

FARMERS' OPINIONS ABOUT LIFELONG LEARNING IN ANIMAL PRODUCTION

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ABSTRACT: *Learning is like rowing upstream, not advancing is dropping back. Lifelong learning activities for livestock and poultry farmers play an important role in the industry. This study analyzed animal farmers' attitudes towards lifelong learning in Taiwan. Data were collected with structured and validated questionnaires from 798 farmers. Data obtained from the questionnaires were analyzed using SAS. Results indicated that respondents were mainly employees on animal farms (38.7%); 29.1% were farm owners and owners' wives. More than half of the respondents' work experience was above 6 years (57.4%); the majority were male (85%); nearly one third (32%) were 25-34 years old; two thirds (66.7%) had university or graduate degrees. Respondents (92.4%) thought farmers should also have lifelong learning plan. Most respondents (87.2%) thought the future of animal production was positive. This research revealed that farmers had very high motivation about lifelong learning activities. Unexpectedly, employees expressed a higher understanding about lifelong learning than owners and owners' wives. The higher the educational level respondents had, the more agreeable they were to lifelong learning. Lifelong learning believers expressed higher motivation in non-formal and informal learning activities than non-believers. Positive learners expressed enhanced competency and confidence, in turn motivating them to learn. Policymakers and practitioners should open up access to knowledge for everyone, encourage and promote relevant advanced conferences, hands-on training programs, and non-formal and informal learning activities for farmers.*

KEYWORDS: animal production, farmer, learning, extension education, motivation

INTRODUCTION

Learning is like rowing upstream, not advancing is dropping back. This old Chinese proverb expresses the wisdom of learning and is still true nowadays. In times of rapid technological innovation and change, continuous learning is the only way to keep up with the pace of advanced knowledge. As the famous Western proverb goes from Francis Bacon, knowledge is power. A man of knowledge enhances his skills and competency in his work; he then will improve his efficiency and gain wealth eventually.

To feed the world's growing population, the Food and Agriculture Organization (FAO) of the United Nations reported that there is a need to increase agricultural and food production by 60 percent above 2005/07 levels to meet future food demand by 2050

(Alexandratos and Bruinsma 2012). Agriculture is an essential sector for sustainable development and poverty reduction in developing countries. According to Timmer and Akkus (2008), no country can sustain a rapid transition out of poverty without raising agricultural productivity. To raise agricultural and food production relies on enhancing the use of modern technology and approaches. Along with the global demands in quality and quantity of animal production, the animal industry should also make improvements to meet those needs. There is no shortcut leading to good quality and quantity in animal production; only continuous learning put into practice does.

Extension education for farmers is crucial to the improvement of agricultural productivity. It is a type of lifelong learning in adult education. The European Commission has defined lifelong learning as all learning undertaken throughout life, with the aim of improving knowledge, skills, and competence (CEC 2000). Lifelong learning activities for livestock and poultry farmers play an important role in the industry. Even though animal production brings prosperity and wealth to the countryside, agricultural extension education is seldom emphasized. There is also very little research on animal farmers' learning. Castleberry et al. (2019) describe how building a lifelong-learning habit provides fertile soil within which creative ideas and innovative solutions grow. The benefits of lifelong learning are helping practitioners to adapt to change, having a bigger paycheck, and enjoying an enriching and fulfilling life (Laal and Salamati 2012).

In a Memorandum on Lifelong Learning (CEC 2000), there are three basic categories of purposeful learning activity: formal learning, non-formal learning, and informal learning. Formal learning takes place in education and training institutions, leading to recognized diplomas and qualifications. Non-formal learning takes place alongside the mainstream systems of education and training and does not typically lead to formalized certificates. Informal learning is a natural accompaniment to everyday life. Generally, research in farmers' learning will include non-formal and informal learning. Non-formal learning provides the farmer hands-on training and better methods of farming, and informal learning keeps the farmer abreast with changing innovation and ideas and allows him to share experience gained (Eric et al. 2014). A Dutch study revealed that the top 10 learning preferences for the agri-food sector did not include any formal learning simply because of lack of time; non-formal and informal learning activities prevailed, such as conferences, extension, and professional journals (Lans et al. 2004). However, information on animal farmers' learning is uncommon in Taiwan; therefore, whether people have the same viewpoints on learning among different positions and different education levels is unclear. Hence, this study was designed to identify farmers' perception about lifelong learning to raise awareness and provide a fundamental reference for their learning needs for policymakers and practitioners.

MATERIALS AND METHODS

This study was an exploratory study, using a questionnaire approach. The subject of the questionnaire was to examine the needs of lifelong learning in the animal industry in Taiwan. During animal production conferences and training courses organized by the Animal Division of Innovation and Practical Training Center of National Pingtung

University of Science and Technology, questionnaires were distributed to the participants to be completed. The survey responses were anonymous. A 6-point Likert scale was employed to determine opinions about learning activities by farmers. Each question offered six options, from 1 (indicating strongly disagree), 2, 3, 4, 5, to 6 (indicating strongly agree). Subjects gave single answers to better quantify the problem. The questionnaire was divided into three main parts. The first part related to participants' socio-demographics. The second part referred to participants' lifelong learning needs. The last part comprised 20 questions to ask participants about attitudes towards different types of learning. Some items of learning were taken from the literature, and some were developed according to the correspondent author's experience in agricultural education and extension. Questionnaire data were analyzed using the general linear model procedure (GLM) in SAS (2004) for analysis of variance, and Duncan's new multiple range test was used to compare differences among the means.

RESULTS AND DISCUSSION

A total of 1,388 questionnaires were issued and 838 were returned, for a recovery rate of 60.4%, of which 40 were voided due to more than half of the questions being unanswered; therefore, 798 questionnaires were accepted with an adjusted response rate of 57.5%. The socioeconomic characteristics of the respondents were as follows. Respondents were mainly employees on animal farms (38.7%), while 29.1% were farm owners and owners' wives. More than half (57.4%) of the respondents' work experience was above 6 years. Respondents' working time on animal farms was mainly 4-8 hours per day (41%), followed by 9-12 hours per day (25.2%). Most respondents were male (85%). Nearly one third (32%) of respondents' ages were 25-34 years old, followed by 35-44 years old (23.7%) and 45-54 years old (21.2%). Two thirds (66.7%) of respondents' education levels were university or graduate.

In Taiwan, the Lifelong Learning Act was issued in 2002. This Act makes clear its purpose from the very beginning: "This Act has been formulated to encourage lifelong learning, implement and promote lifelong education, strengthen social education, advance learning opportunities, and enhance people's literacy, understanding, knowledge, and skills." As far back as 1994, the European Commission proclaimed 1996 as the European Year of Lifelong Learning in order to make the European public aware of how crucially important education and training are to successfully integrate into society and the labor market (EC 1994). In this study, 72.3% of respondents had heard about and understood the meaning of lifelong learning. Almost 60% of respondents knew the lifelong learning system for government employees or business people, and the majority of respondents (92.4%) thought farmers should also have this kind of lifelong learning system (Table 1). Their learning desire was quite high. Through learning one accumulates knowledge and beliefs, and in turn, knowledge and beliefs determine attitude. Attitude is everything; the stronger the attitude the more it should affect behavior. Table 2 further revealed that most respondents (87.2%) thought animal production was a profitable enterprise; it had a great future. The dissemination of lifelong learning activities should be accelerated to take advantage of a positive attitude and beliefs by changing and enhancing their mindset toward adopting modern technology and approaches in animal production. For instance, Malaysian researchers

reported that farmers gained a positive attitude and intention to adopt organic farming (Ashari Sharifuddin et al. 2018); Australian researchers demonstrated that positive attitudes and management behavior improved animal welfare (Munoz et al. 2019).

Table 1 Perceptions on lifelong learning

Perceptions on lifelong learning	Category	Frequency	Percentage (%)
Have heard about lifelong learning and understand its meaning	Yes	577	72.3
	No	210	26.3
	Missing data	11	1.4
	Total	798	100
Know the system of lifelong learning implemented in government and business	Yes	477	59.8
	No	302	37.8
	Missing data	19	2.4
	Total	798	100
Animal industry sector also needs lifelong learning	Yes	737	92.4
	No	45	5.6
	Missing data	16	2.0
	Total	798	100

Table 2 Opinion about future of animal production

Confidence in animal production	Category	Frequency	Percentage (%)
There is a bright future in animal production.	Yes	696	87.2
	No	59	7.4
	Missing data	43	5.4
	Total	798	100

Compared with owners, owners' wives, and employees of farms, other respondents in the study revealed that technical persons, teachers, and students related to the animal industry showed the deepest understanding about lifelong learning ($p < 0.05$) and knew about the system implemented by the government and business sectors ($p < 0.05$). It is normal that technical persons, teachers, and students express the deepest understanding of lifelong learning. Owners and owners' wives should be active in lifelong learning when running their businesses, but the truth is different. Interestingly, compared with employers, employees showed a deeper understanding about lifelong learning. This might be due to their caring about their future and trying to pursue better performance. As regards to whether lifelong learning is needed in the animal industry sector, all of them were also highly agreeable to this issue (Table 3). A successful farm relies on good-quality employees. Learning activities can benefit employees and farm/organization. This can be seen in many reports (Von Münchhausen and Häring 2012; Jehanzeb and Bashir 2013; Nda and Fard 2013). These studies concluded that training and development programs would upgrade not only the productivity of employees but also that the farm/company would remain competitive in the market/industry.

Table 3 Opinions of different positions of animal production workers on lifelong learning

Description	Owner	Owner's wife	Employee	Others	SEM	Sig.
Have you heard about lifelong learning and understand its meaning? (1= Yes; 2= No)	1.33 ^a	1.41 ^a	1.28 ^{ab}	1.15 ^b	0.05	*
Do you know government agencies and entrepreneurs have a lifelong learning system? (1= Yes; 2= No)	1.50 ^a	1.59 ^a	1.43 ^{ab}	1.26 ^b	0.06	*
Do you think a lifelong learning system is also needed in the animal industry sector? (1= Yes; 2= No)	1.10 ^a	1.00 ^b	1.06 ^{ab}	1.01 ^{ab}	0.03	*

^{a, b}: Means within the same row without the same superscripts differ significantly

SEM: Standard error of mean

Sig.: *: $p < 0.05$

A World Bank's research report (Jamison and Lau 1982) explored the relationship between farmers' education and their subsequent efficiency as farm operators. The research used data from Korea, Malaysia, and Thailand. It revealed that more educated farmers did have higher levels of profits, which reflected the higher levels of productivity found in their production function analyses. The effects of education were much more likely to be positive in modernizing agricultural environments rather than in traditional ones. Indian research (Paltasingh and Goyari 2018) demonstrated that education enhanced farm productivity in the case of adopters of modern technology. Table 4 reveals that the higher the educational level of respondents, the more agreeable they are to lifelong learning, especially those with graduate and above education ($p < 0.001$). This agreed to some researchers' results that the highly educated tend to participate more in learning activities (Hamil-Luker and Uhlenberg 2002; Alfageme 2007; Villar and Celdrán 2013). Respondents with primary school and junior high school levels of education were less aware of lifelong learning. This might be due to their having lower levels of reading comprehension, lack of prior knowledge, lack of proficiency in computer literacy, or inferior or arrogant feelings resulting in less access to extension education. Education will change farmers' behavior and it is important for the improvement of agricultural productivity. Some researchers concluded that farmers with an agricultural college or university degree would seek professional assistance, use extension services, and use formal or informal sources of information (Fearne and Ritson 1989; Corcoran and Dent 1994; Bryden 1997).

Table 4 Opinions of different educational backgrounds of animal production workers on lifelong learning

Description	Primary school	Junior high school	Senior high school	University	Graduate and above	SEM	Sig.
Have you heard about lifelong learning and understand its meaning? (1= Yes; 2= No)	1.67 ^a	1.64 ^a	1.35 ^b	1.25 ^b	1.14 ^b	0.09	***
Do you know government agencies and entrepreneurs have a lifelong learning system? (1= Yes; 2= No)	1.83 ^a	1.85 ^a	1.50 ^b	1.38 ^b	1.30 ^b	0.09	***
Do you think a lifelong learning system is also needed in the animal industry sector? (1= Yes; 2= No)	1.17	1.14	1.07	1.05	1.03	0.05	NS

^{a, b}: Means within the same row without the same superscripts differ significantly

SEM: Standard error of mean

Sig.: NS: $p > 0.05$; ***: $p < 0.001$

People considered animal production workers should also have lifelong learning they expressed higher motivation in non-formal learning activities (Table 5). They agreed that attending a 5-day field training session ($p < 0.05$) and 1-3 conferences per year ($p < 0.05$) were necessary. They agreed that taking university courses ($p < 0.05$) and distance learning courses by computer ($p < 0.05$) were helpful. Besides, they also expressed higher motivation in informal learning activities. They would spend at least 2 hours per week to read books ($p < 0.05$) and review course contents at night ($p < 0.01$). When encountering problems, they would discuss with friends ($p < 0.05$), read textbooks ($p < 0.05$) or magazines ($p < 0.05$), search the Internet in Chinese, or look for answers in libraries or bookstores to solve problems ($p < 0.05$). Surprisingly, those who thought animal production did not need lifelong learning expressed less learning desire. They were not positive about attending extension programs nor willing to read books or magazines. They did not even actively look for support from friends or experts when encountering problems. Lifelong learning believers always held a more positive attitude about learning activities and problem solving matters than non-believers. In this study, due to language barriers, neither group was agreeable to searching the Internet in English to solve problems. How to motivate farmers to learn English is another issue. Besides, extensionists and government agencies should try to translate and transmit advanced knowledge and skills as soon as possible to enhance the industry.

Table 5 Relationship between having lifelong learning (LLL) for animal production workers and learning desire, based on a six-point Likert scale

	No need		SEM	Sig.
	Need LLL	LLL		
Attending 5-day field training is necessary	4.61 ^a	3.84 ^b	0.19	*
Attending 1-3 conferences per year is necessary	5.27 ^a	4.80 ^b	0.15	*
Inviting professionals to farm is necessary	4.82	4.40	0.19	NS
Taking courses in university is helpful (non-degree)	4.68 ^a	3.96 ^b	0.17	*
Distance learning through computer is helpful	4.40 ^a	3.84 ^b	0.18	*
Spending at least 2 hours per week to read books	4.99 ^a	4.56 ^b	0.15	*
Reviewing course after seminar or training course	4.93	4.52	0.15	NS
Reviewing course at night during training period	4.42 ^a	3.68 ^b	0.16	**
Searching for information to resolve problems	5.26	5.00	0.13	NS
Encountering fewer problems in work	3.26	3.68	0.20	NS
Discussing with friends first to resolve problems	4.73 ^a	4.20 ^b	0.17	*
Reading textbooks first to resolve problems	4.56 ^a	3.88 ^b	0.17	*
Reading magazines first to resolve problems	4.04 ^a	3.40 ^b	0.19	*
Looking for experts first to resolve problems	4.90	4.76	0.16	NS
Thinking first to resolve problems	4.63	4.40	0.17	NS
Having at least 5 reference books (not magazines)	4.38	4.00	0.21	NS
Having at least 1 magazine on animal production	4.69	4.20	0.23	NS
Searching Internet in Chinese to resolve problems	4.69 ^a	3.96 ^b	0.19	*
Searching Internet in English to resolve problems	2.70	2.60	0.21	NS
Looking for answers in library or bookstore	3.50 ^a	2.88 ^b	0.22	*

^{a, b}: Means within the same row without the same superscripts differ significantly.

SEM: Standard error of mean.

Sig.: NS: $p > 0.05$; *: $p < 0.05$; **: $p < 0.01$.

CONCLUSIONS

Laal (2011) stated that if countries are to see lifelong learning develop further, then the patterns of behavior of everyone in the industry needs to change, including employee individuals, employers, and the providers of learning and qualifications. This research showed that the farmers had very high motivation in lifelong learning. The higher the educational level of respondents, the more agreeable to lifelong learning they were. Lifelong learning believers expressed higher motivation in non-formal and informal learning activities. Though the direct benefits of lifelong learning were not investigated in this study, it can be seen how the positive respondents gained profit in knowledge and skills through learning, and were full of hope for the future of the animal industry. This confidence in animal production motivated them to learn, and thus became a

positive cycle. Policymakers and practitioners should open up access to knowledge for everyone, especially for employers and those with lower education levels as well as encourage and promote work-related advanced conferences, hands-on training programs, and non-formal and informal learning activities for farmers.

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