Elementary, Middle and High School Parents' Awareness of School Garden Education Service

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ABSTRACT

Background and objective: Education based on agricultural experience in school gardens is coming to the fore as a solution to reduce the negative effect of rapid urbanization and the development of information technology (IT) on students. Accordingly, this study aimed to investigate how parents of elementary, middle, and high school students in Korea perceive the value of education service using school gardens, as well as their willingness to participate in and pay for such service, and to utilize the results in a quantitative assessment of the socioeconomic value of the education service.

Methods: A contactless online survey on the perceived value of education service using school gardens was conducted on 1,010 parents of elementary, middle, and high school students in Korea's five major districts from October 22 to 26 (5 days) of 2020 by M, a Korean specialized survey agency. The data collected was analyzed using SPSS for Windows 25.0 and Excel to obtain the frequency and ratio of each measured item.

Results: The respondents had an average of 1.83, of which 52.8% were male. 55.3% of the respondents were aware of the education service using school gardens, and 27.9% experienced the service. When asked if they saw the educational service using school gardens as necessary, 79% answered in the affirmative. In terms of the difference in perception of the need for the service according to experience, 91.8% of the parents who experienced the service responded that it was necessary, indicating that it is important to provide opportunities to experience this service to expand the scope of service. 54.9% of all respondents responded they were willing to pay the costs required for school gardens. When income tax was used as a payment method, the average amount parents were willing to pay was 13,193 KRW, and the tax rate was 2.02%. Based on experience, those who experienced this service had a higher need and willingness to pay for the service than those who had not experience, but the actual amount or tax rate was low as they knew how it was operated.

Conclusion: As basic research on the assessment of the value of agricultural experience education using school gardens, this study determined how parents perceive this form of education service as well as their willingness to participate and pay for the service. These findings can be used to systemize the assessment indicators and promote the value of the education service using school gardens, allowing students to maintain a healthy and happy school life through agricultural experience.

Keywords: agricultural experience, intent to participation, urban agriculture, value evaluation, willingness to pay

Introduction

Rapid urbanization reduced the opportunities for stu-

dents living in the city to encounter nature, and increased contact with virtual reality rather than the natural environment due to IT development has a negative impact on prop-

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er character education, such as school violence (GGC, 2012). Thus, the need to provide opportunities to easily enjoy green experiences within school grounds has been raised to enlighten students with the preciousness of nature, environment, and energy while also cultivating a balanced character. As an alternative, agricultural experience-based education using 'school gardens' is receiving attention (Jang et al., 2017). Agricultural activities experienced within school grounds not only reduce stress of students and improve their health, concentration and social skills but also promote understanding about agriculture and rural areas (Kwack and Park, 2017).

School gardens have been valued as an educational tool since the 18th-century Europe until today, referring to the green space created within school grounds with many philosophers emphasizing the importance of sensory experiences (GGC, 2012). Article 8, paragraph (1)-5 of the Act on Development and Support of Urban Agriculture defines urban agriculture for school education as urban agriculture by utilizing the land or building of a school for students' learning and practice. Therefore, school garden education service is a service providing various education programs about nutrition, dietary life, and cultural events along with agricultural experience. According to the 'Survey on Actual Conditions of Urban Agriculture (operation status of school gardens)' conducted by the Seoul Metropolitan Office of Education in 2012, 66.8% of elementary schools in Seoul have school gardens (Kim, 2014), and nearly half the population of urban agricultural is participating in 'urban agriculture for school education' defined in the Act on Development and Support of Urban Agriculture (MAFRA, 2017). As such, various effects of activities using school gardens have been reported, and education programs based on various gardening activities improve students' responsibility, sense of accomplishment, confidence, stability, social skills, and peer relations, thereby having positive effects on character cultivation as well (Kim and Jeong, 2008; Jeong and Lee, 2013; Hong and Kim, 2017). Thus, continuous expansion of school garden education is needed, but there were issues such as difficulty in securing space, additional operating expenses, negative opinions among parents about gardening activities, and low educational use. Furthermore, there are almost no studies on the values of

school garden education service aside from Hong et al. (2020), and thus there is an urgent need to develop evaluation indicators for value expansion of agricultural experience to create a healthy and happy school life for students. Accordingly, as a basic study to derive evaluation indicators, we extracted samples with proportionate sampling in 5 major districts in Korea and conducted a survey on parents of elementary, middle, and high school students to determine their awareness of the value of school garden education service as well as their intent to participate and willingness to pay. The results of this study will be used in evaluation of quantitative socioeconomic values of school garden education service in the future.

Research Methods

Subjects and methods

To examine parents' awareness of school garden education service, we conducted a survey on 1,010 parents of elementary, middle, and high school students in the 5 major districts from October 22 to 26, 2020 (5 days). The questionnaire was distributed after determining whether there are children under age 18 attending elementary, middle, or high school. To avoid redundancy of survey respondents, the sample size of parents with multiple children was adjusted based on gender and grade of the first child. To secure sample representativeness, we selected the samples by proportionate sampling by region through a Korean specialized survey agency M located in Seoul, and conducted a contactless online survey considering the COVID-19 situation.

Contents

The survey items were comprised of total 7 items of demographic characteristics such as gender, age, residence, occupation, highest level of education, monthly income, number of children, child's gender, and child's grade. To smoothly conduct this study, the purpose and contents of the survey as well as the concept of education-based agricultural experience service using school gardens were suffi-

ciently described in the questionnaire, after which we organized the survey with 3 items such as awareness of the relevant contents, necessity, and participation experience, and 3 items such as willingness to pay for expenses in creating gardens, installing amenities, operating various education programs, and installing other facilities, the maximum amount they are willing to pay, and the willingness to additionally pay for the increased individual consumption tax used as a finance for educational taxes to cover the expenses. For maximum amount and individual consumption tax rate the respondents are willing to pay, the respondents were to provide responses in the form of a self-report test.

Data analysis

From 1,010 copies of the questionnaire collected, we obtained the frequency and weight of each measurement item using SPSS for Windows 25.0 and Excel 2016. A frequency analysis was conducted on demographic characteristics such as gender, age, residence, occupation, highest level of education, monthly income, number of children and their grade. The difference in the awareness of school garden education service was surveyed using a 5-point Likert scale. The respondents were to rate the items on a scale of 1 to 5, with higher scores indicating that they are better aware. A paired sample t-test was conducted to determine the necessity of the school garden education service based on experience. The means of pros and cons of education service, intent to participate, and willingness to pay were obtained, and one-way ANOVA was conducted to determine the willingness to pay based on experience.

Results and Discussion

Demographic characteristics of respondents

There were 494 male (48.9%) and 516 female (51.1%) respondents, with slightly more women than men. Most of the respondents were in their 40s (722, 71.5%), followed by 30s and below (168, 16.6%) and 50s (120, 11.9%). 359 respondents (35.5%) lived in Gyeonggi/Gangwon/Incheon,

followed by 158 in Seoul (15.6%), 156 in Busan/Ulsan/Gyeongnam (15.4%), 122 in Gwangju/Jeonbuk/Jeonnam/Jeju (12.1%), 115 in Daejeon/Sejong/Chungbuk/Chungnam (11.4%), and 100 in Daegu/Gyeongbuk (9.9%). Most were salaried employees (577, 57.1%), followed by homemakers (214, 21.2%), self-employed (82, 8.1%), specialized professions (66, 6.5%), government officials (41, 4.1%), others (29, 2.9%), and student (1, 0.1%). Others included various responses such as daycare teachers, social workers, salesclerks, special workers, freelancers, religious professions, and unemployed. For highest level of education, most were university students/graduates (755, 74.8%), followed by high school graduates (140, 13.9%), graduate school or higher (114, 11.3%), and middle school graduate or lower (1, 0.1%). For average monthly income, most respondents earned 4-4.99 million KRW (230, 22.8%), followed by 5-5.99 million KRW (189, 18.7%), 3-3.99 million KRW (164, 16.2%), 6-6.99 million KRW (115, 11.4%), 7-7.99 million KRW (94, 9.3%), 2-2.99 million KRW & 8-8.99 million KRW (62, 6.1%), 10 million KRW and higher (49, 4.9%), 9-9.99 million KRW (28, 2.8%), 1-1.99 million KRW (13, 1.3%), and lower than 1 million KRW (4, 0.4%). For the child's gender, there were more male children (533, 52.8%) than female (477, 47.2%), and the average number of children was 1.83 (1.75 in elementary school, 1.86 in middle school, 1.88 in high school) (Table 1).

A survey on parents' awareness of school garden education service

As a result of asking the respondents about whether they are aware of school garden education service, 55.3% (558) responded that they have heard of it and are well aware, whereas 44.7% (452) barely knew about it. This is quite different from the study by RDA (2014) showing that more than 90% of respondents were aware of school gardens. This may be due to the different opinions from understanding education service separately from garden space. Thus, it is necessary to seek qualitative improvement of space for education service by aligning this service with programs that can increase satisfaction and interest. The mean of the awareness of education-based agricultural experience service using school gardens was 2.66 (2.65 in

Table 1. Demographic characteristics of the research subject.

[unit: number(%)]

	Item	Elementary	Middle	High	Total
Gender	Male	164(46.5)	160(48.9)	170(51.5)	494(48.9)
	Female	189(53.5)	167(51.1)	160(48.5)	516(51.1)
Age	Under 30	135(38.2)	23(7.0)	10(3.0)	168(16.6)
	40s	208(58.9)	277(84.7)	237(71.8)	722(71.5)
	50s	10(2.8)	27(8.3)	83(25.2)	120(11.9)
Residence	Seoul	54(15.3)	51(15.6)	53(16.1)	158(15.6)
	Kyeonggi/Gangwon/Incheon	128(36.3)	117(35.8)	114(34.5)	359(35.5)
	Daejeon/Sejong/Chungbuk/Chungnam	40(11.3)	37(11.3)	38(11.5)	115(11.4)
	Gwangju/Jeonbuk/Jeonnam/Jeju	42(11.9)	41(12.5)	39(11.8)	122(12.1)
	Dae-gu/Gyeongbuk	33(9.3)	32(9.8)	35(10.6)	100(9.9)
	Busan/Ulsan/Gyeongnam	56(15.9)	49(15.0)	51(15.5)	156(15.4)
Occupation	Salaried employees	213(60.3)	189(57.8)	175(53.0)	577(57.1)
	Self-employed	24(6.8)	23(7.0)	35(10.6)	82(8.1)
	Specialized professions	24(6.8)	15(4.6)	27(8.2)	66(6.5)
	Government official	14(4.0)	11(3.4)	16(4.8)	41(4.1)
	Homemakers	71(20.1)	76(23.2)	67(20.3)	214(21.2)
	Students	0(0.0)	1(0.3)	0(0.0)	1(0.1)
	Other	7(2.0)	12(3.7)	10(3.0)	29(2.9)
Highest level of education	Middle school graduate	0(0.0)	1(0.3)	0(0.0)	1(0.1)
	High school graduate	37(10.5)	45(13.8)	58(17.6)	140(13.9)
	University graduate	274(77.6)	247(75.5)	234(70.9)	755(74.8)
	Graduate school or higher	42(11.9)	34(10.4)	38(11.5)	114(11.3)
Monthly income	Less than 1 million won	2(0.6)	1(0.3)	1(0.3)	4(0.4)
	1,000,000-1,990,000 won	6(1.7)	3(0.9)	4(1.2)	13(1.3)
	2,000,000-2,990,000 won	22(6.2)	22(6.7)	18(5.5)	62(6.1)
	3,000,000-3,990,000 won	69(19.5)	51(15.6)	44(13.3)	164(16.2)
	4,000,000-4,990,000 won	78(22.1)	76(23.2)	76(23.0)	230(22.8)
	5,000,000-5,990,000 won	68(19.3)	44(13.5)	77(23.3)	189(18.7)
	6,000,000-6,990,000 won	34(9.6)	46(14.1)	35(10.6)	115(11.4)
	7,000,000-7,990,000 won	37(10.5)	29(8.9)	28(8.5)	94(9.3)
	8,000,000-8,990,000 won	20(5.7)	22(6.7)	20(6.1)	62(6.1)
	9,000,000-9,990,000 won	6(1.7)	14(4.3)	8(2.4)	28(2.8)
	10 million won or more	11(3.1)	19(5.8)	19(5.8)	49(4.9)
Child gender	Male	180(51.0)	170(52.0)	183(55.5)	533(52.8)
	Female	173(49.0)	157(48.0)	147(44.5)	477(47.2)

elementary school, 2.69 in middle school, 2.65 in high school) out of 5, which was low at below average and showing no statistically significant difference ($p=.889$, Table 2).

282 respondents (27.9%) said they have experienced school garden education service. This is different from the

study by Kim (2014) showing that only 62% of the parents who experienced gardening activities also have experience participating in school gardens. This indicates that there is an urgent need for development of new programs aligning school education with gardening activities in addition to plant cultivation as well as publicity to expand the scope

Table 2. Awareness level of school garden education service.

(unit: number(%))

Item ^z	Awareness level ^y					Mean±SD	F	Significant
	y1	y2	y3	y4	y5			
x1	60(17.0)	97(27.5)	115(32.6)	69(19.5)	12(3.4)	2.65 ± 1.08	0.118	.889 ^{NS}
x2	61(18.7)	91(27.8)	86(26.3)	67(20.5)	22(6.7)	2.69 ± 1.19		
x3	65(19.7)	78(23.6)	106(32.1)	68(20.6)	13(3.9)	2.65 ± 1.13		
Total	186(18.4)	266(26.3)	307(30.4)	204(20.2)	47(4.7)	2.66 ± 1.13		

Note. Values are mean (standard deviation).

^zx1 = Elementary school; x2 = Middle school; x3 = High school.

^yy1 = No idea; y2 = Hardly know; y3 = Heard; y4 = Know a little; y5 = Know well.

^{NS}Non-significant by ANOVA test.

Table 3. Recognition of experience and necessity of school garden education service.

(unit: number(%))

Division	Item ^z	Recognition ^y			Mean±SD	F	Significant
		y1	y2				
Experience	x1	98(27.8)	255(72.2)		1.72 ± 0.45	1.075	.342 ^{NS}
	x2	100(30.6)	227(69.4)		1.69 ± 0.46		
	x3	84(25.5)	246(74.5)		1.75 ± 0.44		
	Total	282(27.9)	728(72.1)		1.72 ± 0.45		
Division	Item ^z	y3	y4	y5	Mean±SD	F	Significant
Necessity	x1	300(85.0)	20(5.7)	33(9.3)	1.24 ± 0.61	8.652	.001 ^{***}
	x2	259(79.2)	22(6.7)	46(14.1)	1.35 ± 0.71		
	x3	239(72.4)	27(8.2)	64(19.4)	1.47 ± 0.80		
	Total	798(79.0)	69(6.8)	143(14.2)	1.35 ± 0.72		

Note. Values are mean (standard deviation).

^zx1 = Elementary school; x2 = Middle school; x3 = High school.

^yy1 = Yes; y2 = No; y3 = Need; y4 = No need; y5 = Don't know.

^{NS}Non-significant, ^{***} at $p < .001$ by ANOVA test.

of school garden education service. Regarding the necessity of school garden education service, 798 (79%) out of 1,010 respondents said it was necessary. This is similar to the results of Kim (2014) in which 81% of the respondents said it was necessary, indicating that people perceived a high level of necessity of school gardens, similarly to the definition that school gardens can be a teaching strategy (Kim, 2014). On the other hand, 6.8% (69) responded it was not necessary, suggesting the need to continuously determine and monitor the current state by developing and supplying best practices so that people can find interest (Table 3).

In the different awareness of the necessity of school garden education service, the experience of the respondents who said it was 'necessary' was 1.24%, which was 0.29%

higher than 'not necessary', thereby showing a difference in awareness of necessity depending on experience. As a result of examining the correlation with necessity based on experience, 91.8% of parents with experience responded that school garden education service was necessary, and 74.0% of those without experience responded it was necessary. This shows that parents with experience had higher awareness of the necessity of school garden education service, and thus providing experience opportunities in terms of expanding school garden education service is an important factor. The t-test results showed that there was a statistically significant difference at the 95% confidence level between school garden education service necessity and participation experience in gardening activities (Table 4).

As a result of conducting the χ^2 test to compare the differ-

ence in awareness and necessity of school garden education service depending on experience, there was a statistically significant result at the 95% significance level, showing a difference in awareness and necessity depending on participation experience (Table 5). This is similar to the report of the RDA (2014) showing that participating in school gardens have positive effects on health, social, emotional, and environmental factors, thereby increasing the interest among participants so that they are willing to participate whenever they get the chance.

Willingness to pay for the operating expenses of school garden education service

We provided an explanation there are expenses for school garden education service, such as creating gardens, installing amenities, operating various education programs, and installing other facilities, after which we surveyed the willingness to pay for the operating expenses. The results showed that 54.9% (554) were willing to pay, but there

was no statistically significant difference as a result of one-way ANOVA (Table 6). This is different from the RDA (2014) reporting that 62% of respondents were willing to pay for the operating expenses of school gardens, but this can be interpreted as parents who enthusiastically want the school garden education service to be provided after paying for the expenses. On the other hand, most respondents not willing to pay thought that this service 'must be created and operated by the finances of the school, local government, and government'. This suggests that, to promote use of school gardens, the government and local governments must provide continuous support and maintenance such as providing financial and material support, and nurturing instructors with expertise and specialized knowledge in operating school gardens.

For willingness to pay depending on experience, 65.2% of those with experience and 50.8% of those without experience had willingness to pay, indicating that those who have experience were more willing to pay. The difference depending on the experience of respondents who have will-

Table 4. Differences in perception of the necessity of school garden education services according to the experience. (unit: number(%))

Item ^z	x1			x2			x3			Total			p
Division ^y	Experience existence and nonexistence ^x												
	A	B	A/B	A	B	A/B	A	B	A/B	A	B	A/B	
y1	95(96.9)	205(80.4)	1.21	90(90.0)	169(74.4)	1.21	74(88.1)	165(67.1)	1.31	259(91.8)	539(74.0)	1.24	.001***
y2	2(2.0)	18(7.1)	0.28	3(3.0)	19(8.4)	0.36	2(2.4)	25(10.2)	0.23	7(2.5)	62(8.5)	0.29	
y3	1(1.0)	32(12.5)	0.08	7(7.0)	39(17.2)	0.41	8(9.5)	56(22.8)	0.42	16(5.7)	127(17.4)	0.33	
Total	98(100.0)	255(100.0)	1.00	100(100.0)	227(100.0)	1.00	84(100.0)	246(100.0)	1.00	282(100.0)	728(100.0)	1.00	

Note. Values are mean(standard deviation).

^zx1 = Elementary school; x2 = Middle school; x3 = High school.

^yy1 = Need; y2 = No need; y3 = Don't know.

^xA = Experience existence; B = Experience nonexistence.

*** significant at $p < .001$ by t test.

Table 5. Differences in awareness level and necessity of school garden education services according to the experience. (unit: number(%))

Item ^y		Awareness level					x ²	p	Necessity			x ²	p
		y1	y2	y3	y4	y5			y6	y7	y8		
Experience	Yes	10(1.0)	16(1.6)	97(9.6)	122(12.1)	37(3.7)			259(25.6)	7(0.7)	16(1.6)		
	No	176(17.4)	250(24.8)	210(20.8)	82(8.1)	10(1.0)	275.776	.000***	539(53.4)	62(6.1)	127(12.6)	38.882	.001***
	Total	186(18.4)	266(26.3)	307(30.4)	204(20.2)	47(4.7)			798(79.0)	69(6.8)	143(14.2)		

Note. Values are mean (standard deviation).

^yy1 = No idea; y2=Hardly know; y3 = Heard; y4 = Know a little; y5 = Know well; y6 = Yes; y7 = No.

*** significant at $p < 0.001$ leveled by chi-square test.

ingness to pay was 1.28, which is quite higher than 0.71 of respondents who do not (Table 7). This shows that respondents with actual experience showed more active intent to participate than those without experience in terms of necessity of school garden education service.

As a result of conducting a paired sample t-test to verify the relationship between school garden education service experience and willingness to pay, there was a statistically significant difference at the 95% confidence level (Table 8). This supported the hypothesis that 'willingness to pay for school garden education service may vary depending on experience.'

We examined the willingness to pay among parents willing to pay for operating expenses with income tax (direct

tax) or individual consumption tax (indirect tax) and found out that the amount among those with experience was maximum 100,000 KRW and minimum 500 KRW, and the amount among those without experience was maximum 120,000 KRW and minimum 10 KRW. The average amount willing to pay in income tax was 13,193 KRW, and those without experience (13,399 KRW) showed a slightly bigger amount than those with experience (12,780 KRW). This was higher than the results of the RDA (2014) that reported 5,000-10,000 KRW and Kim (2014) that reported 3,000-10,000 KRW, and was statistically significant as a result of one-way ANOVA (Table 9).

When the means of payment was individual consumption tax (indirect tax), the average tax rate willing to pay was

Table 6. Willingness to pay the operating cost of school garden education service. (unit: number(%))

Item ^z	Yes	No	Mean±SD	F	Significant
x1	207(58.6)	146(41.4)	1.41 ± 0.49	2.640	.072 ^{NS}
x2	182(55.7)	145(44.3)	1.44 ± 0.50		
x3	165(50.0)	165(50.0)	1.50 ± 0.50		
Total	554(54.9)	456(45.1)	1.45 ± 0.50		

Note. Values are mean(standard deviation).

^zx1 = Elementary school; x2 = Middle school; x3 = High school.

^{NS}Non-significant by ANOVA test.

Table 7. Operating experiences of school garden education services according to the experience and willingness to pay. (unit: number(%))

Item ^z	x1			x2			x3			Total		
Division ^y	Experience existence and nonexistence ^x											
	A	B	A/B	A	B	A/B	A	B	A/B	A	B	A/B
y1	68(69.4)	139(54.5)	1.27	63(63.0)	119(52.4)	1.20	53(63.1)	112(45.5)	1.39	184(65.2)	370(50.8)	1.28
y2	30(30.6)	116(45.5)	0.67	37(37.0)	108(47.6)	0.78	31(36.9)	134(54.5)	0.68	98(34.8)	358(49.2)	0.71
Total	98(100.0)	255(100.0)	1.00	100(100.0)	227(100.0)	1.00	84(100.0)	246(100.0)	1.00	282(100.0)	728(100.0)	1.00

Note. Values are mean(standard deviation).

^zx1 = Elementary school; x2 = Middle school; x3 = High school.

^yy1 = Yes; y2 = No.

^xA = Experience existence; B = Experience nonexistence.

***significant at $p < .001$ by t test.

Table 8. Relationship between the experience and willingness to pay of school garden education services.

Item	n	Mean±SD	t	df	p
Experience	1010	1.72±0.45	13.683	1009	.000***
Willingness to pay	1010	1.45±0.50			

***significant at $p < 0.001$ by t test.

Table 9. Amount of intention to pay school garden education services using income tax as a payment method. (unit : won)

Item ^z	x1			x2			x3			Total			F	p
Division	Experience existence and nonexistence ^x													
	A	B	T	A	B	T	A	B	T	A	B	T		
Mean	13,301	15,003	14,444	12,579	14,315	13,714	12,349	10,434	11,049	12,780	13,399	13,193	3.870	.021 [*]
Max	100,00	120,00	120,00	100,00	100,00	100,00	100,00	120,00	120,00	100,00	120,00	120,00		
	0	0	0	0	0	0	0	0	0	0	0	0		
Min	500	500	500	500	10	10	500	100	100	500	10	10		
SD	14,933	19,169	17,870	14,375	19,746	18,046	14,284	14,635	14,507	14,484	18,178	17,030		

Note. Values are mean(standard deviation).

^zx1=Elementary school; x2=Middle school; x3= High school.

^xA=Experience existence; B=Experience nonexistence; T=Total.

*significant at $p < 0.05$ by ANOVA test.

Table 10. Tax rate of intention to pay school garden education services using individual consumption tax as a payment method (unit : %)

Item ^z	x1			x2			x3			Total			F	p
Division	Experience existence and nonexistence ^x													
	A	B	T	A	B	T	A	B	T	A	B	T		
Mean	1.64	1.72	1.69	1.89	1.95	1.93	1.70	2.92	2.52	1.74	2.16	2.02	1.075	.342 ^{NS}
Max	9.0	9.0	9.0	9.0	9.0	9.0	9.0	10.0	10.0	9.0	10.0	10.0		
Min	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0		
SD	2.52	2.76	2.68	3.03	2.96	2.97	2.63	3.70	3.43	2.72	3.16	3.03		

Note. Values are mean(standard deviation).

^zx1 = Elementary school; x2 = Middle school; x3 = High school.

^xA = Experience existence; B = Experience nonexistence; T = Total.

^{NS}Non-significant by ANOVA test.

2.02%. Like income tax, the tax rate among those without experience (2.16%) was higher than those without experience (1.74%), and the result was not statistically significant as a result of one-way ANOVA (Table 10). This tax rate difference between those with experience at 0.1-9.0% and those without experience at 0-10% may be due to the fact that those who experienced school garden education service perceived higher necessity of the service and showed higher willingness to pay, but set the amount or tax rate lower because they are aware of the operation status through actual experience.

Conclusion

To determine the awareness of school garden education

service as well as intent to participate and willingness to pay for the service among 1,010 parents of elementary, middle, and high school students in 5 major districts, this study conducted an online survey through a specialized research institute from October 22 to 26, 2020. The results of obtaining the frequency and weight of each measurement item and determining the pros and cons about education service, intent to participate, and willingness to pay depending on school garden experience are as follows.

First, there were 494 male (48.9%) and 516 female (51.1%) respondents, with slightly more women than men. Most of the respondents were in their 40s (722, 71.5%), and 359 respondents (35.5%) lived in Gyeonggi/Gangwon/Incheon. Most were salaried employees (577, 57.1%), and their highest level of education was mostly university students/graduates (755, 74.8%). For average monthly income, most re-

spondents earned 4-4.99 million KRW (230, 22.8%), and the average number of children was 1.83, with slightly more male children (52.8%) than female.

Second, 55.3% of the respondents were aware of school garden education service, but the mean was low at 2.66. Only 27.9% of the respondents have experience participating in relevant service, and 79% of all respondents said school garden education service was necessary. Depending on experience, 91.8% of parents with experience said the service was necessary, whereas 74.0% of those without experience said it was necessary, indicating how important it is to provide opportunities to experience this service in terms of expanding school garden education service. The necessity of school garden education service necessity and participation experience in gardening activities showed a statistically significant difference at the 95% confidence level.

Third, 54.9% of all respondents said they were willing to pay for the expenses of school garden education service such as creating gardens, installing amenities, operating various education programs, and installing other facilities. 65.2% of those with experience and 50.8% of those without experience were willing to pay, indicating that the former were more willing to pay for school garden education service. As a result of conducting a paired sample t-test to determine the relationship between school garden education service experience and willingness to pay, there was a statistically significant difference at the 95% confidence level. Moreover, the average amount that the respondents were willing to pay when the means of payment was income tax was 13, 193 KRW, and the tax rate was 2.02%. Those with experience perceived higher necessity of school garden education service than those without experience and also showed higher willingness to pay, but they actually set lower amount or tax rate since they are aware of the actual operation status.

This study has limitations in that the survey was conducted online in a contactless form due to COVID-19 and thus the items of the questionnaire were limited. Nonetheless, to promote use of school gardens, the government and local governments must provide continuous support and maintenance such as providing financial and material support, and nurturing instructors with expertise and specialized

knowledge in operating school gardens. The creation and utilization of school gardens are expected to increase continuously due to the diverse effects of school gardens as well as the social atmosphere, raising an urgent need to establish valuation indicators for school garden education service to continuously operate and maximize the effects of school gardens. The results of this study can be used to develop evaluation indicators for school garden service and even evaluate socioeconomic values in further research.

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