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An Assessment of the Sasakawa Africa Fund for Extension Education's (SAFE) Training Program in Mali: Graduates' Perceptions of the Program's Impact on Their Professional Performance

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Abstract

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Keywords

Assessment, Extension, Human capital, Mali, Self-efficacy, Training

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Abstract

The Sasakawa Africa Fund for Extension Education (SAFE) was established in nine African countries to overcome a shortage of qualified extension educators. A study was commissioned on the SAFE program in Mali, where it has operated since 2002. The purpose of this study was to assess SAFE graduates' perceptions regarding their training experiences and its impact on their professional practices. Human capital, experiential learning, social constructivism, and self-efficacy theories supported interpreting the SAFE graduates' perceptions of the competencies acquired and the changes they perceived making to their clients' practices. A purposeful sampling approach was used to survey 50 SAFE graduates. The graduates' responses were gathered using several types of response scales, including Likert-type. The findings revealed that 80% of the respondents were males in their late forties with an average of 17 years of experience in extension. On entering the SAFE training program, 70% held a Technician degree; 30% held a Diplôme Universitaire de Technicien Supérieur (DUTS; Higher Technician Degree); and seven in ten had majored in agriculture. The SAFE graduates perceived, as outcomes of their training, improvements in their professional competence, in their job category, and in their

clients' practices. Moreover, graduates perceived they delivered more "extension services" through demonstrations and discussions with male and female clients after their training, but a smaller increase in interactions with dealers and traders was reported. The researchers recommended increasing female participation in the SAFE training program, focusing more on value-chain-oriented curricula, and conducting an assessment of clients' perceptions of the SAFE-trained extension educators' impact on their practices.

Keywords: Assessment, Extension, Human capital, Mali, Self-efficacy, Training

Introduction and Conceptual Framework

Education is an investment that improves nutrition, health, and the quality of life overall of individuals and their societies. In Africa, the proper investment of resources to support educational endeavors is of paramount importance to the continent's future. Many scholars have considered education a lifelong learning process (e.g., Kahler, Morgan, Holmes, & Bundy, 1985; Knowles, 1962; Knowles & Klevins, 1982). Continuing education or in-service training was a capacity building strategy adopted by Sasakawa Global 2000 through the Sasakawa Africa Fund for Extension Education (SAFE) to upgrade the performance of mid-career extension professionals in nine African countries, including Mali (SAFE, n.d.).

For future improvement of the SAFE training program, it was necessary to assess the perceptions of mid-career extension educators (i.e., graduates) who completed the training, especially regarding their views about its impact on their professional behaviors and related impacts on their clients' practices (Kanté, 2010). That assessment was the purpose of this study. Positing that the most valuable capital are the resources invested in people has its foundation in human capital theory (Cornachione & Daugherty, 2008; Sweetland, 1996). Improvements in income, performance, productivity, and quality services are derived from the resources invested. Human capital theory advocates that education improves the economic capabilities of people (Sweetland, 1996).

Knowles (1962), in describing *andragogy*, explained that adults had the ability to learn and would learn if certain conditions were satisfied, including motivation, clarity of learning objectives, and personal satisfaction (Kahler et al., 1985; Knowles & Klevins, 1982). In the 21st century, extension professionals need to develop their competence to meet the needs of their clientele, including extension educators in Sub-Saharan Africa (SSA) who frequently serve impoverished and marginalized groups, e.g., smallholder and subsistence farmers. The success of extension's services entails the professional development of their personnel, such as technical competencies in multiple program areas as well as skills in leadership, communications, and administration. The competencies most extension organizations strive to develop in their staff are diversified but in the main consist of subject matter expertise, process skills, interpersonal skills, as well as competence in program planning, implementation, and evaluation (Cooper & Graham, 2001; Oklahoma Cooperative Extension Service [OCES], 2009; Traoré, 2008). These objectives are consistent with the SAFE training program.

Theoretical Framework

Experiential learning, social constructivism, and self-efficacy were three relevant theories

used to interpret the SAFE graduates' views on their training experiences, especially in regard to their acquisition of professional competence and its impact. The SAFE training approach links theory to real-life situations and experiential learning opportunities. Kolb (1984) posited that concrete or *real-life* experience and reflection are central components of experiential learning. Knobloch (2003) stated this may include "real experience, concrete experience, reflective thinking, observational learning, abstract conceptualization, risk and responsibility, active experimentation, and teacher-as-facilitator" (p. 25) approaches. The pillars of experiential learning framed by Knobloch (2003) were "learning in a real-life context that involves learners in doing tasks, solving problems, or conducting projects" (p. 26). As a part of their training, the SAFE graduates applied participatory principles and approaches to develop projects leading to the resolution of local problems identified by their clients. SAFE calls these learning activities supervised enterprise projects or SEPs (Kanté, Edwards, & Blackwell, 2013).

Social constructivism theory also supports understanding the graduates' acquisition of professional competence and the related impact on clients' behaviors, because it explains how knowledge and skills are created through experiences and social interactions (Fevre, Rees, & Gorard, 1999; Navarro, 2008). Scholars (e.g., Ajzen, 1991 and Merriam & Caffarrella, 1999) have posited that social factors and interactions affect people's decisions to engage in education and training, which are important sources of knowledge and reflection. Navarro (2008) explained that collaboration, team work, communication, and empowerment of beneficiaries were essential features of successful development programs, which implied change agents, such as extension educators, should possess these skills to be effective.

An individual's perceived beliefs or *self-efficacy* for his or her ability to organize and manage situations was another theoretical basis of this study. Ajzen (1991) and Bandura (1995) explained that a person's level of self-efficacy has an influence on his or her self-confidence and ability to act. The professional development experiences of the SAFE training participants were intended to prepare them to solve their clients' problems. Thereafter, SAFE-trained extension educators were expected to serve as change agents who demonstrated self-efficacy in addressing the challenges of Mali's farmers.

Purpose and Objectives

The purpose of this study was to assess graduates' perceptions of the SAFE training program in Mali regarding how it impacted their professional performance and their clients' practices. Four objectives guided the study: (a) describe selected personal and professional characteristics of the graduates (e.g., gender, age, level of education, field of study, and years of work experience); (b) determine the graduates' views of the program's impact on their work performance; (c) determine the graduates' views of the program's impact on their clients' practices; and (d) determine the graduates' views on their delivery of extension services *before* and *after* the training program.

Methods

A survey questionnaire was used to assess different facets of the SAFE training program and portray the interconnections among the program's curricula, the competence acquired by SAFE training

participants through their training, and the graduates' application of that competence in their jobs as extension educators (i.e., their perceived impact on clients). The study's participants included SAFE training program graduates in the district of Bamako and seven of the eight administrative regions in Mali. The graduates were extension educators employed by the government of Mali. They included males and females who earned the *Maitrise en Vulgarisation Agricole (MVA)* degree of the SAFE training program between 2002 and 2009. The program is equivalent to a bachelor of science (BSc.) degree; it is essentially an agricultural extension degree program (Kanté, 2010).

An updated list of SAFE training program graduates in Mali was obtained from the SAFE coordinators; it constituted the sampling frame of the study. Creswell (2005) defined purposeful sampling as the intentional selection of individuals or sites to understand better the phenomenon under investigation. Opportunistic sampling (Creswell, 2005), a form of purposeful sampling, was used to collect the study's data. The researchers took advantage of the SAFE Graduates' Alumni Association Annual Conference to survey all of the *MVA* graduates who participated in that meeting (n = 23). The survey instrument was hand-delivered to the remainder of the sample, i.e., graduates who did not attend the alumni conference, at their workplaces (n = 27). Although the study's participants were representative of Mali geographically, because they were selected purposively, caution should be followed if generalizing the findings beyond the graduates surveyed.

The graduates' responses were gathered using several response scales, i.e., Likert-type, Yes/No questions, one ranking item, and open-ended questions. A panel of experts reviewed the draft instrument to ensure its content and face validity. The panel included Winrock International's Senior Program Officer for Enterprise and Agriculture, the SAFE West Africa Coordinator, as well as three faculty members in the Department of Agricultural Education, Communications, and Leadership and one faculty member in the Department of Agricultural Economics at Oklahoma State University (OSU). The instrument was developed in English and translated into French for administration.

After obtaining approval of OSU's Institutional Review Board to conduct research with human subjects, the survey instrument was pilot tested with 12 SAFE graduates. The individuals who participated in the pilot test were not included in the study reported here. Results of the pilot test were used to determine the internal consistency of the instrument, i.e., Cronbach's alpha, and make adjustments to the items if needed. All of the alphas exceeded .734 except for the scale that measured graduates' perceptions regarding the frequency of extension services and stakeholder interactions delivered annually *after* their SAFE training. In the case of that scale, the Cronbach's alpha reliability estimate was .580.

The survey instrument was hand-delivered to improve the response rate. Warde (1990) contended that response rates are impacted by the procedure of data collection used. In general, a higher response rate may be achieved by more interaction occurring between potential respondents and the people collecting the data (Warde, 1990). Moreover, interpersonal communication channels are more effective in the Malian culture (Kanté, Dunkel, Williams, Magro, Traoré, & Camara, 2009). In addition, postal mailing services and the Internet are either frequently not accessible or not reliable in Mali.

Fifty French version instruments were completed and returned. Thereafter,

the data were entered, analyzed, and reported in English. Descriptive statistics, including frequencies, percentages, modes, means, standard deviations, and mean differences were calculated. Effect size was also calculated, where appropriate, to describe practical importance of the findings.

Findings/Results

Eighty percent of the graduates surveyed were male. Many were in their late forties; their average age was approaching 47. The graduates averaged 17 years of experience in extension. Seventy percent had entered the SAFE training program with a *Technician* degree; 30% held a *Diplôme Universitaire de Technicien Supérieur* (DUTS; Higher Technician) degree on entrance. Seven in ten had majored or specialized in agriculture during their post-secondary schooling before the SAFE training.

Professional Competence

Nearly all of the graduates perceived the training had either the *highest impact* or a *high impact* on their overall competence as extension educators (see Table 1). The graduates perceived that "extension education principles and methods," "human relation skills," and "fundamental sciences" were the SAFE training domains that prepared them the most to help their clients (see Table 2).

Table 1. Graduates' Perceptions of the SAFE Training's Impact on Their Overall Competence as Extension Educators (N = 50*)*

	f	*%*
Highest impact	19	38.0
High impact	27	54.0
Average impact	4	8.0
Low impact	0	0
Lowest impact	0	0
Total	50	100.0

Table 2. Frequencies and Percentages of Graduates' Rankings Regarding the Impact of Their SAFE Training by Domains (N = 50*)*

Domains	*Lowest Impact*	*Low Impact*	*Some Impact*	*Moderate Impact*	*High Impact*	*Highest Impact*
Extension education principles & methods	3 (6%)	3 (6%)	6 (12%)	7 (14%)	3 (6%)	28 (56%)
Human relation skills	2 (4%)	3 (6%)	4 (8%)	9 (18%)	11 (22%)	21 (42%)
Fundamental sciences	7 (14%)	7 (14%)	3 (6%)	8 (16%)	12 (24%)	13 (26%)
Administration, management, & leadership skills	12 (24%)	8 (16%)	5 (10%)	8 (16%)	9 (18%)	8 (16%)
Practical skills	10 (20%)	13 (26%)	10 (20%)	5 (10%)	5 (10%)	7 (14%)
Technical skills	17 (34%)	5 (10%)	14 (28%)	5 (10%)	4 (8%)	5 (10%)

Note. Due to respondents' inconsistencies in ranking these items, numbers and percentages are greater than 50 and 100% for some columns and less for others. Impact was measured by the relative frequencies and percentages. Scale: *1 = Lowest impact . . . 6 = Highest impact*

Job Category Advancement

All of the graduates were upgraded to an advanced job category, i.e., from category B to A, the highest, after completing the SAFE training. Some of the graduates were appointed to leadership positions or given new responsibilities; however, a few held the same or equivalent positions as before their SAFE training.

Impact on Clients

Nearly two-thirds of the graduates indicated observing changes in clients' practices that they attributed to their SAFE training (see Table 3). The changes were grouped into two types. The graduates perceived that more of their clients used improved plant and soil nutrient management practices (see Table 4) and other improved inputs and practices *after* the SAFE training (see Table 6) than *before*. Paired samples *t*-Tests revealed that graduates' perceptions of their clients' use of improved practices increased significantly post-training (see Tables 5 & 7).

Table 3. SAFE Graduates' Perceptions on Changes Observed in Their Clients' Practices Attributed to Their Training

	f	%
Yes	33	66.0
Not sure	3	6.0
No response	14	28
Total	50	100

Table 4. Graduates' Perceptions on Their Clients' Use of Plant and Soil Nutrient Management Practices Before and After the Graduates' SAFE Training

	Before SAFE Training				After SAFE Training			
	n	*M*	*SD*	*Mode*	*n*	*M*	*SD*	*Mode*
Chemical fert.	49	2.55	1.14	2	48	3.54	1.15	4
Compost	47	2.32	.89	2	48	3.46	1.17	4
Green manure	47	1.55	.90	1	40	2.30	1.27	1

Note. Scale: *1 = None; 2 = A few; 3 = Some; 4 = Many; 5 = Nearly all*

Table 5. A Comparison of Graduates' Before and After Perceptions Regarding Their Clients' Use of Plant and Soil Nutrient Management Practices: Paired Samples t-Tests

Comparisons	*M Diff.*	*SE*	*t*	*df*	Sig.*	Cohen's *d*
Use of chemical fert. before training - Use of chemical fert. after training	.958	.183	5.224	47	.000	.84
Use of compost before training - Use of compost after training	1.106	.123	9.028	46	.000	1.07
Use of green manure before training - Use of green manure after training	.761	.136	5.589	45	.000	.68

Note. *$p < .05$. Effect sizes: small ($d = .20$); medium ($d = .50$); large ($d = .80$) (Hittleman & Simon, 2002)

Table 6. Graduates' Perceptions on Their Clients' Use of Other Inputs and Improved Practices Before and After the Graduates' SAFE Training

	Before SAFE Training				After SAFE Training			
	n	*M*	*SD*	*Mode*	*n*	*M*	*SD*	*Mode*
Improv. Seeds	47	2.26	.87	2	48	3.73	1.14	4
Improv. post-harvest technologies	46	2.00	.70	2	47	3.13	1.17	4
Improv. pest mgt. practices	48	1.81	.82	2	49	2.98	1.20	2
Improv. livestock feeding practices	46	2.24	.97	2	46	3.15	1.33	4
Improv. breeds of livestock	45	2.09	.87	2	45	3.13	1.44	4
Improv. bee keeping	41	1.56	.78	1	47	2.28	1.38	1
Improv. fisheries/aquaculture practices	45	1.47	.62	1	46	2.17	1.16	1

Note. Scale: *1 = None; 2 = A few; 3 = Some; 4 = Many; 5 = Nearly all*

Table 7. A Comparison of Graduates' Before and After Perceptions Regarding Their Clients' Use of Other Inputs and Improved Practices: Paired Samples t-Tests

Comparisons	*M Diff.*	*SE*	*t*	*df*	Sig.*	Cohen's *d*
Use of improv. seeds before training – Use of improv. seeds after training	1.468	.166	8.835	46	.000	1.42
Use of improv. pest. mgt. practices before training – Use of improv. pest mgt pract. after training	1.167	.150	7.785	47	.000	1.13
Use of improv. post-harvest techno. before training – Use of improv. post-harvest techno. after training	1.174	.143	8.182	45	.000	1.23
Use of improv. breeds of livestock before training – Use of improv. breeds of livestock after training	1.044	.193	5.406	44	.000	.87
Use of improv. livestock feeding pract. before training – Use of improv. livestock feeding pract. after training	.844	.193	4.371	44	.000	.72
Use of improv. fisheries/aqua. pract. before training – Use of improv. fisheries/aqua. pract. after training	.636	.134	4.734	43	.000	.68
Use of improv. bee keep. before training – Use of improv. bee keep. after training	.641	.178	3.601	38	.001	.57

Note. *$p < .05$. Effect sizes: small ($d = .20$); medium ($d = .50$); large ($d = .80$) (Hittleman & Simon, 2002)

Regarding graduates' perceptions of their delivery of "extension services," they indicated delivering more demonstrations to and guiding more discussions with clients after their SAFE training (see Table 8). Interactions with dealers and traders also increased, but by less.

Table 8. Comparison of Graduates' Perceptions Regarding the Frequency of Extension Services and Stakeholder Interactions Delivered Annually Before and After Their SAFE Training

	Before		After[a]	
	f	%	*f*	%
Demonstrations				
None	5	10.0	3	6.0
1 to 5	12	24.0	6	12.0
6 to 10	15	30.0	7	14.0
11 to 15	4	8.0	10	20.0
16 or more	14	28.0	24	48.0
Total	50	100.0	50	100.0
Group Discussions				
None	3	6.0	1	2.0
1 to 5	12	24.0	7	14.0
6 to 10	9	18.0	8	16.0
11 to 15	6	12.0	10	20.0
16 or more	17	34.0	21	42.0
Total	47	94.0	47	94.0
Dealer Interactions				
None	28	56.0	15	30.0
1 to 5	12	24.0	14	28.0
6 to 10	3	6.0	11	22.0
11 to 15	2	4.0	4	8.0
16 or more	2	4.0	3	6.0
Total	47	94.0	47	94.0
Trader Interactions				
None	24	48.0	14	28.0
1 to 5	11	22.0	12	24.0
6 to 10	5	10.0	9	18.0
11 to 15	1	2.0	4	8.0
16 or more	6	12.0	8	16.0
Total	47	94.0	47	94.0

Note. [a]The Cronbach alpha reliability estimate for this response scale was .580.

In regard to gender-related service delivery, the graduates indicated they informed and trained one to 20 women per year most frequently, however, more than one-third reported professional contacts with 61 or more females annually (see Table 9). Women were trained about how to form associations or cooperatives and on how to access and manage microloans. Other topics for which information was provided included poverty alleviation, income-generating activities, food processing, commercialization and marketing, literacy, gender issues, and health.

Table 9. The Number of Women Clients Contacted Annually by SAFE Graduates for Service Delivery

Number of Women Contacted	*f*	%
None	4	8.0
1 to 20	16	32.0
21 to 40	7	14.0
41 to 60	5	10.0
61 to 80	5	10.0
81 to 100	4	8.0
More than 100	9	18.0
Total	50	100.0

Conclusions, Implications, Recommendations, and Educational Importance

The study's findings revealed that women were not well represented in the SAFE training program. Only one in five of the graduates was female, which is consistent with SAFE's long-term trend data (SAFE, 2013). Therefore, SAFE officials should continue to strive to develop strategies to recruit and retain more female trainees. Even though a similar recommendation was made by Kabutha (2007), SAFE's pursuit of this aim should be renewed.

A relatively small number of female clients were served annually by the SAFE graduates (see Table 9), even though most of Mali's rural areas have large female populations that play significant roles in food production. Therefore, it is recommended that extension leaders develop policies and undertake actions calibrated to increase the delivery of extension services to more women in Mali. The recruitment of more females to extension may assist in this effort. More training on gender issues and gender sensitivity also may be needed during the SAFE program.

The SAFE graduates reported their training enabled them to develop competence that improved their overall job performance; they perceived their clients were served better as a consequence. Per Ajzen (1991) and Bandura (1995), the graduates' views represent an improvement in self-efficacy in regard to their job roles. Therefore, it was concluded the SAFE program reached its goal of upgrading the skills of mid-career extension educators in Mali so they could enhance agricultural production and the quality of life of rural clients. In particular, "extension education principles and methods," "human relation skills," and "fundamental sciences" (see Table 2) should be included in the SAFE training curriculum going forward.

However, the graduates perceived their training in the domains of "technical skills," "practical skills," and "administration, management, and leadership skills" had a lesser impact on their clients. The graduates' perceptions in this regard may imply the following: Were the courses provided in these domains sufficiently responsive or relevant to the trainees and, by extension, their clients' needs? Were the courses taught effectively? Did post-training application problems emerge that hindered the graduates in using their knowledge and skills in these areas? These questions warrant additional study by

SAFE officials as well as interested researchers.

The graduates also perceived their clients' use of plant and soil nutrient management and other improved inputs and practices increased *after* they completed the SAFE training (see Tables 4, 5, 6, & 7). Moreover, these findings had practical importance. Therefore, it was concluded that the graduates applied their improved competence in these areas to make positive changes in clients' practices. This conclusion is in agreement with SAFE's training assessments in Ethiopia and in Ghana (Kabutha, 2007; Owens, Zinnah, Annor-Frempong, & Obeng, 2001). Curriculum including these topics should continue to be taught.

In addition, the graduates perceived they delivered more services to their clients *after* the training than they did *before*, including more demonstrations and group discussions (see Table 8), which exemplify principles of social constructivism (Navarro, 2008; Fevre et al., 1999). Demonstrations are also a form of "observational learning," as described by Knobloch (2003). Owens et al. (2001), from results obtained describing SAFE training in Ghana, found "highly significant [differences between] pre and post training job performance competencies" (p. 4). The competencies Owens et al. (2001) identified as being *capital* to the job performance of extension educators in SSA also included demonstrations and group discussions with clients.

In this study, however, the graduates' interactions with input dealers or traders, i.e., representatives of market forces, changed less substantially *after* their SAFE training when compared to that of exchanges with clients (see Table 8). These findings should be explored, considering the potential that extension professionals hold for linking farmers to other actors in the value chain system (Akeredolu, 2008). In an era of pluralistic extension services, extension practitioners should be skillful enough to assist in making these connections. To this end, Swanson (2008) explained, "[it] should be noted that there is growing recognition that markets, not technology, have become the primary driver for agricultural development in many countries" (p. ix). Based on Swanson's (2008) assertion, SAFE officials should ensure their training program prepares graduates to link farmers to the stakeholders and actors who augment the agricultural value chains in Mali. In accord with this recommendation, SAFE officials have revised their training curriculum to be more value chain-oriented and are considering other related changes to their program (Akeredolu, Annor-Frempong, & Kanté, 2012; SAFE, 2013).

Beginning with its inception in 1993, the SAFE training program for mid-career extension professionals has been established in nine African countries (SAFE, 2013). However, before this study, only rather limited assessments were conducted on the training in Mali. This study, therefore, serves to inform SAFE officials about the training's primary output, its graduates, and gain some measure of the training program's *outcomes* (Hoffman & Grabowski, 2004) based on the graduates' perceptions of their impact on clients' behaviors. Nonetheless, impact studies with the graduates' clients should be a priority for future research.

The findings of this study support and, in some cases, complement existing information about the accomplishments and challenges of the SAFE training program in SSA (e.g., Deola, 1999; Duo & Bruening, 2007; Kabutha, 2007; Knipsheer, 1999; Kroma, 2003; Mutimba, 2003; Owens et al., 2001; SAFE, 2013) with particular relevance to Mali. Other researchers, as well as practitioners, may draw on aspects of this study when planning future investigations or if designing similar training programs. This

study revealed that the graduates benefited through job advancement and that graduates perceived the training helped them to address some of their clients' problems. The value proposition of human capital theory, i.e., that education is an important investment in people who stand to generate economic benefits for society (Sweetland, 1996), was supported by the results of this study. Moreover, the findings of this assessment can be used for comparison purposes with future evaluations in the SAFE training network across SSA.

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