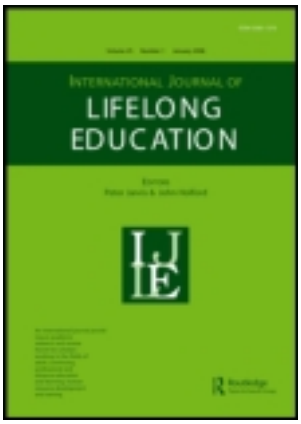

International Journal of Lifelong Education

Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/tled20

Experiential learning, self-beliefs and adult performance in Senegal

ABDOU NDOYE [a]

[a] University of Connecticut, USA

Version of record first published: 11 Nov 2010.

To cite this article: ABDOU NDOYE (2003): Experiential learning, self-beliefs and adult performance in Senegal, International Journal of Lifelong Education, 22:4, 353-366

To link to this article: http://dx.doi.org/10.1080/02601370304831

INT. J. OF LIFELONG EDUCATION, VOL. 22, NO. 4 (JULY–AUGUST 2003), 353–366

Experiential learning, self-beliefs and adult performance in Senegal

ABDOU NDOYE
University of Connecticut, USA

Ability to update skills constitutes a key element in the process of improving adults' performance. Professional skills are usually updated through engagement in active learning by connecting prior experiences to new ones and also sharing information with others through reflection and hands-on activities. Such learning processes can be achieved through experiential learning. Experiential learning can lead to creation of retrievable knowledge, which can be applied to their daily professional activity. Results of this study indicated that experiential learning needs to be rooted in the culture and values of the social environment in which adults live. Further, individual characteristics may influence the impact of experiential learning on adult professionals' abilities to reach higher levels of performance. A random sample of 126 farmers was selected. Data were collected through a questionnaire and were examined by quantitative as well as qualitative data analysis techniques.

Introduction

The Senegalese agricultural sector occupies more than 75% of the working population. Regardless of the fact that they comprise the majority of the workers, Senegalese farmers only contribute 22% of Senegalese national gross product (NGP) (Ba 1994).

Farming constitutes the main source of income in Senegalese rural areas. Most of Senegalese farmers' income is obtained from peanuts, the most widely grown crop, which provides 75% of farmers' earnings (Ba 1994). Agricultural yields in Senegal are very low (Reardon *et al.* 1996). Kelly *et al.* (1996) reported that peanut yield has declined from 1007 kilogrammes per hectare (kg ha^{-1}) in 1965 to 801 kg ha^{-1} in 1996. Furthermore, Martin (1988) reported that the average peanut yield in West Africa is 1000 kg ha^{-1} when rainfall is good with a limited use of technology. Therefore, farmers' level of income is highly dependent upon their ability to increase productivity.

Since agriculture relies on rainfall, droughts have caused a number of problems including hunger, decreases in productivity and depopulation in rural areas.

Problem statement

Over the years the decline in farm productivity has affected farmers' level of income. Kelly *et al.* (1996) reported an average annual income of 296 000 CFA

Abdou Ndoye, PhD, is an Assistant Extension Professor at the College of Continuing Studies, University of Connecticut, One Bishop Circle, U-4056, Storrs, CT 06269, USA. His work and research interests include adult learning and professional development and community development and local capacity building. He has worked in Senegal in training and sustainable development.

International Journal of Lifelong Education ISSN 0260-1370 print/ISSN 1464-519X online © 2003 Taylor & Francis Ltd
http://www.tandf.co.uk/journals
DOI: 10.1080/0260137032000094779

Francs (about 540 US dollars) in Senegalese rural areas. Farmers' low income impacts their abilities to purchase agricultural inputs and equipment that could potentially improve their yields and increase productivity. Researchers and policy-makers have emphasized the importance of educating farmers for the pursuit of higher agricultural productivity in Senegal.

Because of the belief that education can lead to higher farm yields, extension services have been instituted in Senegal to promote methods of increasing Senegalese farmers' productivity (Kelly *et al.* 1996). Through extension services' efforts, educational models have been developed to improve current farming techniques and introduce new techniques.

Extension services' initiatives to improve agricultural productivity have been hampered mainly by farmers' low level of literacy. Senegalese farmers are usually illiterate or have a low level of literacy. Most farmers have little formal schooling. Furthermore, the success of some extension service attempts to increase farmers' productivity has been limited by the educational model introduced to farmers. For example, extension service models have been based on a formal schooling model that emphasizes a knowledge provider and knowledge seeker relationship (Diouf 1997). Such a learning relationship might fit in a western cultural context but may not be appropriate in a more traditional context where learning is more of a collective activity than an individual endeavour. Therefore, different learning models that would place the farmers in a central position need to be explored. Such learning models should be adapted to the farmers' environment as well as their experiences and practices as suggested by experiential learning advocates (Percy 1999).

Theoretical framework

Experiential learning can be defined as a knowledge creation process through which new experiences are integrated into prior experiences and transformed into relevant, durable and retrievable knowledge suitable for use in the learners' environment (Kolb 1984, Sheckley and Keeton 1997). Theories of adult learning and professional development emphasize that experiential learning may help foster professional development. According to experiential learning theory (Kolb 1984, Sheckley and Allen 1989, Sheckley and Keeton 1997) learning involves a constant interaction between an individual and his or her experiences and environment.

In the experiential learning process, the main emphasis lies in the learner's action. In other words, experiential learning advocates stipulate that an individual would learn more if actively engaged in the learning process (Doebbert 1994). For learning to occur there must be a direct relationship and connection between the learner and the topic. Such a connection happens through the link between prior experiences and new knowledge leading to a higher level of learning. In fact, the quality of the body of prior experience is ensured through grasping and transforming new information into a body of adapted knowledge. 'Learning is knowledge dependent, people use current knowledge to create new knowledge' (Resnick 1989: 2).

Experiential learning allows adult professionals to construct durable and retrievable knowledge that they can rely on to move to a higher level of competency in their professional lives (Sheckley and Keeton 1997). Experiential learning '. . .

promotes development by enabling a person to reduce the gap between current and potential development' (Sheckley and Allen 1989: 146). Research (Beauchamp *et al.* 1996) has indicated that experiential learning can help adult professionals improve their levels of performance.

According to Kolb (1984), and also Boud *et al.* (1993), adults adapt to their professional and social environment by reflecting and acting upon a rich body of experiences. Further successful adaptation depends on the quantity and also the quality of prior experience. As Ericcson *et al.* (1993: 367) stated, the design of a 'learning task should take into account the preexisting knowledge of the learners so that it can be correctly understood'. Applying adult learning principles to agricultural extension in Sierra Leone, Ebun-Cole (1992) reported that adult farmers perceived their prior experiences as the most valuable resources and any rejection of those experiences may be perceived as a rejection of their own identities.

Knowledge creation also requires that adults reflect on the information available to them. As Sheckley and Allen (1989: 11) pointed out 'learning involves selecting relevant information and interpreting it through one's existing knowledge'. Selecting and interpreting information are performed through a reflective practice process that enhances adults' capacities to improve their problem-solving skills as well as analytical skills.

The reflective process is also accompanied and fostered through deliberate practice or hands-on learning. Hands-on activities allow adult professionals to extend and apply their learning to the external world in order to face daily challenges and promote learning through the 'errors and impasses that appear to be necessary to lead subjects to change their cognitive processes and representations' (Ericsson and Hastie 1994: 66). Engaging in practice or hands-on activities allow adults to achieve 'an increase in the knowledge base and this in turn permits rapid retrieval of relevant information' (Berry and Dienes 1993: 12).

The current study was conducted with Senegalese farmers with the assumption that the farmers who actively engage in experiential learning will be more productive. Most of the research reviewed explored the relationship between experiential learning and productivity in a modernized context with educated adult professionals who had access to formal schooling. However, little research has been undertaken to explore learning patterns of adults living in traditional environments with limited or no access to formal schooling. In order to fill this gap, the current study explored the following research questions:

1. What factors related to experiential learning practices do farmers engage in to increase productivity?
2. What other factors are related to farmers' productivity?

Methods

A random sample of 126 adult farmers was selected from a population of 1252 farmers in the centre of Senegal, a region known as the peanut basin. For sampling purposes, the total number of farmers was recorded on a list and one-tenth of the farmers on the list were randomly drawn. There was no attempt to classify or categorize farmers, because they all grow the same crop, and there were no

differences in terms of land quality, seed variety and the like. Level of formal education was also very low, with none of the farmers above the elementary school level. Non-formal education in the form of literacy programmes or religious schooling was the most prevalent type of education among farmers. Further, farmers in this study were all covered by the same extension services. All farmers in the sample were male and they all grew peanuts, which is the cash crop in that area. The mean age for farmers is 55 years old, with a minimum of 22 years and a maximum of 76 years old. The average years of experience in farming was 37.8 (SD = 16.5) with a minimum of 4 years to a maximum of 76 years of experience. There were no major differences in terms of land quality since the farmers were living in the same ecological zone. Agriculture in that zone is rain fed and is characterized by a low level of modernization.

Data collection

Data were collected using a questionnaire made of close-ended as well as open-ended questions. Qualitative interviewing techniques were combined with quantitative measures to gather data. Qualitative data were recorded mainly through note taking. Interviews were individually conducted in the homes of the farmers or in their fields by indigenous interviewers during the rainy season. The rainy season was preferred because that is the period of the year when farmers are actively engaged in farming activities since agriculture in this area is primarily rain fed. Prior to conducting the interviews, interviewers were trained in using the questionnaire, and recording qualitative and quantitative data. Interviews were conducted in Wolof, the local language of the area and the most popular language in Senegal. The length of an interview was about one hour to one and a half hours.

Data analysis

A qualitative approach was taken to analyse the data collected for the first research question. Information gathered was coded and grouped into themes based on farmers' responses (Lincoln and Guba 1985). For research question 2, a quantitative approach was used to measure differences between groups of farmers based on their levels of productivity.

Results

Research question 1: what factors related to experiential learning practices do farmers engage in to increase productivity?

To answer research question 1, farmers were asked first to identify the ways they engage in experiential learning. Overall 96 farmers reported engaging in experiential learning processes. Thirty farmers did not report any learning; therefore they are not included in this analysis. The reasoning behind the decision to exclude farmers who did not report any learning is that if they are unaware of

the learning processes they engaged in, it will be difficult to perform any analysis between learning and productivity. All the learning processes identified related in a way to experiential learning in a sense that they all put great emphasis on farmers' experiences. Further learning processes either involve hands-on activities, or exchange of information whether it is active (discussions with other farmers) or passive (observation) or both. Data were coded and gathered into five major themes: (1) trial and error, (2) discussion with other farmers, (3) observation, (4) guided practice, and (5) reflection on one's prior experience (table 1).

Theme 1: Trial and error enriches learning. Many farmers (28.1%) reported that trial and error was an important means by which they engaged in learning. The farmers in this category learned new techniques on their own. These farmers reported that 'new techniques need to be repeated and tried until you master them, that way you learn from your mistakes and become more efficient'.

An important aspect of the trial and error process in which farmers engaged was small-scale experimentation. Farmers reported that they needed to experiment on their own to test out new skills or techniques in order to learn about them. For these farmers, practice was not supervised. Instead, practice was based on their own abilities and understandings of the practical dimension of a task as reflected. Consider this farmer's comment: 'Experimenting on a small scale helps avoid unwanted negative effects. This procedure will also allow me to compare it with other techniques, and master the required skills'. The only feedback for these farmers is the impact of the results they obtained from trying a new technique. Trial and error in that sense can be perceived as hands-on learning which is one of the many ways to engage in experiential learning. In fact, hands-on activities allow farmers to immediately put their experiences into practice, and take action to gain concrete new experience about a task.

Table 1. What factors explain the experiential learning processes farmers engage in to increase productivity? (n = 96)

Themes	*Frequency (%)*	*Illustrative comments*
Trial and error enriches learning	28.1	'I try it on my own based on explanations I have heard about it'
Discussions with other farmers promote reflection, and thereby enhance learning	22.9	'We always discuss with the first farmers who adopted the new techniques and learn to improve the techniques'
Observation enhances learning	20.8	'Observing the outcomes of what others do will motivate me or not to learn in order to improve production'
Guided practice favours learning	18.7	'With the group, we explore things in more detail due to the important number of questions and input from everyone concerned'
Reflection on a rich body of relevant experience enhances learning	9.3	'Forty years of practice allows me to think ahead and anticipate eventual problems that may negatively affect my productivity'

Theme 2: Discussions with other farmers enhance reflection and thereby enhance learning. About 22.9% of the sample declared that discussions with other farmers enhanced their learning processes. Discussions with other farmers allowed farmers to exchange experiences and engage in collective learning: 'We always discuss with the first farmers who adopted the new techniques and learn to improve the techniques'.

Farmers stressed the importance of discussions with and feedback from others as valuable aids for enhancing their own experiential learning processes: 'through discussion with other farmers like me, I happen to integrate views I did not consider at the beginning'. Furthermore, farmers made it clear that discussions with others who have similar concerns allowed them to revisit their frames of reference and to integrate new ideas and views. For this reason, farmers sought out ways to expand their levels of knowledge through contact with other colleagues. Contact with other farmers encouraged farmers to become active learners: 'discussing issues with other farmers improves my level of knowledge' and further, 'I trust the knowledge of the farmers who first adopted the new techniques'.

Theme 3: Observation enhances learning. Another way in which farmers engage in experiential learning processes was observation (20.8%). According to these farmers, watching others was like a security check: 'We need to be careful with regard to learning new things, observing others and following their path help get a clear idea about what to do and think about how to do it'.

Since these farmers had little educational support in their practice, watching and observing others provided a good cross-check to see if they were using correct procedures in their practice: 'I watch others and do what they do'. Watching and observing what happens in their immediate environment provides farmers with the opportunity to reflect upon their practice and think about ways to adapt it. Additionally, observation was a means that allowed farmers to become aware of events as they occurred and to engage in learning that created new meaning: 'In my case I always observe others' ways of doing things and try to practice the same things, this has allowed me to increase my productivity'. Observation therefore, was a means to adapt learning to the environment. In fact, through observations, farmers were connecting their experiences to the ones of others within their same environment.

Theme 4: Guided practice enhances learning. Guided practice is undertaken with the involvement of others (18.7%). Others who were involved in the practice process could function as a supervisor or a mentor for other group members. Farmers identified individuals such as extension agents as key guides in the practice process. Farmers indicated that they felt more secure when a person or a group of persons more knowledgeable about the current task guided the experiential learning process: 'I follow the technician and repeat his gestures'.

Farmers reported that uncertainty and doubt hindered the experiential learning process. In other words, farmers in this category engaged in learning when the risks were minimized and when immediate feedback aimed at improving practice was provided: 'I would rather have an extension agent watch me do it'. As Doebbert (1994) indicated, experiential learning is facilitated when there is a sense of confidence and control over the learning task since it is process oriented. In that case, the presence and involvement of others in the learning process reinforces farmers' sense of trust among them. Further guided practice allows farmers to engage in hands-on learning that will directly impact their concrete experience.

Theme 5: Reflection on a rich body of relevant experience enhances learning. Although fewer than 10% of farmers (9.3%) reported that prior experience was an important component of the experiential learning process, their comments were interesting.

Farmers declared that they reflected and took lessons from their previous good or bad experiences: 'After 60 years of practice, I think I have come across all the eventual problems, for which I can have the solutions now if I can think back and use my prior experiences'.

For those farmers, the lack of support from extension services and other support services made them rely on their past experiences which they tried to improve through reflection. Farmers in this category valued their years of experience as a resource to help them maintain the productivity of their farms. In fact, reflection on past experiences allowed these farmers to grasp new information and make the link between what they already knew and current situations: 'Relying on past experiences reduces my error rate' or 'Decisions made without deep reflection on experiences are usually bad decisions'.

Overall, farmers in this study engaged in experiential learning through a variety of methods. In most cases the factors that promoted learning usually involved the presence of others. Regardless of the learning factors identified, the goal remained the same for the farmer: 'How can I improve productivity?' The following section of this paper compares farmers' ways of engaging in experiential learning with respect to their levels of productivity.

Differences between high- versus low-productivity farmers

Once ways of engaging in experiential learning were identified, the 96 farmers were divided into two groups based on level of productivity. The high-productivity group (n = 51) and the low-productivity group (n = 45) were, respectively, in the highest one-third and in the lowest one-third of the sample mean in terms of yield per hectare for peanuts. The mean for peanut yield (n = 126) was 823.6 kg ha^{-1} (SD = 704.7).

When the ways farmers engage in experiential learning are compared to farmers' level of productivity, discussion with other farmers (29.4%) appears to be the most cited way of learning reported by the high-productivity farmers. Trial and error (27.4%) is the second most represented factor cited by the high-productivity group of farmers. Table 2 outlines the results of this analysis.

In regard to the low-productivity group, trial and error (28.8%) and observation (24.4%) appear to be the most cited ways of engaging in learning. It is important to note that the trial and error factor is well represented in each category. Furthermore, the lack of support services and extension agents mean the farmers just try to do things on their own.

Most of the farmers that seemed to learn through active inquiry by engaging in discussions with other farmers are in the high-productivity group (68.2%) in comparison to their counterparts in the low-productivity group (31.8%). On the other hand, farmers in the low-productivity group seemed less likely to seek out new information on their own, preferring instead to follow a more passive approach to experiential learning through observation (55%) and guided practice (55%).

Table 2. Learning factors compared to farmers' productivity

Productivity groups	*Trial and error enriches learning*	*Discussions with other farmers enhances learning*	*Observation enhances learning*	*Guided practice favours learning*	*Reflection on past experiences enhances learning*	*Total*
High productivity (n = 51)	27.4%	29.4%	17.6%	15.6%	9.8%	51
Low productivity (n = 45)	28.8%	15.5%	24.4%	22.2%	8.8%	45
Total						96

In summary, five themes characterize the experiential learning process farmers follow to increase their productivity: (1) trial and error enriches learning, (2) discussions with other farmers promote reflection and thereby enhance learning, (3) observation enhances learning, (4) guided practice favours learning, and (5) reflection on a rich body of relevant experience enhances learning. These results will be further explored in the discussion section of this paper.

Research question 2: What other factors are related to farmers' productivity?

To answer research question 2, farmers were asked to provide a list of additional factors that they think might influence the experiential learning process factors that they engage in to increase their productivity. A group of 103 farmers provided responses with respect to other factors they thought might impact their productivity. More farmers (n = 103) responded to research question 2, because some of the farmers who did not report any learning they engaged in in research question 1, however, felt the need to express the factors that might be related to agricultural performance. Twenty-three farmers who did not report any factors related to their productivity were not included in this analysis. The responses helped to define two groups of farmers.

One group seemed to believe that they had control over the factors that might trigger learning and thus impact their productivity. They also perceived that the environment was something they could act upon and change through a learning process in order to improve their practices. Farmers in this group referred to factors such as conventional inputs (seed, labour, fertilizer), quality of land, setting goals, problem-solving and decision-making skills. Farmers in this group made comments such as 'I always learned from last year's results and analyse how I used the main inputs in order to find out what needs to be changed and what needs to be reinforced' or 'Setting goals is like a personal motivation for me and allows me to devote all the resources available'. Farmers also stated that 'After each season, I gathered the people that work with me in the field and we try to analyse the problems we faced and avoid them for the next season'. Farmers also said that 'Good quality of seed, land, qualified labour and adequate farm equipment positively impact my production'. This group was named the '*internally driven*'

Table 3. Farmers' beliefs and productivity level

Group membership based on farmers' beliefs	*Crops*	*High-productivity group*	*Low-productivity group*	*Total*
Internally driven	Peanut	41 (68.3%)	19 (31.6%)	60
Externally driven	Peanut	14 (32.5%)	29 (67.4%)	43

Note: Percentages represent proportion over total with respect to internal versus external factors and crop. n = 103.

group on the basis of their belief that their productivity was related to their own actions.

A second group was composed of farmers who believed that factors that impact their productivity were beyond their control. Farmers in this group perceived the environment as something they had no influence over and could not be changed in their favour. Farmers in this group made comments such as 'I plant seed and wait for God to provide a good production'. Other farmers in this group said, 'The future belongs to God, He is the only one who knows how much production I will get, I pray that He provides enough'. Other farmers in this group said, 'Each year I just harvest what God gave me' or 'How much production I will have depends on God's will, that is why I do not set goals'. This group was named the '*externally driven*' group based on their belief that factors related to their productivity were beyond their own control.

As shown in table 3, the high-productivity group is composed mostly of farmers from the internally driven group.

The results indicate that there are more farmers from the internally driven group in the high-productivity category (74%) and only 14 out of the 55 farmers (25.4%) in the high-productivity category were from the external factors group. The reverse pattern held for the low-productivity group. Most of the farmers were in the externally driven group (60.4%) with the minority (39.5%) being in the internally driven group.

The mean yield for peanut was higher for the farmers in the internally driven group (1200.73 kg ha^{-1}) than for farmers in the externally driven group (765.98 kg ha^{-1}). As a follow up to this analysis, a *t*-test was computed to find out if there is a significant difference between the internally driven and the externally driven groups with respect to peanut productivity (table 4).

Since the Levene's test for equal variance was significant ($F = 9.97$, $P < 0.002$), the unequal variance results were used for the *t*-test (Norusis 1997). The *t*-test result

Table 4. Results of a *t*-test for farmers' productivity with respect to their beliefs

Variable	*Group membership based on farmers' beliefs*	*Mean (kg ha^{-1})*	*t*	*df*	*Significance (two-tailed)*
Peanut yield	Internally driven	1200.73	3.700	94.06	0.000
	Externally driven	765.98			

for equal variance not assumed is $t = 3.70$ (df = 94.06, $P < 0.000$). Based on the results of the *t*-test, the effect size of group membership on productivity was calculated. Effect size varies between zero and one, and is a measure expressing the effect of group membership (internally or externally driven) on productivity in this case. According to Cohen (1988), Cohen's *d* can be obtained using the following formula ($d = 2t$ ((df)) by multiplying the *t*-value by two and dividing the product by the square root of the degrees of freedom when comparing two groups with a *t*-test. Applying that formula to our study gives us an effect size of $d = 0.76$, which is considered as a large effect size. In a simpler way, being internally driven explains a significant amount (10–13%) of the variance associated with farmers' high productivity (Cohen 1988).

Discussion

The results of this study could be of great importance to government agencies as well as their other local development partners. The study's results suggest three major implications.

Experiential learning as a social construct

First, experiential learning activities among farmers in rural Senegalese villages are made of a social construct that involves the collaboration and involvement of significant others in the immediate social environment of the learner. All of the learning themes reported by farmers require the involvement of peers in the learning process. Even though trial and error and reflection on past experiences seem to be activities carried out by individuals, the results indicate that a farmer needs to interact with peers and other people living in the community before he attempts to use any information to increase the yield of his crops. Furthermore, learning through reflection on past experiences, or trial and error, was socially constructed and reflected the contribution of other farmers in the village.

According to Diouf (1997), Diouf *et al.* (2000) and Reagan (1996), learning in an African community is embedded within the social community. In this study, the measure of learning achieved reflected the amount of social involvement the learner had with other villagers. Unlike western cultures, the measure of learning in a Senegalese village cannot be stated in terms of participation in classroom instruction.

In this study, the social system or the community itself is the learning environment of the farmers. According to Diouf (1997: 182), 'endogenity and usefulness to the community are more determinant in valuing domains of knowledge'. In other words, effective learning needs to be rooted in the social context, as reflected in the results of this study. In fact, according to the more productive farmers in this study, the most effective form of learning was a discussion with other farmers. Diouf (1997: 184) continued by stating that knowledge providers who 'are inside the community are preferred to outsiders because their knowledge is more understandable since it is embedded in the same community's culture'. Farmers in this study stated clearly that they seek out and value the advice of other farmers because they trust their knowledge. Further in the

context of this study, the individual is perceived not as an independent and autonomous person from his or her immediate social environment, but as an element of a social chain that bounds him or her with the others for his or her lifetime (Reagan 1996). Therefore conformity to community values is an important prerequisite in determining learning contents and learning strategies. Conformity to community values is ensured through comparing what is being done in the community with what one needs to learn.

As postulated by Festinger (1954), through comparison with others, individuals can reach a higher level of confidence, which will lead to a higher productivity. Farmers in this study engaged in experiential learning by comparing themselves to other farmers similar and relevant to them because these other farmers live in the same context and face the same problems. As Kehrhahn (1995: 234) states 'if an individual finds that a large number of people in her [or his] social network are engaged in an activity, she [or he] is more likely to engage as well'. According to Kehrhahn, conformity with the immediate social environment of an individual will ease his or her decision-making process with regard to choices that need to be made. Therefore, learning activities oriented towards farmers should be focused more on getting involved with the whole community in which farmers live.

Active learning and high productivity

Second, experiential learning among the farmers in this study yields higher productivity if pursued in an active mode. Farmers who learn through discussions with other farmers may be the most productive ones because of the active and interactive mode of this type of learning. Farmers who discuss techniques with others appear to seek out information more actively than farmers who use more passive learning modes. Therefore, extension services should favour in their mode of delivery an active interaction between farmers. This is important because collaborative learning and involvement of others do not ensure active interaction.

More precisely, observation and guided practice can be considered as passive interaction because farmers in these learning modes just observe what is happening. Further, these farmers limit themselves to what is offered to them and try to apply it as is, while through discussion with others and trial and error, farmers try to adapt the information first before they adopt it and create their own knowledge. Such farmers engage in experiential learning by integrating their prior experience with new information in order to create new meaning. In that sense they are able to adapt new information and develop retrievable cues for better practices.

Extension services need to encourage farmers to engage in active interaction. Such active interaction process will allow farmers to seek information and analyse it by discussing with others and get a chance to expand their level of knowledge by integrating within their own experiences the views of others. Learning activities need also to encourage farmers to take risks by exploring different perspectives of a phenomenon. Specht and Sandlin (1991) reported that using methods such as sharing reactions and explaining concepts to others enhances learners' capacity for memorizing and understanding new concepts. Therefore, farmers who discussed ideas and experiences with other farmers may have developed a deeper understanding of farming concepts than farmers who used less active ways to learn.

Individual characteristics and experiential learning activities

Individual differences separated farmers into two groups: the farmers who are internally driven believed that they had some control over the success of their crops and the ones who are externally driven believed that the success of their farms rested with forces beyond their control. Research (Eyring *et al.* 1993) has shown the importance of individual differences as factors positively influencing skill acquisition and performance achievement. These results help expand experiential learning theories by showing that these theories need to take into account the learners' perception of their ability to influence events within a specific context. The results suggest that farmers who are internally driven have self-beliefs based on their abilities to be an active change agent, which may stimulate their learning potential.

Self-beliefs in one's abilities to make change happen is similar to what Bandura (1993) called self-efficacy. Perceived self-efficacy refers to 'people's beliefs about their capabilities to exercise control over their own level of functioning and over events that affect their lives' (Bandura 1993: 118). Bandura (1993: 125) continued further by stating that people 'who have firm belief in their efficacy, through ingenuity and perseverance, figure out ways of exercising some control, even in environments containing limited opportunities and many constraints'. On the other hand, people who doubt their efficacy 'produce little change even in environments that provide many potential opportunities' (Bandura 1993: 125). Therefore, farmers with high levels of perceived self-efficacy will be likely to develop strategies that will allow them to be successful on their farms. This success, in turn, reinforces and empowers their belief that they have some influence on factors that impact their farms. With this reinforcement and empowerment, farmers can then mobilize resources and develop means that will permit them to face the challenges of their daily life. As Bandura and Jourden (1991: 942) stated 'perceived self-efficacy is concerned with people's beliefs in their capabilities to . . . exercise control over environmental events'.

As Lefcourt (1976: 2) puts it, 'whether people . . . believe that they are actors and can determine their own fates within limits will be seen to be of critical importance to the way in which they cope with stress and engage in challenges'. In other words, farmers' self-belief in their personal efficacy is based on their expectancies that their individual behaviours will have an influence on the success of their farming ventures. Therefore, extension services need also to help farmers raise their awareness about their strengths and capabilities to make change happen.

Conclusion

Government agencies, especially the extension services and other local development agencies, need to develop and design learning activities based on collaborative learning principles. Extension services could design delivery systems that would take into account the characteristics of the social environment and allow farmers to compare themselves with similar others. Such an approach may foster motivation for change (Wills 1992).

Many times development agencies have focused more on the collective aspect of African social environment, giving less importance to the individual characteristics.

The ways individuals take advantage and benefit from opportunities provided by the social environment depend on the individual's personal characteristics. Furthermore, promoting collaborative learning methods, and having farmers share reactions and views can help raise the awareness of the externally driven farmers about their potential to make change happen. Such an approach would make the externally driven farmers shift towards a more internally driven attitude.

Consequently, agricultural innovations as well as extension services' interventions need to integrate strategies that foster the development of personal characteristics like self-efficacy in order to impact positively on their clients' performance. Interventions in the field of agriculture will be most effective if they take into account the learners' characteristics and their cultural context. Agricultural policies need to encourage and value interventions that will help learners actively use their rich background of experience, and transform it into a culturally appropriate body of knowledge that will foster professional development.

In order to meet that challenge, educational systems need to be redesigned to adapt to culture and local values. Redesigning the educational system will require a critical look at the delivery system currently used by adult education specialists. Delivery systems need to put more emphasis on the relationship between learners and knowledge providers. In fact, in the current delivery system, the relationship between learner and knowledge provider is usually based on a classroom design type, while results of this study suggest that the learners are also knowledge providers. Adapting education programmes to adults' cultural context might involve challenging the negative forces embedded in the delivery system that prevent the community from making the giant steps forward, in order to meet technological and development challenges.

Note

This research was supported by the Peanut Collaborative Research Support Program (CRSP), a partnership between the University of Connecticut, Storrs, Connecticut and the National School of Applied Economics (ENEA), Dakar, Senegal.

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