

# An Examination of Theories that Undergird Farmer Field School as an Adult Non-formal Education

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## ABSTRACT

*Farmer Field School (FFS) is a rural and an agricultural extension education programme whose philosophy rests on adult non-formal education. It is a bottom-up participatory extension approach that adapts to the needs of participants. Ever since its development in Indonesia in 1989, there have been many scholarly writings on its effectiveness as an agricultural extension approach. Notably is the acknowledgement that its philosophy is based on adult learning theories. However, based on a review of literature, there have not been sufficient explanations on theories most especially adult learning theories that serve as theoretical frameworks for FFS in Nigeria. This article therefore examines and provides explanations on Habermas theory of communicative action, and adult learning theories that undergird FFS as an agriculture extension programme.*

**Keywords:** Farmer Field School, andragogy, Experiential learning, Experience, extension approach

## INTRODUCTION

The goal of agricultural extension service is to equip farmers with better farming methods to enhance farm productivity, income and living standards of farming communities. Farmer Field School (FFS) is one of the agricultural extension services to achieve this goal by increasing farmers' knowledge, skill, and insight. It is an extension education approach that brings about a paradigm shift in agricultural extension practices. It is a departure from the traditional top-down technology transfer systems. The traditional top-down approach is supply driven; hence, it does not have a direct consultation with the end users of extension technologies, information, and associated services (Adisa & Adeloje, 2012). According to Simpson and Owens (2002), lack of relevance of research themes and extensions messages to the problems of farmers has been found to be a major weakness of the conventional extension approaches. FFS on the other hand, is a bottom-up participatory approach that does not only build on scientific and technological innovations, but also adapt to local ecological, social, economic, and historical contexts and concerns of

participants (Khisra, 2004; Simpson & Owens, 2002; Waddington & White, 2014). Endalew (2009) explains that farmers' first philosophy is the bedrock of FFS which is contrary to the philosophy of the top-down extension approach. Farmers' first philosophy is about enhancing the capacity of farmers to learn, experimentation and technology generation, and decision making.

FFS is defined as a platform as well as a "school without walls" with the main goals of enhancing decision-making skills of farmers, developing their analytical skills, critical thinking and creativity, strengthening knowledge for holistic agro-ecosystem management, and encourage indigenous innovation for sustainable agriculture through the use of local knowledge systems while testing and validating scientific concepts developed elsewhere (Ajani & Onwubuya, 2010; Adisa and Adeloje, 2013;; FAO, 2018; FAO, 2019; Gallagher, 2003; Gwary, Muhammad & Mustapha, 2015; Kenmore, 2002; National Agricultural Extension Research and Liaison Services/Ahmadu Bello University, 2008). It is a pragmatic field-based and farmer-centred education and empowerment that plays a key role in achieving sustainable agriculture (FAO, 2019). It is a learning process whereby a group of farmers come together and engage in a practical learning process over a season/production cycle (FAO, 2019).

It "brings together a group of farmers, livestock herders or fisherfolk, to learn on how to shift towards more sustainable production practices, by better understanding complex agro-ecosystems and by enhancing ecosystem services" (FAO, 2021, p. 1). In it there is reversal learning; both the agricultural researchers and extension workers/facilitators learn from the farmers (Gwary, Muhammad & Mustapha, 2015). It is based on the philosophy that adults learn better through experience rather than passive listening at lectures and demonstrations (Groeneweg, Buju, Rommey, & Minjauw 2006). It focuses on and emphasises learning through experimentation, farmers' ownership, partnership, and group action and uses participatory discovery learning process where farmers' voice and priorities are promoted (Anandajayasekeram, Davies & Workneh, 2007; Asiabaka, 2002; Mancini, 2006). It is more gender sensitive and pro-poor (InterAcademy Council, 2004).

The scope of FFS is broad. It started with integrated pest management (IPM) in rice. Today, it covers a wide range of topics in different countries across the world, adapting its key features of ecological literacy, field-based learning, and group collaboration to different agroecological contexts (FAO, 2019). The topics covered by the FFS are aquaculture; land, water, and natural resources; crops and cropping system;

livestock; and social issues (Table 1). FFS curriculum is flexible. It follows the natural cycle of its subject. It is tailored towards the needs of the farmers and what determine its contents are the specific production system, peculiar problems, and local conditions of the farmers (Adisa & Adeloye, 2012). Every FFS follows a systematic training process that involves the following key steps: observation, group discussion, analysis, decision-making, and action planning (Groeneweg, et.al. 2006). The principles of FFS are: the field as the learning place; facilitation, not teaching; hands-on and discovery-based learning; the farmer as expert; equity and no hierarchy; integrated and learner-centred curriculum; comparative experiments; agro-ecosystem analysis; special topics; team building and social animation; and participatory monitoring and evaluation (Hagiwara, Ogawa, Kariuki, Ndeti & Kimondo, 2011; FAO, 2019). The five core activities of the FFS are: agro-ecosystem analysis (AESA); field comparative experiments; topic of the day (special topic); participatory monitoring and evaluation (PM&E); and group dynamic exercises (Groeneweg, et al, 2006).

#### **STATEMENT OF THE PROBLEM**

Ever since the development of FFS as an agricultural extension programme, there have been several scholarly writings and empirical studies on it, with varying focuses.

These studies are mostly from scholars and researchers in the field of agriculture extension and rural sociology. However, since agricultural extension programme has not been sufficiently incorporated as a component of the adult education discipline in Nigeria, adult education scholars have not sufficiently provided understanding of theories most especially adult learning theories that serve as framework(s) for FFS in Nigeria, despite the acknowledgement that FFS is largely based on adult learning theories. More so, from observations, there has not been interdisciplinary connection between the adult education discipline and that of agricultural extension and rural development in most academic institutions in Nigeria. For instance, in the author's institution, there has not been interdisciplinary collaborative teaching and research between the Department of Adult Education and the Department of Agricultural Extension and Rural Sociology despite the relatedness. As such, this article seeks to answer the questions: 1) what are the theories, most especially adult learning theories that undergird FFS as an agricultural extension programme? and 2) How do these theories serve as framework for FFS as an agriculture extension programme. To answer these questions, the article therefore examined and provided understanding of how Habermas theory of communicative action, and adult learning theories namely:

andragogy and experiential learning theories undergird FFS as an agriculture extension programme within the adult education context in Nigeria.

#### **METHODOLOGY**

This article is based on a theoretical and empirical review of literature on FFS as an agricultural extension education approach that is based on adult non-formal education philosophy. A literature search was carried out through the Google search engine and materials were retrieved from online repository and data bases such as ERIC, ResearchGate and Academia. A literature matrix was done through which the author reviewed both theoretical and empirical studies on FFS. As such, the objectives, methodology, theoretical frameworks, findings and conclusions of different studies were examined. This was with a view to identifying the research gaps with respect to the phenomenon under review. Within the Nigerian context, only few of the theoretical works on the subject matter were done by individual researchers while a large portion was done by organisations and agencies such as: Food and Agricultural Organisation (FAO), InterAcademy Council; National Agricultural Extension Research and Liaison Services/Ahmadu Bello University, Zaria, most of which lacked standard research methodology.

Some of the empirical studies reported in the literature were master's and Ph.D. theses outside of the Nigerian context while others were studies conducted by researchers in the field of agricultural extension and rural development/sociology.

#### ***Conceptual and Theoretical Frameworks that Undergird FFS***

The FFS is a rural and an agricultural extension education approach whose philosophy rests on adult non-formal education (Adisa & Adeloje, 2012; Ajani, & Onwubuya, 2010; 2006; Endalew, 2009; FAO, 2016; FAO; 2018; FAO, 2019; Gallagher, 2003; Groeneweg, et al 2006; van de Fliert & Braun, 2005; Waddington & White, 2014). Adult non-formal education refers to “any planned and structured or organised educational activity that takes place outside the curricula of the formal school system, and/or within or out of the four walls of the formal school system” (Mejiuni, Cranton & Taiwo, 2015, p. xxiii). It is specific as it addresses the specific needs and interests of special groups (Mejiuni, Taiwo & Cranton, 2015; Villar & Celdran, 2013). It is aimed at developing the capacity of adults to work and their training for personal development (Radakovic & Antonijević, 2013). It “is intended to serve identifiable learning clienteles and learning objectives” (Coombs, with Prosser and Ahmed, 1973, p. 11).

Non-formal learning opportunities are “more flexible, and more responsive to localized needs. It also is expressly concerned with social inequalities and often seeks to raise the consciousness of participants towards social action” (Merriam & Brockett, 1997, p. 169-170). Merriam, Caffarella, and Baumgartner (2007) explain that non-formal education opportunities:

tend to be short-term, voluntary, and have few if any prerequisites. However, they typically have a curriculum and often a facilitator. Non-formal educational opportunities are usually local and community-based..... Instructors in both settings emphasized the informality, compressed time, and hands-on, interactive nature of the learning in which the needs and interests of the participants are paramount in the encounter (p. 30).

Both conceptual and theoretical frameworks serve the same purpose in research, therefore, a researcher can use either of the two. A conceptual/theoretical framework refers to “the underlying structure, orientation, and viewpoint of a research study” (Merriam & Simpson, 1995; pp. 23-24). The use of adult learning approaches in agricultural extension programmes dates back to around the 1960s when the Chilean government requested the Brazilian educator Paulo Freire to use his adult literacy methods in Chile’s national agriculture extension programmes (FAO, 2016). The sections below therefore provide understanding of theories: Habermas theory of communicative action; andragogy; and experiential learning that undergird FFS as a rural and an agricultural extension education approach.

### ***Habermas Theory of Communicative Action***

FAO (2016) reports that the three domains of learning namely: technical, practical, and emancipatory (Table 2) in Habermas theory of communicative action (Habermas, 1984) played a significant role in the development of the first FFS with a focus on rice Integrated Pest Management in Indonesia in 1989. According to Mezirow (1991), communicative action “occurs whenever an individual with particular aims communicates with another person in order to arrive at an understanding about the

meaning of a common experience so that they may coordinate their actions in pursuing their respective aims” (p. 96). Mezirow (1991) further explains that technical domain is concerned with controlling and manipulation of people and the environment; the practical involves “determining cause-effect relationships and learning through task-oriented problem solving” (p. 73); while the emancipatory knowledge is gained through critical-reflection and is transformative in nature. With respect to the FFS,

the technical domain focuses on growing a healthy crop in a complex agro-ecosystem and thereby also minimizing pest outbreaks. The practical domain is addressed by encouraging farmers to improve their vocabulary and articulation through participation in critical analysis and presentation of their observations (FAO, 2016, p. 18).

Emancipation is achieved when farmers’ perspective change and “are able to face new problems by investigating their specific situation from an agro-ecosystem

perspective, rather than submit passively to advice from external sources, including farm input suppliers” (p.17).

### **Andragogy**

Andragogy is “the arts and science of helping adults learn” which is contrasted with pedagogy, defined as the art and science of helping children learn (Knowles, 1984, p. 43). The six assumptions of andragogy are: the need to know; the learners’ self-concept; the role of the learners’ experience; readiness to learn; orientation to learning; and motivation.

#### ***The need to know and readiness to learn.***

Adults do not learn simply because they are told to learn. They learn only when they want to learn and know how the learning will benefit them. Knowles (1984) asserts that “adults need to know why they need to learn something before undertaking to learn it..... They “become ready to learn those things they need to know and be able to in order to cope effectively with their real-life situation” (pp. 55 & 58). What this means is that once they are able to ascertain the reason why they need to learn something and the benefit that will accrue to them, they become ready. Knowles further highlight some techniques that educators can use to induce readiness in learners. These include “exposure to models of superior performance, career counseling, and simulation exercise (p. 59).

Similarly, in FFS, facilitators use qualitative methods such as demonstration, practical experimentation, field observation, debate, panel discussion, role play (dramatized sessions), case study, group action, problem solving exercises, brainstorming, simulation game, to encourage farmers to facilitate learning and encourage participants to learn (Ajani & Onwubuya, 2010; Anandajayasekeram, Davis & Workneh, 2007).

### ***The Learners' Self-concept***

Self-directedness is one of the major characteristics of adult learners. They take responsibility for their own decisions, for their own lives (Knowles, 1984). They learn best when they actively contribute to their own learning. Knowles further explain that: "people tend to feel committed to a decision or activity in direct proportion to their participation in or influence on its planning and decision making". (p. 123). In line with this principle, there exists a symbiotic relationship between participants and agricultural extension agents in FFS. Participants figure out things for themselves. They take responsibility for their learning and also take part in discussions, presentations and group activities. Adisa and Adeloje (2012) assert that FFS curriculum is not determined by the facilitators or agricultural extension agents, rather, it is determined by "the specific production

system, priority problems, and local conditions of the farmers groups" (p. 163). Supporting this submission, Ebewore (2013) assert that "FFS is practiced and controlled by the farmers to transform their observations to create a more scientific understanding of the crop plant/livestock agro-ecosystem" (p.74). In their own view, Kebebe, Sheleme & Wondimu (2007) explain that in FFS farmers are the major actors while researchers, agricultural extension agents and non-governmental organisations serve as facilitators or resource centres. Gwary, Muhammad and Mustapha (2015) explain that: "the farmer field school approach is reversal learning, where agricultural researchers and extension agents are learning from the farmers" (p. 230).

### ***The role of learners' experience***

Adults because of their age have accumulated a lot of experiences over time. They have their own beliefs, values, convictions, and their own perceptions, biases, and feelings.). They bring all these forward when they come into learning situation and therefore become great and important resources for learning. Knowles (1984) asserts that "adults come into an educational activity with both a greater volume and a different quality of experience from youths" (p.57). This is the situation in FFS. The FFS serves as a platform where farmers discuss their observation and apply

their previous experiences and new information to make management decisions with the guidance of a facilitator (Ebewore, 2013; Kebebe, Sheleme & Wondimu, 2007). As an informal institution, FFS rests on the assumption that local farmers possess vast amount of knowledge, skills, values and insight that are based on their vast experience and rooted in their own local context (Ajani & Onwubuya, 2010). Supporting this assertion, Gwary, Muhammad and Mustapha (2015) posit that in FFS, farmers are not the object of training but use their experiences as the objects of training. Therefore, existing knowledge, values, skills, insight cultures and practices of the farmers become important resources and form the starting point in the learning process and the ultimate purpose is to improve and expand them (Ajani & Onwubuya; 2010; Ebewore, 2013). Consequently, this necessitates the use of experiential techniques to tap into the participants' experiences in FFS.

### ***Orientation to learning***

Unlike children and youths who are subject-centred in their orientation to learning, adults are problem-centred. They are concerned with acquiring knowledge, understanding skills, values, attitudes, and insights that have practical and immediate relevance to their real-life situations or solving their present problems. Hence, adults learn fast

and are able to remember what they have learned when they can immediately apply the knowledge or skill acquired in their present situation or role. The aim of the FFS is to enable farmers to “develop skills in problem-solving through participatory learning, with group activities designed to empower farmers as well as to promote social cohesion through increased cooperation” (Phillips, Waddington & White 2014, p. 113).

### ***Motivation***

Adults are responsive to both intrinsic and extrinsic factors. Intrinsic motivation means “doing something because it is inherently interesting or enjoyable,” while extrinsic motivation means doing something because it leads to a separable outcome” (Ryan & Deci, 2000, p. 56). Knowles (1984) explains that even though adults respond to some external motivators such as better jobs, promotions, and higher salaries, the most important motivators for them are internal pressures such as self-esteem, job satisfaction and quality of life. He further explains that “as a person matures the motivation to learn is internal” (Knowles 1984, p. 12). Deci, Koethner, and Ryan (1999) observe that:

intrinsic motivation energizes and sustains activities through the spontaneous satisfactions inherent in effective volitional action. It is manifest



in behaviours such as play, exploration, and challenge seeking that people often do for no external rewards. It is thus a prototypic instance of human freedom or autonomy in that people engage in such activity with a full sense of willingness and volition (p. 658).

In line with Knowles (1984) submission, participants in FFS are both motivated by both intrinsic and extrinsic factors. The intrinsic motivators include self-fulfilment, encouragement, and satisfaction, while they are motivated by external factors such as increased, improved, and sustainable production systems which will, in turn, lead to better and sustainable livelihood.

### ***Experiential learning theory***

Kolb is the major proponent of experiential learning theory in the 21st century. Kolb's experiential learning theory is based on the works of scholars such as Dewey's philosophical pragmatism, Lewin's social psychology and Piaget's cognitive development. From these works came six principles that form the basis of experiential learning theory (Kolb, 1984). These are: (1) learning is a process and not an outcome; (2) learning is a continuous process based on experience; (3) learning requires resolution of conflicts between different modes of adaptation; (4) learning is a process of holistic adaptation to the world; (5) learning involves interaction between the learner and

the environment; and (6) learning is a process of knowledge creation.

Experiential learning theory presents a basically different perspective of the learning process in contrast to the learning theories that are based on logic and cognition which accord great prominence to "acquisition, manipulation and recall of abstract symbols, and to behavioural learning theories that deny any role for consciousness and subjective experience in the learning process" (Kolb, 1984, p. 20). He defines learning as: "the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience" (p. 41). According to Kolb, there are two ways of grasping information namely: concrete experience and abstract conceptualisation; and two ways of transforming information namely: reflective observation and active experimentation. Experiential learning is defined as "a process through which a learner constructs knowledge, skill, and value from direct experience" (Luckmann, 1996, p. 7). Experiential learning offers an 'integrative perspective on learning that combines experience, perception, cognition, and behaviour' (Kolb, 1984, p. 21). The theory has four phases of learning cycle namely: concrete experience (learners have personal experiences); reflective observation (learners engage in conscious reflection on their

personal experiences from different perspectives); abstract conceptualization (learners develop generalizations or principles based on their observations to form theories); and active experimentation (learners use these generalisation as a basis for further action where they put to use the knowledge they have gained in more complex situations, which then becomes a new concrete experience and new learning at higher level (Kolb, 1984; Lewis & Williams, 1991).

FFS is based on experiential and participatory learning techniques (Groeneweg, et al, 2006). Concrete experiences are the foundation of learning in FFS. Farmers learn by discovery; they engage in practical learning activities such as observation, experiments, and group analysis on the field. True learning comes from learners' experiences, and the evaluation and reflection of these experiences, from which new thoughts and ideas are formed, resulting in new concepts based upon previous experiences (Moore, Boyd & Dooley, 2010). In FFS, farmers "learn better through experience than from passive listening at lectures or Demonstrations. Therefore, all learning in FFS is by doing, and testing out innovative ideas and practices in the field" (Duveskog, 2013, p. 39). Ebewore (2013) reports that farmers who participated in FFS retain 20% of what they hear, 40% of what they see, 80% of what they discover and

90% of what they discover and is explained to them. Participants in FFS reflect on their field experiences (reflective observation). This reflection then forms the basis for developing new insights, knowledge and understanding (abstract conceptualisation) for future action where they evaluate these new insights, knowledge and understanding in new situation (active experimentation), which in turn forms a new concrete experience and new learning. Georgiou, Zahn, and Meria (2008) assert that: "the heart of experiential learning lies in reflectively observing concrete experience and actively experimenting with abstract conceptualizations" (p. 813). In line with this, Passarelli and Kolb (2011) states that: "learning is best facilitated by a process that draws out the learners' beliefs and ideas about a topic so that they can be examined, tested and integrated with new, more refined ideas" (p. 5). In FFS farmers "handle their own on-farm decisions in which they apply previous experiences and test new technologies.... transform their observations to create a better understanding of their crop–livestock system" (Groeneweg, et.al. 2006, p.2).

#### **CONCLUSION**

In view of the question that informed this study, this article has made clear that FFS is a rural and agricultural extension education approach with a philosophy that is based on

adult non-formal education. It represents a departure from the traditional top-down approach. It is a bottom-up participatory extension approach that adapts to the needs of participants. It is emancipatory and experiential in nature; employs qualitative methods such as practical demonstration, and field observation. All of these are the core elements of the theories that this article reveals as those that undergird FFS as an agriculture extension programme. This

**Recommendations**

1. There should be a constructive collaboration between agriculture extension workers and experts in adult education for effective training of FFS facilitators using the principles of adult learning.
2. FFS approach has an enormous potential to contribute to the achievement of the SDGs. Therefore, there is need to extend FFS approach to other thematic areas in Africa where its application is still limited to crop production.

**Table 1: Scope of Farmer Field School**

Aquaculture	Land, Water and Natural Resources	Crops and Cropping System	Livestock	Social Issues
Fish, rice–fish, seaweed, shrimps etc. Integrate d systems, ponds etc.	Landscape and watershed managemen t, Groundwa ter and surface water Integrated land managemen t, sustainabl e land managemen t, Climate change adaptation Forest managemen t	•Field crops (rice, wheat, maize, tubers, plantains etc.), horticultu ral crops (vegetabl es, fruit crops), commerc ial crops (cotton, coffee, tea etc.), agrofores try •Mixed cropping systems, integrate d systems •Technica l entry points: IPM, IPPM, conservat ion agricultur	•Cows, pigs, poultry, rabbits, bees etc. •Integrated systems. agropastora l/pastoral systems •Technical entry points: disease managemen t, dairy production, antimicrobi al resistance, pasture managemen t	Farming as a business: marketin g and value chains Nutrition and - sensitive agricultu re Sanitatio n and vector-manage ment, pesticide health risks, HIV-AIDS Gender and women empower ment Youth and employ ment Post-conflict,

		e, soil health management, seed production, variety improvement, agrobiodiversity, agroforestry, agroecology, organic agriculture		post-emergency, disaster-risk reduction
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**Source:** Food and Agricultural Organisation (2019).

**Table 2:** Three domains of learning: technical, practical and empowerment/emancipation

Domains of Learning	Characteristics
Technical	Aims at technical control of environment. Characterized by instrumental action. Goal: effective prediction and control of reality Use of hypotheses, experiments, critical discussion as in empirical sciences
Practical	Understanding and

	meaning of social processes with others Characterized by communicative action. Goal: the meaning of interactions and patterns Use of discourse, metaphor, and critical discussion as in historical hermeneutic sciences
Empowerment/emancipation	Internal and environmental factors that inhibit our control over our own lives. Characterized by self-reflective action. Goal: able to differentiate between factors that are beyond our control and those falsely assumed to be beyond our control, to expand our area of action. Self-reflection, critical thinking

**Source:** FAO (2016)

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