
Developing agricultural knowledge and skills by using a learning kit on commercial native chicken rearing of agricultural teacher apprentice students, Surindra Rajabhat University

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Abstract According to the comprehensive development of agricultural knowledge and skills of the agricultural teacher apprentice students, it was developed as a new agricultural learning kit which was consistent with learning era in the 21st century and the digital age. Results was showb to be 3 parts. Firstly, five components gained from the learning kid development as building a chicken house and appropriate equipment preparation, management of native chicken rearing, management of waste utilization, processing and distribution management and preparing online media for learning. The learning kid assessment showed very high level (\bar{x} =4.36; S.D.=0.165). Secondly, four mouths resulted of 100 native chicken rearing that caged chicken rearing gave higher survival rate than free-range rearing with a statistical significance level at P=0.05. However, there was not statistical significantly differed at P=0.05 in terms of food cost, food intake, weight gain, food conversation ratio, return per head, net profit per head, the return on weight gain, production loss index, and production efficiency throughout the experiment. Thirdly, development of agricultural knowledge and skills increased in learning achievement at a significance level at P=0.01. As a whole, the assessment of native chicken rearing was found at a high level (\bar{x} =4.43; S.D.=0.178). Based on results, the management of native chicken rearing was found at highest level (\bar{x} =4.68 S.D.=0.125) and followed by skills in processing and distribution (\bar{x} =4.35 S.D.=0.136) and online media preparing (\bar{x} =4.23 S.D.=0.142). The confidence in the adoption of knowledge and skills in teaching native chicken rearing were found at highest level (\bar{x} =4.58 S.D.=0.185). It is suggested that a mixed farming learning kit and a learning kit through online systems should be developed for a highest efficiency.

Keywords: Agricultural knowledge and skills, Native chicken rearing, Caged chicken rearing, Free-range chicken rearing, Learning achievement

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Introduction

At present, the world is progressive rapidly due to use of advanced technology for connecting various data of all regions of the world. The social transformation trend in the 21st century has affected on way of society life at all levels including educational facilitation. Hence, the teacher must be alerted and to facilitate for teaching / learning skills in various subjects for students. This is concerned in particularly skill for agriculture teachers needed for learning development and knowledge transfer in the 21st century. As a matter of fact, learning skills result in the transformation of learning facilitation in order to make students acquire knowledge and necessary skills (Thongnoppakhun, 2019, Thanormchayathawat *et al.*, 2016). Nowadays, there are various forms of educational facilitation to make the learning facilitation process to be effectively successful aimed. Importantly, the teacher must have many teaching method and media to encourage for learning. The media can be well created for learning to the learner who learning media or learning activities sets (Sunthornprasert, 2001). The learning activity set is a type of media which concerning a specific purpose to be investigated. Thus, it is needed innovative use of mixed teaching media by integrating multiple media systems. Besides, teaching media is created by the teacher who comprised in many kinds of equipments and other components. It aimed to make the learner practices in activities and is acquired knowledge by himself with suggestions from the teachers.

Interestingly, psychological principles are teaching and learning to promote for successful teaching/learning facilitation. The study aimed to learn the activities set for commercial native chicken to develop agriculture knowledge and skills of agricultural teacher to students at Surindra Rajabhat University. It was to ensure that they would be able to use their knowledge and skills for teaching in agriculture and native chicken rearing.

Materials and methods

The study was combined between the educational research (agricultural learning activities set) and a comparative research on the rearing patterns of native chickens for agricultural teacher to apprentice students.

The development of the agricultural learning activities set

It comprised 5 parts as an appropriate native chicken house construction and equipment preparation (1), management of native chicken rearing (2),

waste management to benefit (3), management of processing and distribution (4) and preparing online media for learning (5). The sample group consisted of 47 out of 150 students were obtained by purposive sampling.

Group pretest and posttest design were employed. The research tools were organic agricultural factors for conversing the households during the COVID – 19 pandemics, learning achievement test, behavioral observation form, and questionnaires. The teaching / learning facilitation on native chicken rearing were recorded for 4 months. It was done under theories of creation of knowledge using, teaching, predicting, observing and explaining as Predict Observe Explain (POE) which followed the method of Torpop (2013) and recorded for Blended Learning (B). The students were used smartphone in communication together with Line and Facebook (Carman, 2005, Petsangri, 2012). Index of Item objective congruence (IOC) was considered by 5 scholars for finding classification power, difficulty and reliability. The experiment was conducted with a non - student sample group.

One hundred native chickens were recorded for 4 months to compare confinement rearing with free-range rearing based on growth performance.

The equipment and experimental method were used as one day old native chicks, assorted genclens, separated into 2 treatments (confinement rearing and free-range rearing). The experiment was done with 4 repetitions with 12 treatments in a total of 96 native chickens.

Animal feed for chicken age of 1-6 weeks was mixed with the required protein level of 18 % with computed by Pearson's square method. The chicken age of 6-12 weeks was fed the native chicken feed according to the commercial formula.

The native chickens were vaccinated according to the program to record data. Daily feed intake (DFI) was calculated for feeding through the experiment. Data were collected every week for body weight gain (BWG), feed conversion ratio (FCR), feed cost, survival rate, salable bird (NRB), feed cost per gain (FCG), economic loss index (ELI) and production index (PI).

Assessment of the development of agricultural knowledge, skills and satisfaction for learning achievement test before and after learning

Data were obtained and analyzed using frequency percentage, mean, standard deviation and t-test (Dependent samples). Data were interpreted as opinion and satisfaction by using 5-rating scales and the interpretation criteria followed the method of Roengprapan (2000) as follows:

$$\frac{\text{Highest criterion} - \text{Lowest criterion}}{\text{All criteria}} = \frac{5-1}{5} = 0.80$$

5–rating scales were recorded as follows:

Score	Scale limits	Descriptive
5	4.21-5.00	Highest
4	3.41-4.20	High
3	2.61-3.40	Moderate
2	1.81-2.60	Low
1	1.50-1.80	Lowest

Results

The learning activities set was explained with the students for practicing agricultural activities on native chicken rearing. It was shown to be appropriated for chicken house construction and equipment preparation eg management native chicken rearing, waste management, management of processing and distribution and preparing online media for learning. It was found that the learning activities set was very good with the highest level (\bar{x} =4.36; S.D.=0.165). Results showed that native chicken rearing for 4 months that compared as in Table 1.

Table 1. A comparison of native chicken rearing patterns per performance of native chicken production

Production performance	Confinement	Free - range	P - value
- Daily feed intake	4,390.9 ±20.99	4,400.2 ±29.00	NS
- Body weight gain	836.2 ±36.00	845.00 ±37.00	NS
- Feed conversion ratio	5.27 ±3.15	5.23 ±3.40	NS
- Feed cost	84.70 ±28.70	83.60 ±27.00	NS
- Survival rate (%)	94.00 ±25.00	87.00 ±25.00	*
- Salable bird return	66.00 ±22.00	65.66 ±22.00	NS
- Net profit return per bird	19.21 ±21.33	18.86 ±21.55	NS
- The return on weight gain	0.42 ±4.99	0.45 ±6.00	NS
- Economic loss index ²	14.05 ±6.00	14.05 ±6.01	NS
- Production index	171 ±8.99	167 ±9.70	NS

Alive selling price = 75 bath/Kg.; ²feed cost = 0 – 6 weeks old; feed cost per kg = 16 bath; G–12 weeks old feed cost = 15 bath economic loss index = aleight gain × survival rate ÷ feed conversion ratio × 10³; production index formula = survival rate × weight gain ÷ (rearing day × feed conversion ration); = difference NS = not statistically significant difference (p>0.05).

Learning achievement of the sample group measured using pre- and post–tests were recorded to be consistent with the learning content of the agricultural

learning activities set. The comparison of learning achievement was shown in Table 2.

Table 2. A number of students, average mean score, standard deviation, pretest/posttest scores, t-test values and statistical significance level

Item	No. of student	\bar{x}	S.D.	t	Sig.
Before	47	28.35	5.437	18.037	0.000*
After	47	44.59	4.165		

*Statistical significance level at 0.01

Result showed statistically difference at $P=0.01$ in averaged mean score of pre- and post-tests ($\bar{x}=28.35$; S.D.=5.437 and $\bar{x} = 44.59$; S.D.=4.165). It is concluded that the agricultural learning activities set was affected to develop for learning achievement of the students (Table 3). The student satisfaction with agricultural knowledge and skills development after using the agricultural learning activities set was shown in Table 3.

Table 3. Satisfaction with agricultural knowledge and skill development activities of the sample group with a learning set on commercial native chicken rearing

Item	\bar{x}	S.D.	Description
-Management of native chickens rearing	4.68	0.125	Highest
-Building and preparing native chicken houses	4.20	0.147	High
-Skills in use of native chicken rearing equipment	4.18	0.150	High
-Incubation and vaccination of native chickens	4.17	0.151	High
-Chicken feed and feeding	4.19	0.149	High
-Poultry disease sanitation	4.14	0.154	High
-Packaging and delivery of goods to consumers	4.15	0.153	High
-Outline marketing and and pre-order	4.21	0.148	High
-Waste management to benefit	4.20	0.147	High
-Skills in processing and distribution of produce	4.35	0.136	Highest
-Preparing online media for teaching/learning	4.23	0.147	High
-Satisfaction with the development of knowledge and skills in native chicken rearing as a whole	4.65	0.142	Highest
Average total	4.19	0.463	High

The sample group was satisfied with the development of agricultural knowledge and skills in native chicken rearing at a high level ($\bar{x} = 4.19$; S.D.=0.463). It was found to be a high level for managing native chicken rearing ($\bar{x} = 4.68$; S.D.=0.125), satisfaction with the development of knowledge and skills

in native chicken rearing ($\bar{x}=4.65$; S.D.=0.142) and skills in processing and distribution of produce ($\bar{x} = 4.35$; S.D.=0.1326). The sample group was shown to be adopted these knowledge and skills in agricultural teaching particularly in native chicken rearing. It was successfully developed the learning activities set through online learning system and blended learning in Urban Agriculture subject to achieve a highest efficiency.

Discussion

Development of agricultural knowledge and skills of agricultural teacher apprentice students are important factors to develop on effective agriculture teachings/learning facilitation. Agricultural subject would be promoted the students to realize the importance of agricultural careers. In this study, the students were accepted to learn in agriculture. Theories and practical systematically knowledges are concerned in the classroom and in farms. In this respect, the learning activities set on commercial native chicken rearing was proved to develop agricultural knowledge and skills of students. It reached to be appropriated for building the native chicken rearing house and equipment preparation. Then, it is needed to manage the native chicken rearing, waste management, processing and management and preparation of online media for learning. It was found that the learning activities set would help the students to be better learning achievement than before learning. It is also explained by Ritsongmoeng *et al.* (2018) who found that using a learning activity sets as meat poultry production with blended learning helped students to improve their learning achievement. It is particularly concerned in the skill practice which can help the students to memorize academic knowledge (Klompanya *et al.* 2018, Pongsuk, 2019). Besides, systematic agriculture is practiced by suggestions of the teacher would improve agricultural knowledge/skills of agricultural teacher (Srisuwan *et al.*, 2019).

During 4 months of systematic native chicken rearing practice was done with using the learning activities set, the student sample group was clearly developed in agricultural knowledge / skills. It was found that 100 native chicken rearing gave a better production and quality than free-range rearing patterns. It implies that the learning activities set could develop the skills in native chicken rearing. Besides, it is found that chicken confinement rearing had a higher survival rate than free range rearing patterns. Both patterns of rearing were similar to report of Choprakarn *et al.* (2000). Moreover, Pathon *et al.* (2002) reported that hybrid native chickens in the free-range pattern were found to be higher feed rate but its feed conversion ratio was lower than confinement (Witabot, 2018). However, the native chicken rearing with systematic teaching/learning facilitation could develop the potential of the

student for their learning achievement. It denoted that the learning activities set was truly improved in agricultural knowledge / skills. Besides, the student sample group were confidentially adopted their knowledge/skills in teaching native chicken rearing. It was in consistent with reports of Injana *et al.* (2019), Pongsuk (2019) and Panyakham (2018) who found that skillful students would be concerned to confident for transferring their knowledge/skills to others.

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