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CONTENTS

Comparative analysis of schools on student's attitude, knowledge level and perceived effectiveness on school vegetable garden

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ABSTRACT: A school vegetable garden is an educational strategy to attract students towards gardening activities. The garden engages students by providing a dynamic environment where they can observe, discover, experiment, nurture, and learn. It provides opportunities for young minds to understand the basic lessons of agriculture and develop an affinity towards it. The present research was undertaken to explore the effectiveness of school vegetable garden as perceived by students, the knowledge level and attitude of students. The development of life skills was perceived as most significant by the students. The knowledge and attitude towards school vegetable garden were at medium level for majority of the students. Kruskal Wallis H test was used to analyse the group variability among schools for knowledge level, attitude and perceived effectiveness. The results indicated significant variation among schools with respect to knowledge and attitude while no remarkable difference was observed for perceived effectiveness.

Key words: Attitude, effectiveness, knowledge, school vegetable garden, vegetable garden

A school garden is an educational strategy to influence students into the natural environment through gardening activities. The gardening activities give the students a positive attitude towards the environment, responsible self-learning procedure, knowledge about the hardship of raising crops on a small scale, awareness about the production of healthy food for consumption and helps to identify the limitations for doing gardening practices. Vegetable gardening can encourage student interaction with teachers, parents, and volunteers, primarily by means of growing plants and discovering the relationships between people, plants and environment (Alexander *et al.,* 1995). Whether in large cities or country settings, school gardens were expressions of modern and progressive education of the sort encouraged by Dewey. Gardens were encouraged in theory and in practice not only at the laboratory school affiliated with the University of Chicago but also in normal schools across the country (Kohlstedt, 2008).

School garden is a wonderful way to use the schoolyard as a classroom, reconnect students with the natural world and the true source of their food, and teach them valuable gardening and agriculture concepts and skills that integrate with several subjects, such as math, science, art, health and physical education**.** The school gardens have multitude of uses and aims, mainly in the areas of gardening, nutrition, marketing, environment, subjects, life skills and benefits to school and community. The study involves the comparative analysis among schools with the students' attitude, knowledge level and perceived effectiveness of school vegetable garden.

Knowledge level of students on vegetable cultivation

The study by Klemmer *et al.* (2005) on 'Effect of school gardening program' indicated that students who participated in a hands-on gardening programme had higher science achievement score than who did not. Hence, it could be inferred that student's knowledge level increases through hands-on experimental activities. Parmer *et al.* (2009) conducted the study on 'School gardens' and concluded that school gardens as a component of nutrition education could increase fruit and vegetable knowledge and cause behavioural change among children. They suggested that school administrators, classroom teachers, and nutrition educators should implement school gardens as a way to positively influence dietary habits at an early age. Dilip (2017) reported that 71.00 per cent of the students had a medium level of knowledge whereas 26.00 per cent and 3.00 per cent of students reported low and high level of knowledge on vegetable cultivation respectively.

Attitude of students on vegetable cultivation

Attitude is a mental and impartial condition of status sorted

out through involvement (Allport, 1935). Positive attitude towards agriculture technology helps in its adoption as well as motivate farmers in seeking more knowledge (Verma, 2016). Riedmiller (1995) stated that the quality of a school garden or agricultural learning material is the single most vital factor influencing the knowledge, skills, and attitudes of youth learning about agriculture. Lineberger and Zajicek (2000) conducted the study on 'School Gardens' revealed that after gardening, students' attitudes towards vegetables became significantly more positive. The study on 'Impact of school gardens on student attitudes and beliefs' by Childs (2011) revealed that the school gardens implied positive changes in student attitudes. Dilip (2017) in a study on ' Influence of school vegetable gardens on students and teachers' reported that as a result of students engaging in vegetable garden activities possessed attitude with high scores (60%).

Effectiveness of school vegetable gardens

The incorporation of a garden program within the school curriculum supports a student-centred experiential learning environment (Skelly and Bradley, 2000; Klemmer *et al.*, 2005; Block *et al.*, 2012). School personnel can use this gardening environment to promote academic learning (Klemmer *et al.*, 2005; Ozer, 2006; Skelly and Bradley, 2000); health (Newell *et al.*, 2004; Ozer, 2006; McCurdy *et al.*, 2010) and social and emotional learning and life skill development of students (Block *et al.*, 2012). Integrating garden activities within the school curriculum fosters the growth and development of children and promotes awareness of the natural environment. Childs (2011) reported that, based on gardening attitude responses, I can be seen that all students were having high garden maintenance knowledge. Skinner *et al.* (2011) showed that engagement in the garden was significantly and positively correlated with students' academic engagement and perceptions of their sense of relatedness, competence, intrinsic motivation, and autonomy in school. The gardening concept at schools had positively influenced the mode of teaching and the skills of students. It also improved household food production and nutritional security of student learners (Laurie *et al.*, 2013).

MATERIALS AND METHODS

Ex-post facto research design was used for the study. The study was conducted in Nenmara and Kollengode blocks of Palakkad district, Kerala, India. Three panchayat each from Nenmara and Kollengode blocks were randomly selected. From these six panchayats, one school each was selected randomly. Two stage random sampling procedure was adopted. The six panchayats were Nenmara, Pallasana, and Elavanchery from Nenmara block and Koduvayur, Muthalamada, and Vadavannur from Kollengode. Six schools which had school vegetable garden were selected. From each selected six schools, 30 students were selected as respondents, thus contributing 180 respondents for the study. The age group of students ranges from 11 to 16 years old.

A standardized knowledge test was developed to measure the knowledge of respondents. To assess the knowledge of the students on vegetable cultivation, 25 questions including open-ended questions, yes/no questions and multiple-choice questions were included in the questionnaire. These questions were framed with a view to assess the awareness of respondents on various aspects of agriculture including basic awareness on crops, crop production, crop protection, harvesting and processing. The procedures adopted by Jaganathan *et al.* (2012) was used with suitable modification. The formulae for calculating knowledge index is mentioned below;

$$\text{Knowledge Index} = \frac{\text{Respondents total score}}{\text{Total possible score}} \times 100$$

The attitude of school students was the main dependent variable of the study. It was measured using the procedure developed in the EARTH [Education and Resiliency Through Horticulture] program (1999). Perceived effectiveness of school vegetable garden by the students were analysed using the statements employed by Fathima (2015) with suitable modifications.

Kruskal Wallis one-way analysis of variance by ranks tests the null hypothesis whether k samples come from same population or from identical populations with same median. The test was used to analyse the difference between the students of six schools with respect to their knowledge, attitude and perception of effectiveness of school vegetable garden programme.

$$\text{KW (Kruskal wallis statistic)} = \frac{12}{N(N+1)} \sum_{j=1}^{k} n_j (mR_j - mR)^2$$

k =number of samples or groups
n_j = number of cases in the j^{th} sample
N=number of cases in the combined sample (the ample of the n_js)
R_j = sum of the ranks in the j^{th} sample or group
$m R_j$ = average of the ranks in the j^{th} sample or group
$m R = (N+1)/2$ = the average of the ranks in the combined sample (the grand)

RESULTS AND DISCUSSION

Knowledge in this study was operationalized as the extent

Table 1 : Distribution of students according to their knowledge on vegetable cultivation

Knowledge level of students			
Students (N=180)			
Category	**Class limits**	**Frequency**	**Percentage**
Very low	<79.41	37	20.55
Low	79.41-82.19	13	7.22
Medium	82.19-87.75	71	39.44
High	87.75-90.52	27	15.00
Very high	> 90.52	32	17.77
Total		180	100.00
Mean	84.97		
SD	2.77		
SE	0.207		

Table 2: Distribution of students based on their attitude towards managing and maintaining school vegetable garden

Category	Students(N=180)		
	Attitude Score	Frequency	Percentage
High	>47	25	13.88
Medium	35-47	114	63.33
Low	<35	41	22.77
Mean	41.63		
SD	5.85		
SE	0.43		

Table 3: Perception on the effectiveness of school vegetable garden as perceived by student respondents

Sl. No.	Parameter	Perception score	Rank
1	Development of life skills	1135.38	1
2	Performance of intercultural operations	1071.37	2
3	Knowledge aspects	1070.62	3
4	Participation and involvement of students	1048.95	4
5	Improvement in environment stewardship	1035.97	5
6	Selection of crop and season	901.40	6
7	Supply of agricultural inputs	691.99	7

Table 4: Group variability among students (Kruskal - Wallis test)

Variables	VIMHSS PALLASHANA	GUPS CHATHAMANGALAM	GHSS MUTHALAMADA	DMUPS ELEVANCHERY	DMUPS ELEVANCHERY	AMMUPS VADAVANNUR	H Value
Knowledge	53.60(5)	87.52(4)	117.03(3)	31.60(6)	131.77(1)	121.48(2)	92.32
Attitude	53.88(6)	88.68(4)	112.67(2)	92.03(3)	116.05(1)	79.68(5)	29.16
Perceived effectiveness	84.72(5)	100.1(1)	94.07(2)	90.4(4)	93.98(3)	79.73(6)	3.01

of information possessed by the students on vegetable cultivation. The distribution of the students according to their knowledge on vegetable cultivation is presented in Table 1 and Fig.1. From the Table 1, it is evident that 17.77 per cent students possessed very high level of knowledge followed by 15.00 per cent with high level and 39.44 per cent with medium level. It was observed that only 7.2 per cent had low and 20.5 percent had very low level of knowledge. Meanwhile, it was observed that the majority of the students had a medium level of knowledge on vegetable production, crop protection, manuring, irrigation intercultural operations, harvesting, processing, and nutritional aspects. Based on the findings, it is clear that the students who are actively involved in managing and maintaining school vegetable garden will have a greater level of knowledge on vegetables. The result also supports the findings of work done by Dilip (2017).

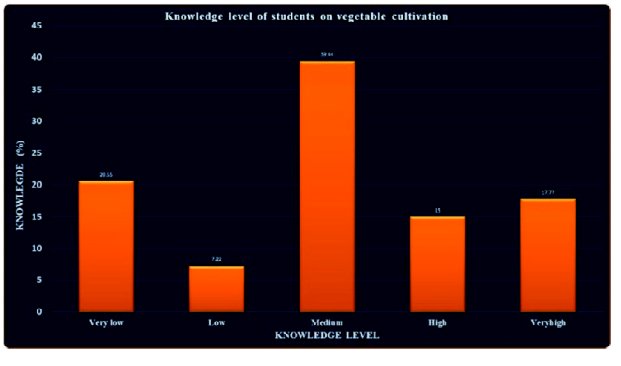

Fig. 1: Distribution of students based on their knowledge level

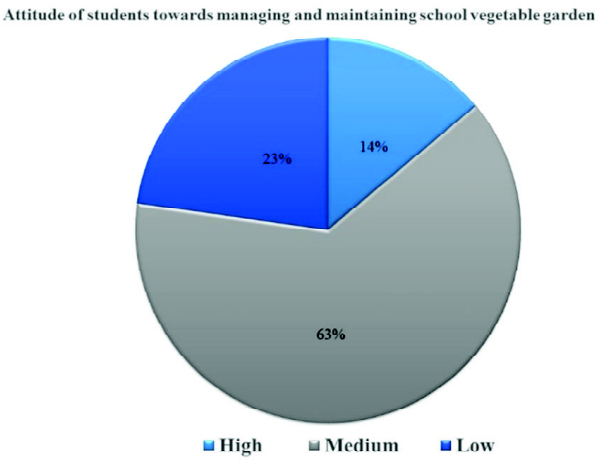

Fig. 2: Distribution of students based on their attitude

The attitude of school students was one of the dependent variables of the study. The students were categorized based on different mean value of total attitude score as the check and the results are given in Table 2 and Fig. 2. It is evident from Table. 2 that 13.88 per cent of students possessed high attitude towards gardening and majority (63.33 %) of the students belonged to medium category. This might be due to the active involvement of students in school vegetable garden activities. Only 22.77 per cent of students fell in the low category. The result was in conformity with the findings of Lineberger and Zajicek (2000) and Childs's (2011).

The student's perception on the effectiveness of school vegetable garden as perceived by the student respondents was studied and presented in table.3. From Table 3, it can be seen that development of life skills perceived higher score in the among the students. The supply of agricultural inputs was the least perceived parameter by the students. A garden is an environment in miniature, and to be successful one must work in sympathy with nature. The garden programme will influence students to ask questions, share thoughts, and work cooperatively towards a common goal. The present study results are in line with the findings of Skelly and Bradley (2000), Robinson and Zaijicek (2005) and Rodriguez *et al*. (2015). From table-4, the results indicate that there was a significant difference in their knowledge and attitude at 1 per cent level with H values 92.32 and 29.16 respectively. While there was no significant difference with regard to their perception on effectiveness of school vegetable garden programme. It may be due to the fact that the scheme was implemented based on the given guidelines and procedure.

CONCLUSION

The knowledge and attitude towards school vegetable garden were at medium level for majority of the students. There is a significant variation among schools with respect to knowledge and attitude while no remarkable difference was observed for perceived effectiveness. It can be concluded that the knowledge level and attitude of students will gradually increases although the perceived effectiveness implies it will help in development of life skills of the students.

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