter Publishers.
- Glasmeier, Amy K., Kurt Fuelihart, Irwin Feller, and Melvin M. Mark. 1998. "The Relevance of Firm-Learning Theories to the Design and Evaluation of Manufacturing Modernization Programs" *Economic Development Quarterly*, 12: 107-124.
- Jones, Colin. 2004. "An Alternative View of Small Firm Adaptation" *Journal of Small Business and Enterprise Development*, 11(3): 362-370.
- Kadtler, Jurgen. 2001. "Social Movements and Interest Groups as Triggers for Organizational Learning" In *Handbook of Organizational Learning and Knowledge*, ed. Meinolf Dierkes, Ariance B. Antal, John Child and Ikujiro Nonaka, 221-241. New York: Oxford University Press.
- LaPalombara, Joseph. 2001. "The Underestimated Contributions of Political Science to Organizational Learning" In *Handbook of Organizational Learning and Knowledge*, ed. Meinolf Dierkes, Ariance B. Antal, John Child and Ikujiro Nonaka, 137-161. New York: Oxford University Press.
- Lave, Jean and Etienne Wenger. 1991. *Situated Learning: Legitimate Peripheral Participation*, Cambridge: Cambridge University Press.
- Lazonick, Willam and Jonathan West. 1998. "Organizational Integration and Competitive Advantage: Explaining Strategy and Performance in American Industry" In *Technology, Organization, and Competitiveness*, ed. Dosi, G. et al. New York: Oxford University Press.
- Macpherson, Allan and Robin Holt. 2007. "Knowledge, Learning and Small Firm Growth: A Systematic Review of the Evidence" *Research Policy*, 36: 172-192.
- Maier, Gunter W., Christiane Prange, and von L. Rosenstiel. 2001. "Psychological Perspectives of Organizational Learning" In *Handbook of Organizational Learning and Knowledge*, ed. Meinolf Dierkes, Ariance B. Antal, John Child and Ikujiro Nonaka, 14-34. New York: Oxford University Press.

- Malerba, Franco. 1992. "Learning by Firms and Incremental Technical Change" *The Economic Journal*, 102: 845-859.
- Merkens, Hans, Mike Geppert and David Antal. 2001. "Triggers of Organizational Learning during the Transformation Process in Central European Countries" In *Handbook of Organizational Learning and Knowledge*, ed. Meinolf Dierkes, Ariance B. Antal, John Child and Ikujiro Nonaka, 242-263. New York: Oxford University Press.
- Mohr, Jakki J. and Sanjit Sengupta. 2002. "Managing the Paradox of Inter-Firm Learning: The Role of Governance Mechanisms" *The Journal of Business and Industrial Marketing*, 17(4): 282-301.
- Morris, Mike, John Bessant, and Justin Barnes. 2006. "Using Learning Networks to Enable Industrial Development: Case Studies from South Africa" *International Journal of Operations and Production Management*, 26(5): 532-557.
- Morrone, Mario. 2006. "Basic Conditions" In *Knowledge, Scale and Transactions in the Theory of the Firm*, ed. Mario, Morrone, 24-88. Cambridge, UK: Cambridge University Press.
- . 2006. "Introduction and Summary" In *Knowledge, Scale and Transactions in the Theory of the Firm*, ed. Mario, Morrone, 1-23. Cambridge, UK: Cambridge University Press.
- Nooteboom, Bart. 1999. "Innovation, Learning and Industrial Organization" *Cambridge Journal of Economics*, 23(2): 127-150.
- Pawlowsky, Peter. 2001. "The Treatment of Organizational Learning in Management Science" In *Handbook of Organizational Learning and Knowledge*, ed. Meinolf Dierkes, Ariance B. Antal, John Child and Ikujiro Nonaka, 61-88. New York: Oxford University Press.
- Perez-Aleman, Paola. 2005. "Cluster Formation, Institutions and Learning: The Emergence of Clusters and Development in Chile" *Industrial and Corporate Change*, 14(4): 651-677.
- Rosenstiel, Lutz v. and Stefan Koch. 2001. "Change in Socioeconomic Values as a Trigger of Organizational Learning" In *Handbook of Organizational Learning and Knowledge*, ed. Meinolf Dierkes, Ariance B. Antal, John Child and Ikujiro Nonaka, 198-220. New York: Oxford University Press.
- Starbuck, William H. and Bo Hedberg. 2001. "How Organizations Learn from Success and Failure" In *Handbook of Organizational Learning and Knowledge*, ed. Meinolf Dierkes, Ariance B. Antal, John Child and Ikujiro Nonaka, 327-350. New York: Oxford University Press.

- Stopford, John M. 2001. "Organizational Learning as Guided Responses to Market Signals" In *Handbook of Organizational Learning and Knowledge*, ed. Meinolf Dierkes, Ariance B. Antal, John Child and Ikujiro Nonaka, 264-281. New York: Oxford University Press.
- Teece, David J. 2000. "Firm Capabilities and Economic Development: Implications for Newly Industrializing Economies" In *Technology, Learning, and Innovation*, ed. Linsu Kim and Richard R. Nelson, 105-128. Cambridge, UK: Cambridge University Press.
- Wyer, Peter, Jane Mason, and Nick Theodorakopoulos. 2000. "Small Business Development and the "Learning Organisation" *International Journal of Entrepreneurial Behaviour & Research*, 6(4): 239.



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Telephone: (+43-1) 26026-0, Fax: (+43-1) 26926-69
E-mail: unido@unido.org, Internet: <http://www.unido.org>