

ORIGINAL ARTICLE

A Study on the Development of Fruit Tree Experience Programs Based on User Segmentation

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Abstract

Fruit trees are a key part of agriculture in rural areas and have recently been a part of ecotourism or agrotourism. This study analyzes user segmentation based on user motivation to determine characteristics of potential customers in fruit tree farms, and thereby develop fruit tree experience and educational programs. We conducted a survey of 253 potential customers of fruit tree experience programs in September 2017. Data were evaluated using factor and cluster analyses. The results of the cluster analysis identified four distinct segments based on potential customers' motivations, that is, activity-oriented, learning-oriented, leisure-oriented, and purchase-oriented. These clusters showed that significant differences in the preference of potential customers exist. Different markets were segmented based on the benefits sought by users. The segments' characteristics were identified and activities relevant to each segment were proposed for rural tourism. Lastly, this study suggests directions for development of fruit tree farm experience and educational programs.

Key words : Fruit tree, Experience program, Motivation, User Segmentation

1. Introduction

As national income levels rise, demand for leisure activities, including sustainable rural tourism, also increases (Lee et al., 2006). According to a Korea Rural Economic Institute report, the scale of rural tourism market has continued its growth (in KRW billion) from 92.6 in 2003, to 102.4 in 2004, to 181.4 in 2009, to 288.5 in 2011 (Kim and Park, 2013). Rural tourism includes rural visits where city

dwellers enjoy the nature, culture, agriculture, and environment of rural areas. Rural tourism offers an alternative income source for rural residents and is also relaxing for urban citizens. Thus, there is a need to preserve and develop various rural resources for rural tourism.

More people are interested in returning to farming and rural life according to 2014 statistics from the Ministry of Agriculture, Food, and Rural Affairs. Indeed, 33,442 households (61,991 people) returned

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to rural life in 2014, an increase of 55.5% from the previous year (22,501 households). Households returning to farming reached 11,144 (18,864 people), and these households had high interest in value-added farming.

The most common crops farmed included vegetables (43.5%) and fruit trees (33.8%) (National Statistical Office, 2015). Fruit trees are an integral part of the cultivation, production, distribution, and the educational facets of tourism, and should be better utilized in rural tourism. These trees have been known in Korea for centuries (Dynasty of Chosun).

Fruit trees are cultivated on about 300 farms in Korea. Only a few of these farms offer tourism, and this is seasonal. Rural tourism expansion is expected to save farm labor and increase profits. Year-round tours are likely to stimulate rural tourism and increase sales.

A prior study suggested that 80:20 is the proper ratio between practice and theory for the development of urban farming (Kwon and Lee, 2014). The goal here is a survey of domestic fruit tree farms to understand the practical nature of their farming and tourism practices. Previous studies were mainly based on the actual operation status and did not sufficiently explore rural tourism (Jang et al., 2011). As such, this study takes a holistic view to assess the potential tourism market.

Accordingly, this study analyzes user segmentation and proposes fruit tree experience and educational programs. These programs are based on the characteristics of potential tourists. This study also provides guidance in the development of fruit tree farm experience and educational programs to create value-added tourism as a 6th industry in Korea.

2. Method

2.1. Research Tool

In this study, we classified fruit tree data from 314

farms nationwide with reference to the National Gardening Research Center, Agricultural Technology Center, and an internet based survey. We visited 22 farms in Gyeonggi-do from May 1 to December 31, 2016 to research the farm, fruit tree cultivation, and management methods. The farms were distributed as follows: 118 (38%) in Gyeongsang-do, 62 (20%) in Chungcheong-do, 61 (19%) in Gyeonggi-do, 55 (18%) in Jeolla-do, and 18 (6%) in Gangwon-do.

There were 33 kinds of fruit trees covered in this study including persimmon, Chinese matrimony vine, guava, tangerine, *Cudrania tricuspidata*, jujube, mango, plum, wild grape, fig, chestnut, pear, bo tree, raspberry, peach, blackberry, blueberry, apple, apricot, pomegranate, aronia, asai berry, cherry, mulberry, schizandra, dragon fruit, citron, ginkgo, plum, kiwi, cherry, grape and hanrabong. Jeolla-do had 20 types, Gyeongsang-do had 20 types, Chungcheong-do had 18 types, Gyeonggi-do had 16 kinds, and Gangwon-do had 11. The most common fruit trees were pear, blueberry, apple, plum, and grape. Tangerine, guava, mango, dragon fruit, and hanrabong were grown inland. This survey was conducted to develop a general experience program that could be used on most fruit farms. For the 33 kinds of fruit trees, the research tools evaluated the experience program of fruit tree farms, the motivation of farm experience activity participation, the experience and educational program preference utilizing fruit trees, the preference of this experience and educational program, and the interest and preference about fruit tree cultivation based on the researched contents (Table 1). A participant's motivation serves as the foundation in explaining his or her behavior. This has an inseparable relationship with the participation motif and is directly or indirectly connected to the decision maker's desire (Kim, 1994).

Motivation is the psychological driving force underlying a participant's behavior. It is a desire for

Table 1. Contents of questionnaire

Division	Question and source	Scale
Preference for the use of program	Kind of fruit tree, season, participation frequency, people with whom want to share the experience, participation period	Nominal scale
Purpose (motif) of experience and education program participation	Fodness (1994), Lee (2006), Lee and Jung (2009), Park and Lee(2011)	
Preference of fruit tree experience and education program	Experience program operated in the actual fruit tree farm The programs in relation to harvest and cultivation of fruit trees	5-point Likert scale
Preference of experience and education program other than fruit tree	Experience program operated in the actual fruit tree farm Related experience programs other than fruit tree	
Demographic information	Age, sex, occupation, occupation, monthly income, final education	Nominal scale

experience—the psychological energy that induces participation in the experience (Park and Lee, 2011). Accordingly, this study designed the research tool (in relation to the potential visitors' purpose of participation and motivation) based on a precedent study on fruit tree experience and educational programs. This survey tool was created using programs from a working fruit tree farm.

With regard to the question on preference experience and educational programs other than fruit trees, we used a 5-point Likert scale (1=do not like it at all, 5=I like it very much). For the question on the purpose and motif of program participation, we used a similar scale. We used a nominal scale to evaluate program use and demographics. We sent a survey on the completed research tool to 24 professionals to verify its reliability and feasibility.

2.2. Data collection

This survey was designed to understand the potential customers of the fruit tree experience program in the rural tourism market. The data was collected via an online survey of 456 citizens in September 2017. A total of 253 valid questionnaires (55.4% response rate) were obtained from potential customers of fruit tree experience programs.

2.3. Analysis method

Factor analysis, cluster analysis, frequency analysis, and one-way ANOVA were conducted

using the IBM SPSS Statistics 23 (SPSS Inc., 2016). Factor analysis and cluster analysis divided the demanders by type depending on the participation motif for the fruit tree garden. Variance analysis was used to draw differences from each question by demander type based on the results of factor and cluster analyses. Frequency analysis was used for question-specific statistics.

2.4. General information of respondents

General information on the potential customers for fruit tree experience programs in the sample is presented below. The respondents included 163 men (62.9%) and 96 women (37.1 %); their average age is 45.58 years. There were 198 married people (76.4%), and 60 single people (23.2%). The married people have 1.41 children on average. Among the respondents, 91 are experienced in fruit tree farms (20%) while 66 (25.5%) are involved in a garden-related industry. Housing data showed that 15 people (5.8%) live in multi-unit housing, 22 (8.5%) in detached houses, 14 (5.4%) in villas, 203 (78.4%) in apartments, and 5 (1.9%) in country houses.

3. Results

3.1. Characteristics of preference for experience program

The most common fruits were blueberry 39.5%, apple 27.6%, tangerine 25.9%, and grape 24.6%

Table 2. Ranks for preference of fruit tree experience program

Fruit tree	Number	Proportion	Fruit tree	Number	Percentage
Blueberry	90	39.47	Pear	29	12.72
Apple	63	27.63	Pomegranate	26	11.40
Tangerine	59	25.88	Cherry	25	10.96
Grape	56	24.56	Mulberry	24	10.53
Cherry	54	23.68	Schizandra	24	10.53
Aronia	46	20.18	Wild grape	23	10.09
Peach	44	19.30	Kiwi	22	9.65
Hanrabong	41	17.98	Jujube	20	8.77
Mango	39	17.11	Apricot	16	7.02
Fig	38	16.67	Cudrania tricuspidata	15	6.58
Asai berry	38	16.67	Chinese matrimony vine	13	5.70
Persimmon	37	16.23	Citron	13	5.70
Raspberry	37	16.23	Dragon fruit	10	4.39
Chestnut	36	15.79	Guava	8	3.51
Black berry	36	15.79	Bo tree	6	2.63
plum	35	15.35	Gingko	1	0.44
Plum	35	15.35	228 respondents in total		

(Table 2).

The preferred tourism seasons are spring (30.9%), summer (5%), autumn (49.0%), and winter (13.4%). Some survey participants (13.4%) had no preferred season. People tended to take a romantic (72.2%) or family (17.7%) interest. Most of the respondents prefer a one-time short experience program (59.3%) rather than long-term experience and educational programs (40.7%).

Additionally, we characterized the program in terms of harvest, cultivation, and management; also in relation to experiences other than fruit trees (e.g., insect experience, play experience, and various other experiences). The most popular categories were fruit-harvesting ($m=3.96$), followed by food-preparation ($m=3.88$), and fruit tree cultivation ($m=3.44$). Other popular programs included food-making ($m=3.60$) and ecology educational programs ($m=3.37$).

3.2. Factor analysis for motivation

Next, we performed factor analysis using Varimax

to divide the demanders by type according to the motivation for experience and educational programs (Table 3). The eigenfactor value was 1.0, and the overall explanatory power was 76.03%. The suitability of the model is considered meaningful since KMO (Kaiser-Meyer-Olkin)=.889, Bartlett's Test of Sphericity, and Chi-square=3013.674 ($df=136$) are at 1% level. Five motivating factors were extracted including leisure, education, family ties, stress, and shopping. The level of consistency of questions forming each factor is determined to be suitable after confirming the value of Cronbach's Alpha (Table 3).

3.3. Cluster analysis for the motivation

Cluster analysis was conducted for the market sub division depending on the motif and purpose of participation. We tried to minimize the redundancy and similarity between each cluster to determine the proper number of clusters based on the factor scores of leisure, education, family ties, stress, and

Table 3. Factor analysis and reliability analysis for the motivation

Factor	Variables	Factor loading	Variance explanation power	Cronbach's Alpha
Leisure	To make memories	.817	25.251	.895
	To have fun	.806		
	To feel special feeling	.731		
	To escape from life routine	.688		
	To enjoy various outdoor recreation	.675		
	To enjoy leisure life	.674		
Education	To learn the technology of fruit tree cultivation	.948	15.274	.864
	To learn the technology of fruit tree management	.938		
	To cultivate the fruit tree in our garden	.691		
Family ties	To strengthen the family tie	.812	13.870	.880
	To have the common hobby between family member	.798		
	To spend the time with precious people	.673		
Relieve stress	To take a break simply	.851	13.821	.835
	To take psychological stability	.746		
	To relieve stress	.668		
Shopping	To purchase fruit trees	.730	7.813	.551
	To taste fruit trees	.636		

Extraction method: Principal component analysis.

Rotation method: Varimax with kaiser normalization. a

a. Rotation converged in 7 iterations.

shopping. We then conducted K-average cluster analysis based on the participation purpose (motif), classified them into four clusters, and subdivided them into 'activity oriented type (n=30)', 'learning oriented type (n=90)', 'leisure oriented type (n=64)', and 'purchase oriented type (n=69) (Table 4).

Each cluster of demographic characteristics

showed meaningful differences in sex, housing type, marital status, and number of children (Table 5). Men had a higher ratio in activity-oriented, learning-oriented, and purchase-oriented type clusters. In the housing type, the activity and learning-oriented types had a higher ratio of detached homes than the leisure or purchase-oriented types. The leisure type had fewer

Table 4. Results of cluster analysis

	Cluster				F	Sig.
	1 (n=30)	2(n=90)	3(n=64)	4(n=69)		
Leisure	-1.42304	-.27782	.69170	.35964	61.006	.000*
Education	.10089	.61042	-.26725	-.63641	30.597	.000*
Family tie	1.16089	-.64724	.39814	.01710	45.935	.000*
Relieve stress	.03768	.01643	-.44622	.37488	8.127	.000*
Shopping	.19850	-.06707	-.84576	.79051	46.026	.000*

*p<.05

Table 5. Demographic characteristics of the clusters

	Segment	Cluster 1.		Cluster 2.		Cluster 3.		Cluster4.		Total		
		Activity -oriented type		Learning -oriented type		Leisure -oriented type		Purchase -oriented type				
		n	%	n	%	n	%	n	%	n	%	
Gender	Male	19	65.5	69	77.5	40	62.5	30	44.8	158	63.5	=17.760 p=.000*
	Female	10	34.5	20	22.5	24	37.5	37	55.2	91	36.5	
Educational background	High school graduate	3	10.3	9	10.1	2	3.1	4	6.1	18	7.3	=12.955 p=.165
	In college	0	0.0	2	2.2	5	7.8	3	4.5	10	4.0	
	College graduate	15	51.7	55	61.8	31	48.4	31	47.0	132	53.2	
	Post-graduate degree	11	37.9	23	25.8	26	40.6	28	42.4	88	35.5	
Job	Civil servant	0	0.0	3	3.4	4	6.3	4	6.0	11	4.4	=35.257 p=.132
	Teacher (in relation with education)	6	20.7	9	10.1	5	7.8	5	7.5	25	10.0	
	Job searching/retirement	0	0.0	3	3.4	0	0.0	0	0.0	3	1.2	
	Agriculture	0	0.0	2	2.2	0	0.0	0	0.0	2	0.8	
	Business/self-employed	5	17.2	16	18.0	9	14.1	15	22.4	45	18.1	
	Service industry	3	10.3	7	7.9	4	6.3	5	7.5	19	7.6	
	Professional job	6	20.7	11	12.4	10	15.6	12	17.9	39	15.7	
	Housewife	0	0.0	8	9.0	47	6.3	4	6.0	16	6.4	
	Student	2	6.9	1	1.1	6	9.4	10	14.9	19	7.6	
Office worker	7	24.1	29	32.6	22	34.4	12	17.9	70	28.1		
Job related gardening	Yes	9	31.0	19	21.3	15	23.4	18	26.9	61	24.5	=1.389 p=.708
	No	20	69.0	70	78.7	49	76.6	49	73.1	188	75.5	
Housing type	Multiplex housing	1	3.4	5	5.6	2	3.1	5	7.5	13	5.2	=26.459 p=.009*
	Detached house	8	27.6	10	11.2	1	1.6	3	4.5	22	8.8	
	Villa	2	6.9	4	4.5	3	4.7	5	7.5	14	5.6	
	Apt	18	62.1	66	74.2	57	89.1	54	80.6	195	78.3	
Country house	0	0.0	4	4.5	1	1.6	0	0.0	5	2.0		
Marital status	Single	6	20.7	15	16.9	12	18.8	25	37.3	58	23.3	=10.2867 p=.016*
	Married	23	79.3	74	83.1	52	81.3	42	62.7	191	76.7	
Number of children	0	6	21.4	14	16.1	15	23.8	26	42.6	61	25.5	=24.891 p=.015*
	1	3	10.7	18	20.7	13	20.6	6	9.8	40	16.7	
	2	14	50.0	51	58.6	29	46.0	23	37.7	117	49.0	
	3	5	17.9	3	3.4	6	9.5	6	9.8	20	8.4	
	More than 4	0	0.0	1	1.1	0	0.0	0	0.0	1	0.4	

*p<.05

children than the other clusters.

There were differences between age groups in terms of preferred season and preferred time. The activity-oriented and learning-oriented types were

older than the purchase-oriented type. These clusters had more children. The learning-oriented type prefers to have more time than the other clusters.

Table 6. Factor analysis of preference for the fruit tree farm experience and education program

Factor	Variables	Factor loading	Variance explanation power	Cronbach's Alpha
Education learning program	Professional education program for the cultivation (fruit management etc.) of fruit trees	.910	42.917	.899
	Experience program of fruit tree management (weeding work, natural fertilizer making, etc.)	.894		
	Professional education program for the management of fruit trees	.892		
	Experience program of cultivation of fruit tree (fruit management) (fruit picking, bagging)	.721		
	Education and experience for my own fruit tree cultivation (annual basis, rental and parcel sales)	.639		
Harvest experience program	Food making using fruit tree (jam, sikhye, juice, etc.)	.897	28.909	.818
	Fruit harvest experience	.807		
	Making props using fruit tree (Postcards, key chains, crafts, etc.)	.704		

Extraction method: Principal component analysis.

Rotation method: Varimax with kaiser normalization.

a. Rotation converged in 7 iterations.

3.4. Preference of fruit tree farm experience and educational programs

We also studied preferences on fruit tree farm experience and educational programs and then analyzed the program-specific preference factors

(Table 6). Confirmatory factor analysis by Varimax showed an eigenvalue of 1.0. The suitability of the model was confirmed because KMO (Kaiser-Meyer-Olkin)=.815 and Chi-square of Bartlett's Test of Sphericity=1167.424 (df=28) showed 1%, which is

Table 7. Factor analysis of preference other experience and education program

Factor	Variables	Factor loading	Variance explanation power	Cronbach's Alpha
Education experience program	Various making experience (top, ceramics, etc.)	.823	31.538	.908
	Ecology education program (science classroom, etc.)	.788		
	Play experience (water play, stick toss play, etc.)	.722		
	General education program (English class, etc.)	.663		
	Food making(Rice cake, tofu, pepper paste, etc.)	.630		
Field herb farming program	Field farming (Potato harvest, pepper harvest, cucumber harvest etc)	.869	30.845	.840
	Herb picking (Dropwort, cucumbers, mugworts, etc.)	.840		
	Medicine herb picking (ginseng, codonopsis lanceolata, etc.)	.824		
	Rice growing (rice planting, rice cutting, etc.)			

Extraction method: Principal component analysis.

Rotation method: Varimax with kaiser normalization.

a. Rotation converged in 7 iterations.

Table 8. ANOVA for preferences of program on a cluster

	Cluster 1. Activity- oriented type		Cluster 2. Learning- oriented type		Cluster 3. Leisure- oriented type		Cluster 4. Purchase- oriented type		F	Sig.	Post Hoc Scheffe's
Fruit tree program											
Education learning program	3.14	.79	3.45	.76	2.91	.80	3.18	.73	12.345	.000	c<a=d<b
Harvest experience program	3.36	.77	3.553	.76	3.91	.57	4.00	.57	16.613	.000	a=b<c=d
Other program											
Education experience program	3.08	.86	3.05	.74	3.46	.62	3.49	.67	7.917	.000	a=b<c=d
Field herb farming program	3.13	.75	2.92	.89	3.00	.85	3.11	.89	.792	.499	a=b=c=d

a=activity oriented type, b=learning oriented type, c=leisure oriented type, d=purchase oriented type

meaningful. The factor of educational learning programs and the preference factor of post-harvest experience programs were extracted; their explanation powers were 42.917 and 28.909, respectively.

3.5. Preferred factor analysis of other experience and educational programs

We conducted preference research on other experience and educational programs. The factor analysis by Varimax was conducted to analyze the preferred factor. A factor with an eigenvalue over 1.0 was extracted. The entire explanation power was 62.3%. The suitability of the model was confirmed because KMO (Kaiser-Meyer-Olkin)=.821, and Chi-square of Bartlett's Test of Sphericity=979.685 (df=36) showed 1%, which is meaningful. The extracted factors were named the preferred factor of educational experience programs and the preferred factor of field herb farming programs (Table 7).

Preference differences by classified cluster were studied using ANOVA. This showed the differences

in the program related to educational learning (F=12.345, $p<0.05$), and the program related to harvest experience program (F=16.613, $p<0.05$). The learning-oriented type preferred the educational learning programs to the leisure-oriented type. The purchase-oriented and activity-oriented types showed the least preference for educational learning programs. The activity-oriented and learning-oriented types preferred the harvest experience program to the other clusters.

The educational experience and field herb-farming programs had a preference for the educational experience programs (F=7.917, $p<0.05$). Neither cluster had a difference in the preference of field herb farming program (F=0.792, $p>0.05$). Upon follow-up verification, the purchase-oriented and leisure-oriented types showed higher preferences for educational experience programs than the activity-oriented and learning-oriented types. This result is similar to the preferences in the harvest experience program.

4. Discussion and Conclusion

Results show that the market of fruit tree experience program can be divided into four segments based on customers' motivations: "activity-oriented," "learning-oriented," "leisure-oriented type," and "purchase-oriented type." This study also confirms the differences in program preferences by each cluster. We determined the general characteristics, use type, and specific characteristics of each cluster by potential customers. We found that each cluster is different in terms of gender, educational background, age, marital status, number of children, housing type, and whether or not they had gardening-related jobs. The clusters had other characteristics such as the desired fruit trees, related information-access paths, desired participation time, and the intention to carry costs. The majority of potential customers are learning-oriented types who comprise 35.5% of the respondents, and who are more likely to prefer educational learning programs such as fruit management, fruit picking, and bagging, more than other clusters. They tend to have one or two children and prefer to have more time to participate in experience programs. The activity-oriented type has the least preference for educational learning programs. However, the purchase-oriented and leisure-oriented types are more likely to prefer the harvest experience and the educational experience programs than the learning-oriented type. Therefore, in order to attract family type customers with children, a strategy to strengthen educational programs related to the curriculum of their children is recommended. Leisure-oriented and purchasing-oriented customers are more likely to prefer experience programs than educational programs, so it is necessary to present a variety of rural experience programs. These results have important implications for governments and rural tourism owners in that the characteristics of potential customers of the fruit tree

experience programs can be used to develop marketing strategies.

The results can also guide the development of fruit tree experience and educational programs according to the characteristics of potential customers, the goals of the program, and the characteristics of users. For example, a program that specifically focuses on families can be formed. This type of program can strengthen family ties. The program could also be developed by adding five-sense utilization and play factors. This would attract activity or learning-oriented types. Such custom programs will expand ecotourism and rural tourism. By customizing the program to the interests of people likely to attend, this value-added scheme has potential for growth. Results of this study can contribute towards sustainable rural development, and provide a supporting basis for the improvement of rural areas through the spread of ecotourism and rural tourism.

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