

**A Training Manual for Training of Trainers on  
Knowledge Management Learning Process**

**Volume 3**

By

**Bedru Beshir (PhD)**

**Training Organized by  
Ministry of Agriculture (MoA), Participatory  
Small-Scale Irrigation Development Program  
(PASIDP) and  
Ethiopian Institute of Agriculture Research,  
Melkassa Agricultural Research Center**

**August 2018**

**Adama, Ethiopia**

## Table of contents

Table of contents .....	I
Knowledge Management and Learning Process .....	2
Introduction .....	2
Learning styles.....	6
Levels of learning and relationship with decision making.....	9
The relationship between learning and decision-making.....	10
Central and peripheral routes of learning .....	11
The centrality of relevant feedback .....	12
Factors that may affect learning (pre-conditions and obstacles) .....	14
The relative importance/seriousness of an experienced problem .....	15
Direct involvement with a problem .....	16
Aspects of learning .....	20
Bibliography .....	22

# **Knowledge Management and Learning Process**

*Bedru Beshir, Agricultural Extension and Communication, Melkassa Agricultural  
Research Center of the EIAR;*

*Email: [bedrubeshir2009@gmail.com](mailto:bedrubeshir2009@gmail.com); phone: +251 911 382489*

## **Introduction**

When we mention learning in the context of innovation, we are not talking about compulsory classroom situations where teachers try to foster and test learning on a fixed curriculum. In rural agrarian settings, we are usually dealing with adults who are involved in farming and/or other livelihood activities, and who are confronted with changing circumstances and problems that require innovation. Here (social) learning is less of a goal in itself, is often more voluntary, and is immediately connected with diverse human interests and changes in professional practice. Because of the immediate relations with practice, Kolb's (1984) model of 'experiential' learning is widely used as a basis for organizing communication for innovation (Figure 1). The model describes how people learn through experience. This type of learning is very 'powerful'; it appears that conclusions drawn by people themselves on the basis of their own experiences tend to have a greater impact than insights formulated by others on the basis of experiences that learners cannot identify with. It is also referred to as 'learning by doing' or 'discovery learning'. Kolb's (1984) asserted that, "Learning is

the process whereby knowledge is created through the transformation of experience.

Kolb's model indicates that learning occurs from a continuous interaction and iteration between thinking and action: concrete actions result in certain experiences, which are reflected upon (also against the background of relevant non-experiential insights), and subsequently generate cognitive changes, from which new actions can emerge, etc. This model implies that learning can be enhanced by actively supporting the basic steps and translations that take place during learning, and by offering new learning opportunities. One can, for example, actively encourage experimentation, widen the range of observations made, stimulate processes of reflection, and assist in drawing conclusions.

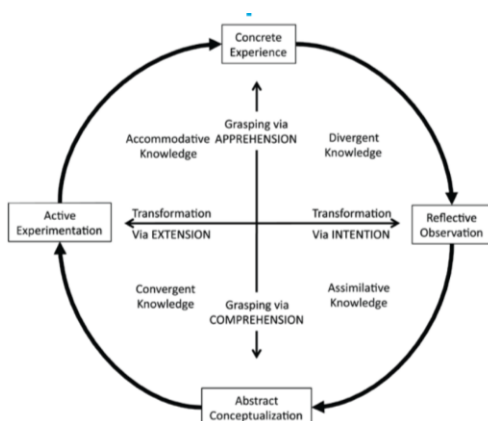


Figure 1. David A. Kolb's Model of Experiential Learning Process.

## **Principles of Adult Learning**

### **1. Adults are autonomous and self-directed**

Adults need to be free to direct their own learning. If the learning engagement is classroom-based, the facilitator must actively involve adult participants in the learning process. Specifically, they have to be sure to act as facilitators, guiding participants to their own knowledge rather than supplying them with all of the facts. They should allow the participants to assume responsibility for their learning and engage them in discussions, presentations and group-based tasks.

### **2. Adults bring knowledge and experience to each learning activity**

Over their lives, adults have accumulated a wealth of life experiences and knowledge. This may include family memories, work-related experiences, and previous education. Linking new material in a course to learners' existing knowledge and experience creates a powerful and relevant learning experience. Relating theories and concepts to the participants and recognizing the value of experience in learning are two important factors to keep in mind while doing adult education.

### **3. Adults need learning to be relevant and practical**

Every day, the human brain takes in hundreds of thousands of sensory inputs. As the brain processes these inputs, it begins to sort out information it deems relevant and important. Relevancy increases the likelihood information will be retained. Adults must see a reason for learning something and the learning must be applicable to their work

or other responsibilities in order for it to be valuable for them. Therefore, learning engagements must identify objectives for adult participants before the course begins. By nature, most adults are practical about their learning. Typically, they will focus on the aspects of a program most useful to them in their work. Participants must know how the content will be useful to them.

#### **4. Adults are goal-oriented**

Adults primarily participate in learning programs to achieve a particular goal. Therefore, they appreciate an educational program that is organized and has clearly defined learning objectives. These need to be communicated early in training program or course.

#### **5. Adults are problem-oriented and want to apply what they've learned**

Adult learners want to be able to apply their learning to their work or personal life immediately. Using examples to help them see the connection between classroom theories and practical application; utilizing problem-solving activities as part of the learning experience; and creating action plans together with learners are important concepts that enable life application.

#### **6. Adults are motivated by intrinsic and extrinsic factors**

Learning is driven by participant motivation – the more motivated someone is to participate in training, the more he or she is likely to learn and retain information. Adults are motivated by both internal and

external factors. During the first several weeks on the job, adults are highly motivated to learn. Similarly, motivation is high when they are faced with learning a new work process or approach to a problem. However, as they become more familiar with the content, learners' motivation to learn may wane until a specific need arises.

### **7. Adults are pressed for time**

In today's fast-paced world, adults have to cope with demanding jobs, family responsibilities, and community commitments. Even if they are highly motivated to learn, the pressures of life often limit the time many adults can invest in learning. Therefore, in many cases, learning must be available when it is convenient for the learner and delivered in manageable ways.

### **8. Adults have different learning styles**

A learning style refers to how a person learns, categorizes, and processes new content. Each person may have multiple preferred learning styles. In training, each of these styles should be considered when delivering content.

## **Learning styles**

**K**olb uses his model not only to describe how experiential learning takes place, but also to indicate that different people learn in different ways. There are four universal learning

styles that Kolb distinguishes. We do not go into details of the styles. However, Kolb's idea that different people tend to learn in different ways is valuable, as it teaches us that different people may need different forms of support in reaching similar conclusions. Relevant dimensions for diversity in this respect include:

- **Abstract versus concrete:** Some people learn easily with the help of abstract concepts, while others learn more effectively through concrete sensorial experiences. In relation to the management of minerals in the soil, for example, some people prefer to work with complex calculations and parameters in order to compare and determine nutrient losses and soil conditions over the years. Other people find it difficult to relate to such abstract figures, and prefer other indicators. To get an idea about changes in the nutrient status, they may, for example, look at the color of the grass, study the presence of particular weeds, observe the physical condition of the land, taste the crop, etc. According to their preference, these farmers may value different types of support from communication workers.
- **Diverging versus converging:** Some people tend to jump to conclusions quickly on the basis of certain experiences (i.e. they converge easily), whereas others tend to diverge into all sorts alternative explanations that require further testing and elaboration, and find it difficult to arrive at solid inferences. Such people run different risks (changing too quickly versus not



changing at all), and may want or require different forms of support.

- **Holistic versus reductionistic:** Perhaps partly overlapping with the previous dimension, some learners are more inclined to learn about 'parts' whereas others have a greater affinity with looking at 'wholes. Taking mineral management as an example, some farmers are inclined to focus on the mineral aspects of the farm only, while others immediately forge linkages with other levels and domains.
- **Individual versus group:** Some people have a clear preference for learning with others, while others are less inclined to involve others in their learning process. Some farmers, for example, like to discuss problems and experiences in a study group or group meeting, while others tend to avoid group sessions and prefer to figure things out by themselves, or through bilateral contacts only. In some instances, this seems to be associated with having a co-operative versus a competitive outlook on the issue at hand.
- **External versus internal motivation:** Depending in part on the issues at hand people may experience an 'internal' drive to learn about something, or feel more or less 'forced' by others to engage in it. In other words, they may have or develop a real interest in a topic and be enthusiastic to learn more about it, or they may learn mainly because they fear negative consequences if they do not.

Again, communication workers are wise to develop specific strategies and support for the different groups.

- 

### **Levels of learning and relationship with decision making**

This typically involves learning ‘how to do things better’ within the basic cognitive assumptions and principles (e.g. norms, values, goals) that underlie current practices. When such basic assumptions and principles themselves become the subject of learning (usually in the case of architectural innovation), it is called ‘double loop’ learning. This type of learning is much more demanding (and sometimes threatening), because it involves questioning and perhaps letting go of the basic certainties, goals and values that one acted upon previously. If, for example, a farmer who is used to applying fertilizers, pesticides and herbicides in single crops changes over to biological farming, he or she will have to learn how to deal with farmyard manure, intercropping, complex rotations, biological pest control and a new network of people and institutions. There also a third learning which Argyris and Schön call it a ‘triple loop’ learning, which essentially involves learning about learning; in other words, questioning the current methods, techniques and forms of feedback through which learning is organized. A farmer may, for example, realize that he or she always discovers animal health problems too late, and may search for new routines for observation and registration that improve feedback and learning on health conditions.

## **The relationship between learning and decision-making**

In this short note, it is more useful and realistic to regard decision-making as the final outcome of longer lasting learning processes with varying degrees of deliberateness and consciousness, involving also what Giddens (1984) has called 'reflexive monitoring of action'. It is the monitoring of social actors continuously and routinely on their practices as an integral part of the ongoing flow of life and experience. In this view, decisions 'grow' over time, partly unnoticed. When considering the building of a new greenhouse, for example, a horticulturist may consider all sorts of experiences and stories that he or she has encountered in the last 5 or 10 years when visiting or meeting with other greenhouse horticulturists, even if such encounters themselves were not part of a deliberate, rational, decision-making process. In fact, through time and experience the grower may already have slowly developed a number of specific ideas regarding the optimal lay-out of the greenhouse, the materials and glass to be used, the type of heating system to be installed, etc. When the moment of taking final decisions arrives, the most important ideas regarding the design of the greenhouse may have crystallized long ago, while the only decision remaining may be who will build the greenhouse against what price.

Thus, the best way of enhancing and supporting decision-making, then, is to stimulate and encourage continuous **experiential learning**. On the basis of such regular learning, people can identify which issues and

problems need to be tackled, and can gradually collect the necessary insights and experiences to inform and shape conclusions that, in retrospect, may be called 'decisions. However, all of this does not imply that normative decision-making models are useless. They may help structure one's thoughts and reach sensible actions, particularly in areas or situations (e.g. unexpected crises) where limited experiential learning has taken place, while at the same time urgent action is needed.

### **Central and peripheral routes of learning**

In relation to attitude change researchers such as Petty and Cacioppo (1986) speak of a 'central' and a 'peripheral' route towards attitude change. In terms of learning, these two routes are characterized by a different 'depth' of learning. Petty and Cacioppo speak of the 'central route', when people change their perceptions and aspirations on the basis of careful elaboration of arguments and counter-arguments (i.e. in much the same way as suggested by rational decision-making models). However, they emphasize that people may also form or change attitudes in a much more peripheral way, in which arguments are not carefully scrutinized. Here, people rely on triggers and cues that accompany the use of arguments, *such as the number of arguments for and against that are presented, the attractiveness of presentation, the perceived credibility of the source, the opinions of significant others, the number of people who seem to agree*, etc. Emotional appeals and affective associations too

can be considered as peripheral triggers. It can be 'rational' and effective to change perceptions, aspirations and practices on such grounds, as it may help to deal with complex issues and situations, without spending too much energy on elaboration. However, studies suggest that changes arrived at through the central route tend to be more robust than changes induced through peripheral triggers; that is, in the former case perceptions and aspirations are less prone to alter in the face of newly presented counter-arguments, are more likely to be accompanied by changes in practice, and tend to last longer. For change agents these insights are important, because they imply that striving for durable changes requires the stimulation of more active (i.e. central) forms of learning. This is in line with the earlier emphasized importance of 'discovery learning'.

### **The centrality of relevant feedback**

Feedback plays an important role in shaping human practices. This is basically because it is a crucial mechanism in human learning. Feedback is information we get about the outcomes, characteristics and/or consequences of our actions, and it helps us to evaluate these. Such information can come from different sources, can be varied in nature (depending on the area of learning involved), and can vary in quality of precision, reliability, validity, etc. In particular, when feedback is somehow

'disturbing' it can trigger learning processes. Almost anything can be feedback in relation to something. A few examples may help to clarify this:

- (1) In schools' teachers often give grades to students, which are supposed to be indicative of students' knowledge and abilities in certain areas; i.e. grades are meant to give feedback on how students are performing.
- (2) A farmer may make a rough visual estimate or a very precise measurement of maize yields per hectare, and compare that information with similar estimates/ measurements from previous years and/or other farmers in order to assess whether certain changes in farming practice were positive or negative.
- (3) A communication worker may organize a meeting and observe that several people fell asleep during that meeting, and infer that something was wrong with the topic of the meeting and/or the way it was administered.
- (4) A person may be told by a colleague that other people in the organization find the way he operates offensive and non-tactical, and conclude that it might be a good idea to work on his social skills.
- (5) A farmer may accidentally get to talk to an urban dweller, and conclude from the discussion that consumers have totally different perceptions regarding food quality and safety from those of farmers, and that there is a need to bridge the gap.

Of course, the feedback we get is not always optimal or complete, and also the conclusions we draw from it can be misguided. In relation to the above examples, it may well be that:

- Example 1 Students' grades are affected by the bad quality of the teachers' exams.
- Example 2 Yield estimates are too rough to be meaningful and/or yield measurements are affected by unaccounted harvesting for own consumption.
- Example 3 The attendees at the meeting fell asleep because they attended a party the previous night.
- Example 4 The colleague was not genuine and/or was expressing his own rather than other people's views.
- Example 5 The urban dweller was totally unrepresentative of consumers in general.
- 

### **Factors that may affect learning (pre-conditions and obstacles)**

We live in a dynamic society and ecosystem, which implies that there are many situations in which human learning is required. Despite the need for learning, however, groups and/or individuals are often not inclined to learn, or only start learning when problems have become immense. This can even happen in situations where confrontational feedback is readily available. For that a number of factors and processes that help us understand better why learning takes place or not, which adds to the idea that learning requires a certain amount of feedback. In general terms, the question of why people learn or not can be understood with the help of our model for understanding farmers' practices, as 'learning' can be considered as 'a practice' as well. In other

words, here too factors like frame of reference, social pressure and self-efficacy are important. This point is highlighted and translated some issues that are specifically important in relation to learning.

It is important to recognise that learning takes effort, energy and time. This means that learning can be considered 'a scarce resource'. In other words, people are selective in their investments in learning. A factor often mentioned is 'motivation to learn'. This variable expresses that in order to take on a particular learning challenge, people must be motivated to do so. What interrelated factors and processes may influence people's motivation to learn?

### **The relative importance/seriousness of an experienced problem**

Learning requires first of all that people experience a problem (a 'problem' can be defined as a perceived tension between an existing state of affairs, for example, environmental degradation, or labor scarcity, and a desired state of affairs (less degradation, sufficient labor), which means that in their frame of reference (i.e., perceived - technical and socioeconomic- consequences plus perceptions of (un)certainly, likelihood and risk plus valuation of consequences and risks regarding aspiration) there must be a tension between their aspirations and their perception of reality. Depending on the priority of the aspirations involved, and the perceived magnitude of the tension between the desired state-of-affairs and the current state-of-affairs, people may define a problem as relatively important and serious, or not. In principle, people can be expected to select the more serious



problems for learning, provided that they have some confidence in the possibilities of solving the problem. However, serious problems may also be ignored when they are somehow experienced as highly threatening.

### **Direct involvement with a problem**

A slightly different issue is whether or not people are personally affected by the consequences of a problem. People may regard a problem, e.g. poverty, as serious and important, but may not experience the consequences personally. When people are personally involved with an issue (e.g. a pest management problem) in the sense that their immediate aspirations are threatened, they may be more inclined to learn (e.g. about pest control). In such situations we refer to high 'personal relevance' or 'outcome-relevant involvement'. However, it is important to recognize that even then, people's eagerness to learn may be restricted to certain topics, and may in fact actively exclude other topics. If, for example, farmers are affected by pest infestations from a nearby nature reserve, they may want to learn about pest control (or about strategies to get rid of the reserve) but it does not mean that they are necessarily interested in learning about the importance of nature conservation. Thus, high involvement may simultaneously enhance and obstruct learning.

It is also true for forms of involvement other than direct 'personal relevance'. Johnson and Eagly (1989) speak, for example, about 'value

relevant involvement' when wider values are involved instead of concrete interests. A person may, on the basis of religious values and convictions, be strongly against or in favor of the use of contraceptives, without any direct personal involvement with the issue. In connection with this, he or she may be eager to learn about certain things (e.g. how to prevent extra-marital sex) and not about others (e.g. how to encourage people to use condoms).

## **Urgency**

When people feel there is an urgent need to solve a problem, they are often more motivated to engage in learning than when learning can easily be postponed. Urgency can be more or less inherent in a problem, but it can also be created artificially. The occurrence of a particular pest, for example, may well require immediate action and learning if one wishes to prevent substantial yield losses. In less urgent cases (e.g. solving erosion problems, efficient use of irrigation water, pest control) urgency may be deliberately created by governments or Non-Government Organizations who wish to subsidize erosion prevention activities and infrastructures, for example by issuing a clear deadline for submitting community plans to combat erosion, for example.

### **Self-efficacy and environmental efficacy**

To invest in learning, people must have some confidence that they can solve the problem; that is, they must trust their own capacities with regard to problem-solving and/or have the idea that they will be supported effectively by others in finding and implementing solutions. Whenever such confidence is lacking (e.g. because of negative experiences in the past), learning is less likely to occur. In the context of multi-actor situations, an important aspect of efficacy is that of mutually experienced interdependence. If an actor does not feel interdependent on others for solving a problematic situation, or if the impression exists that others do not reciprocate his or her feelings of interdependence, willingness to engage in social learning may be reduced.

### **Complexity, observability and triability**

In connection with efficacy, the complexity of problems may also indirectly affect people's motivation to learn. If people feel that problems are highly complex technically or socially, their perceived self-efficacy and environmental efficacy may be reduced. Complexity, then, is clearly related to the level of learning required. In addition, some problem areas can be more easily learned about than others. Here two aspects play a role: observability and triability.

In some areas of learning, the processes involved can be easily observed with the help of the human senses. In the technical sphere it is probably

easier for many to learn about how the soil responds physically to different mechanical treatments, than about how fungi respond to different chemical treatments. Similarly, in the social sphere it is easier to learn about how to organize a stimulating group meeting on a particular topic, than it is to learn about how to facilitate negotiation processes among stakeholders. A group meeting is an oversee able event where one can receive direct feedback on the way people feel about it, whereas negotiation processes involve numerous interactions over time, many of which take place behind the scenes, and on which it may be less easy to get clear feedback due to complex interdependencies. Tangibility and observability can sometimes be enhanced considerably by the provision of creative forms of feedback. With the help of certain measurement tools or computer animations, for example, it may be possible to get a better understanding of the way fungi behave and respond to chemicals.

Triability can also facilitate or hinder learning. Triability refers to the extent to which learning can be supported through small-scale experiments. Small trials allow people to optimize new practices and technologies before applying them on a bigger scale, and thus reduce the risks of large-scale failures. However, some devices or treatments are difficult to incorporate in a small-scale learning trial: it is not so easy to experiment on a small scale with a modern combine harvester, a completely different rotation system, a new irrigation scheme, or new land tenure arrangements. This 'inflexibility' may slow down learning

processes in particular areas. In some cases, triability can be enhanced by simulations, including computer simulations. For example, it can be possible for farmers to 'experiment' with irrigated agriculture by providing small water tanks before an irrigation system is ready. Or a computer simulation model can calculate the benefits, costs and risks of using a totally different rotation system. In essence, issues like observability and triability relate to whether or not relevant feedback for learning can be easily organized.

### **Stress and trauma**

Learning can be stimulated by dissatisfaction with existing situations and outside pressures. In such cases problems and tensions work productively. However, in certain situations farmers may face so many problems and tensions that they cannot deal with them. Farmer become overwhelmed by the different pressures, can no longer distinguish between priorities, and 'break down' and/or become apathetic to their environment. Similar states of mental trauma can result from various forms of abuse and violence. It usually takes a long time for people to recover.

### **Aspects of learning**

When considering both the insights on learning presented so far and the tasks in interactive innovation processes. We can identify the

following aspects of learning that participants in a social learning process must go through:

- becoming aware;
- becoming interested/mobilized;
- becoming involved in active experiential (social) learning (in the context of negotiation);
- establishing adapted practices and routines.

The third and fourth dimensions may involve learning on numerous interconnected topics and issues (the functioning of agro-ecological systems; the functioning of social systems; Human aspirations and tensions in their satisfaction; the effectiveness of the social environment; self-efficacy and confidence and the significance and nature of social relations and social pressure). We refer to 'aspects of learning' rather than 'stages' since the order in which 'awareness', 'interest' and 'active experiential learning' occur may vary. Farmers may, for example, become 'aware' and 'interested' in a particular seed variety only after they have had to use it due to unavailability of their preferred seed. It is important for change agents to realize that the learning of different stakeholders and groups of people may, at a given time, have encompassed different aspects of learning, and that for each aspect different types of information can be relevant (1) Knowledge, persuasion, decision adoption or rejection of the innovation or policy measure, implementation adapting the innovation and putting it into

use and (5) Confirmation seeking reinforcement from others for decisions made, leading to continuation or discontinuation).

To become aware of a problematic situation people, require adequate information and feedback on the nature, importance, magnitude and seriousness of a problematic field. For becoming interested and mobilized other issues may be more relevant, for example, information regarding personal consequences, opportunities and threats, urgency and the possibility of effectively contributing to problem-solving (efficacy issues). When people become actively involved in experiential learning and negotiation (aspect 3), different matters become important, such as information on organizational and technical solutions, and the perspectives and positions of other stakeholders. For the establishment of new socio-technical routines and practices (aspect 4), stakeholders may require feedback on the effectiveness of their practices, as well as information on whether or not other stakeholders follow the agreements and arrangements made.

## **Summary**

## **Bibliography**

Dalkir, K. (2005). Knowledge management in theory and practice. Elsevier.

Leeuwis, C. and Van den Ban, A. 2004. Communication for Rural Innovation. Rethinking Agricultural Extension. Third Edition