Educational Facility Users: A Study on Improving Environmental Curricula and General Pedagogy from Students and Instructors in Anyang

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Abstract

The purpose of this study was to investigate ways to improve environmental curricula and local pedagogy by analyzing the satisfaction factors of student and instructors of various educational facilities in Anyang, South Korea. A survey questionnaire was conducted for 30 days from August 27, 2018 to September 26, 2018, for a sample group consisting of 1,000 participants in Anyang. The survey questionnaire investigated various curricula and the educational, recreational, social, and environmental effects of pedagogy while studying the spatial, service, environmental, and policy factors of its corresponding facilities for both students and instructors.

The cognitions of 'Awareness to curriculum and pedagogy' were analyzed. The cognitions of the purpose of taking classes were dispersed somewhat steadily among possible selections with '...for personal growth in developing skills.' set at the highest frequency, and '...to be able to give and follow orders.' set at the lowest frequency. In addition, class satisfaction was moderately set at above average frequency, while the above average frequency of student-teacher relationships was set moderately lower than class satisfaction's above average frequency. In regards to curriculum and pedagogy satisfaction, the frequencies of both were set somewhat steadily. 'Athletics and wellness' was the most liked, while 'Mathematics' was the least liked. In addition, 'Visual spatial' and 'Auditory-musical' was the most liked, while

'Solitary' study was the least liked. Then, in 'Checking academic progress', 'Tests/exams' was set at the highest frequency, while 'Frequent homework' was set at the lowest frequency. In regards to fondness of nature and pets, 'Outdoor activities' was set at a significantly high frequency of approval, while 'Have or want pets' was set at a significantly low frequency of approval. Thus, the potential capability of environmental curricula improvements and general pedagogical improvements is very strong. In cognition towards the awareness on effects of environmental pedagogy, 'Participate in camping and outdoor sporting (fishing, hiking, etc.)' and 'Participate in special interest meetings (hobbies and camps)' were shown to be in high points of agreement. Furthermore, in preference of the types and activities of the 7 styles of pedagogy, 'Use images, pictures, color and other visual media', 'Use sound, rhyme, and music', 'Role-playing is a technique that works well with others', and 'Highlighting your thoughts and feelings when you visualize' were shown to be highly preferred types. Within the awareness on effects of environmental pedagogy, the three (3) factors were categorized as; 'Environmental improving effects', 'Cultivation of gardens', and 'Participation in experiencing/education programs' respectfully. In addition, three (3) factors were prevalent in types and activities of the 7 styles of pedagogy, thus categorized as 'Analytical Learner', 'Emotional Learner', and 'Investigative Learner'.

In addition to conducting a correlation analysis to determine the correlation between the preference of class satisfaction and satisfaction with nature responses for possible continuity, further research analytics rearranged the acquired data into two (2) additional forms of data output consisting of clusters and parallel plot groups. There were four (4) distinct clusters created from a dendrogram that grouped each participant's profile according to fifty-six (56) of their cumulative survey questionnaire responses. Within the dendrogram of participant profiles, the four clusters were categorized as; 'Low environmental engagement', 'Moderate environmental engagement', 'High environmental engagement', and 'Arbitrary environmental engagement' with respect to environmental curriculum and pedagogy. Furthermore, the dendrogram data was converted to a series parallel plot points groups. Moreover, five (5) additional parallel plot groups were created and categorized by academic level, occupation, residence, age, and gender respectively.

Conclusively, although the current situation of the city of Anyang is in the stages of major urban redevelopment, the potential overall effects of environmental education in Anyang are great. In the future, a diverse plethora of programs, such as diverse education/experiencing programs and information supporting programs can be applied to future curriculum and pedagogical development. In addition, the results of this study can be used as basic material for studying environmental awareness and directions of improvement for environmental education and pedagogy in the future.

Keywords: Curriculum-based, Pedagogy, Learning Styles, Education Programs, Environmental Awareness

l. Introduction

Education and raising awareness are one of the key elements in reducing the environmental impact of an ever-increasing population (Dimante et al., 2016). Korea's total population is 51.53 million, and 47.29 million people are living in urban areas. Therefore, the urbanization ratio of Korea is 91.79%. The urban population has been constantly increasing by 5.88% each year since 1997 (MOLIT, 2018). This urbanization creates many urban problems, such as environmental disruption, eco-system damage, spreading of pollution, and the urban heat island effect (Jang, 2006). To cope with these environmental problems, restoration of eco-systems and safe foods are the top highlighted issues. As a solution measure for securing food sources and safe foods, urban agriculture is beginning to get in the spotlight as a capable measure for sustainable development and food security (Park, 2007). Thus, environmental education is essential to the future development of Korea and is emerging to the forefront as a key issue on the Korean peninsula.

One of the things the world needs is environmental education for young children. Just as a child is helped to understand his role in the classroom environment, he must also be encouraged to look beyond his immediate surroundings to the forces and conditions affecting these surroundings (Darling, 1972). Thus, environmental education is a recent emerging issue as a strong measure for solving urban problems, such as pollution, the urban heat island effect, and little to no awareness on environmental sustainability. As history shows, farming, environmental classes and programs, and urban parks have been a strong measure for solving urban problems, such as beautifying city aesthetics and decreasing environmental pollution (Bristow et al., 2009). In addition, it is also considered to have a good function of leisure and rest by experiencing the agricultural activities in nature (Lee, 2013). This approach can also be applied to the application of urban gardens. Public urban green spaces were found to play an important role for children and youths in making contacts and friends across cultures, which is considered a prerequisite for social inclusion (Klaus, 2008).

Because human interaction with ecosystem elements in cities can lead to positive and negative effects, the question of what makes a healthy urban social-ecological system, a system in which both people and the rest of nature can thrive, is important. (Lauber et al., 2012) Within the urban environment, small family gardening activities, in diverse inner-city areas, such as small urban home gardens, rooftop gardens, balcony gardens, backyard kitchen gardens, are increasing very rapidly (Lee et al., 2013). At the moment, governments started developing many community gardens in open spaces and parks, including roadsides and suburbs. Many regulations for the activation of environmentally sustainable practices were established and implemented by each local government.

In order to activate the culture of environmental sustainability, the city of Anyang hosts a plethora of environmental programs and events throughout the city. As a result, the city has proclaimed a redevelopment plan which will increase the usability as well as value of its urban parks, investing in an increased quality of life for the citizens of Anyang. This investment is projected to increase the population of Anyang residents as well. At the

moment, this research is performed in order to investigate ways to improve environmental curricula as well as general pedagogy by analyzing the satisfaction factors of students and instructors of various academic levels and educational facilities. The results of this survey can be utilized as basic data for the activation policy of environmental education as well as general education for not only the city of Anyang, but for the entire Korean peninsula.

II. Research method

1. Survey Period & Sample Group

A questionnaire survey was conducted at various institutions inclusive to daycare centers, schools, universities, trade schools, private institutes, study rooms, libraries, and community centers within the city of Anyang, from August 27, 2018 to September 26, 2018. Researcher-administered questionnaire surveys were performed with a sample group of 1000 respondents total surveyed, resulting in a final data set of 1000 respondents analyzed.

2. Design of survey form

More recent publications show that learning about ecosystems, biodiversity, or science remains a goal of many education programs in cities (Kudryavtsev et al., 2012). Current research papers were reviewed and reclassified as survey question items, for the preference of types and activities in urban agriculture and environmental education (Lee et al., 2013; Jeong et al., 2012; Jeong et al., 2013). In addition, to secure the validity of assessment tools, an expert professor examined the survey items. Sixty-three (63) question items total for the survey of improving environmental curricula and general pedagogy for Anyang citizens were prepared in Table 1. Four items of demographic characteristics and eleven items of awareness of pedagogy were presented on a nominal scale. In addition, each of the 20 items of the awareness of effects of environmental curriculum, and 28 items of the preference of types and activities of the 7 styles of pedagogy were presented on a 5-point Likert-type interval scale.

Table 1. Survey contents

Variables	Categories	Scale	No. of questions
Demographic characteristics	Occupation, residence, age, gender	Nominal	4
Awareness to curriculum and pedagogy	1) Class location 2) Cognition of classes (1) Satisfaction of classes (2) Student-teacher relationship 3) The main purpose (motivation) for classes 4) Curriculum (1) Like most (2) Like least 5) Pedagogy (1) Like most (2) Like least 6) Outdoor activities 7) Have or want pets 8) Checking academic progress	Nominal	11
Awareness on	1) Participate in health awareness events	Interval	20

effects of environmental curriculum	2) Participate in sporting events 3) Participate in home gardening 4) Community interaction and events 5) Participate in special interests meetings (hobbies and camps) 6) Join environmental leadership and training programs 7) Participate in sustainable practices 8) Join environmental fairs and exhibitions 9) Participate in horticulture healing programs 10) Participate in gardening education programs 11) Participate in healing garden and nature centers 12) Learning eco-practices in schools 13) Volunteer at animal sanctuaries 14) Participate in rooftop gardens, botanical gardens, and petting zoos 15) Volunteer in environmental clean-up 16) Support government laws for environmental equality 17) Participate in multi-generational exchanges 18) Participate in multicultural exchanges 19) Participate in camping and outdoor sporting (fishing, hiking, etc.) 20) Participate in urban agriculture (farming)		
Preference of types and activities of the 7 styles of pedagogy	1) Use images, pictures, color, and other visual media 2) Use sound, rhyme, and music 3) Involve speaking and writing techniques 4) Focus on sensations to expect in each scenario 5) Aim to understand reasons behind content and skills 6) Aim to work with others as much as possible 7) Prefer to learn alone using self-study 8) Use color, layout, spatial organization, and 'visual words' 9) Use sound recordings to provide a background for visual help 10) Make the most of word-based techniques like scripting 11) Describe the physical feelings of your actions when scripting 12) Create and use lists by extracting key points from material 13) Role playing is a technique that works well with others 14) Align goals and objectives with personal beliefs and values 15) Use mind maps 16) Set things to a jingle or song 17) Record scripts using an audio recorder for review 18) Use physical objects as much as possible 19) Association works well when it is illogical and irrational 20) Work on some of your visualizations with people 21) Highlight your thoughts and feelings when you visualize 22) Replace words with pictures 23) Play music to 'take on the world' in your mind 24) Make content dramatic when reading aloud 25) Writing and drawing as physical activities 26) Understand systems easily for the bigger picture 27) Share important facts and beliefs with others 28) Self-motivation and self-perception are mirrored	Interval	28

3. Statistical Analysis

The data, collected by questionnaire surveys, were processed by cleaning and coding for statistical analysis. Google Forms internet-based program and XLSTAT statistical data analysis software add-on for Microsoft Excel were used for the statistical analysis. Frequency analysis was used for demographic attributes of respondents, and correlation analysis was used for cognition of classes, curriculum, and pedagogy within awareness to curriculum and pedagogy. For the analysis of awareness for effects of environmental curriculum, and, preferences of type and activities of the 7 styles of pedagogy, the mean and standard deviation values of each item were compared, and the reliability tests by using Cronbach's alpha value were also performed. To verify the validity of each variable of awareness for the effects and preferences of type and activities of urban parks, exploratory factor analysis by the varimax rotation was also performed. In addition, the data was recalculated twice; forming a dendrogram containing four distinct clusters, and also forming a series of parallel plots.

Ⅲ. Results and Discussions

1. Demographics of Respondents

The items for demographic characteristics were occupation, residence, age, and gender. The results of frequency analysis for these demographic characteristics were shown in Table 2.

In occupation, the number of students (75.4%) were slightly more than 3/4 of the entire participant pool. Teachers and professors (Professionals and Technicians) were next with a combined total of 8.8%. In residence, Dongan-gu was the largest group at 48.5%, then Manan-gu at 34.7%. In age, 25 years and over was the largest group at 25.3%, with 17-19 years and 14-16 years following behind at 19.4% and 12.4% respectively. The remaining age groups were somewhat steadily dispersed. Lastly, in gender, there were more than half of female (55.2%) participants as opposed to male (44.8%) participants.

Table 2. Demographics of respondents

Variable	Categories	Freq.	%
Occupation	Self Employed	16	1.6
	Office Worker	26	2.6
	Technician	8	.8
	Student	754	75.4
	Housewife/Househusband	58	5.8
	Professional	80	8
	Unemployed	26	2.6
	Etc.	32	3.2
Residence	Manan-Gu	347	34.7
	Dongan-Gu	485	48.5
	Outside of Anyang	168	16.8
Age	4 years and under	110	11
	5-7 years	100	10
	8-13 years	107	10.7
	14-16 years	124	12.4
	17-19 years	194	19.4
	20-24 years	112	11.2
	25 years and over	253	25.3
Gender	Male	448	44.8
	Female	552	55.2
	Total	1000	100.0

2. Awareness on Pedagogy

1) Class Location

In the results of cognition to class location proximity, all eight student types selected for the study were equal at 12.5% respectively. Therefore, each class level has an equal amount of sample subjects for the study. (Fig. 1).
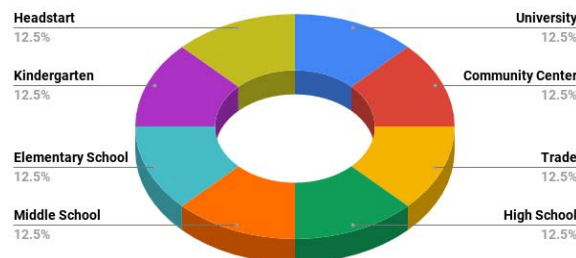

Fig. 1. Awareness of class location

2) Cognition of classes

In the results of frequency in satisfaction of classes, those in the 'Satisfied' group were 44%, and those in both the 'Neither satisfied nor dissatisfied' group and the 'Very satisfied' group were 27.6% and 23.1% respectively. Then, in the student-teacher relationship, 'Satisfied' and 'Neither satisfied nor dissatisfied' were at 34.9% and 30.7% respectively. 'Very satisfied' followed behind at 24.4%. As a result, the satisfaction level of cognition of classes is very moderate. About half of respondents answered over moderate satisfaction, with moderate following behind at nearly 30% in both cases.

Table 3. Cognition of classes

Variable	Categories	Freq.	%
Satisfaction of classes	Very dissatisfied	17	1.7
	Dissatisfied	36	3.6
	Neither satisfied nor dissatisfied	276	27.6
	Satisfied	440	44
	Very satisfied	231	23.1
Student-teacher relationship	Very dissatisfied	39	3.9
	Dissatisfied	61	6.1
	Neither satisfied nor dissatisfied	307	30.7
	Satisfied	349	34.9
	Very satisfied	244	24.4
	Total	1000	100

3) Purpose of Classes

For the purpose of classes, '...for personal growth in developing life skills.' and '...to increase intellectual knowledge on a subject.' were shown to be high frequency, 25.4% and 22.4% respectively. Following behind, '...to fulfill people's lives with activities.', '...to contribute to the community and society.', and '...to help create organization for educational development.' were shown at 14.8%, 12.6%, and 10.4% respectively. Detailed results are shown in Table 4 and Figure 2.

Table 4. Purpose of classes

Categories	Freq.	%
...to increase intellectual knowledge on a subject.	454	22.4
...for personal growth in developing life skills.	513	25.4
...to contribute to the community and society.	254	12.6
...to train people on how to conform to rules.	177	8.7
...to be able to give and follow orders.	115	5.7
...to help create organization for educational development.	211	10.4
...to fulfill people's lives with activities.	299	14.8
Total	2023	100.0

The main purpose for classes are...

...to fulfill people's lives with activities. 299
...to help create organization for 211
...to be able to give and follow orders. 115
...to train people on how to conform to 177
...to contribute to the community and 254
...for personal growth in 513
...to increase intellectual 454

Fig. 2. Purpose of Classes

4) Awareness on pedagogy

In curricula most liked in regards to curriculum and pedagogy, 'Athletics and wellness' was the highest at 33.1%. 'Electives', 'Science', and 'Mathematics' were next at 19.6%, 13.7%, and 12.2% respectively. On the other hand, curricula least liked in regards to curriculum and pedagogy were 'Mathematics', 'English', and 'Social Sciences' at 29.4%, 18.8%, and 15% respectively. And, in the source of pedagogy most liked, 'Visual-spatial' and 'Auditory-Musical' were the highest frequencies at 24.9% and 24.7% respectively. Then, 'Physical', 'Logical', and 'Social' were next at 14.8%, 11.8%, and 10.2% respectively. On the other hand, pedagogy least liked were 'Solitary', 'Verbal', and 'Logical' at 22.9%, 17.5%, and 17.4% respectively.

In nature elements such as liking outdoor activities, 'Yes' was the highest at 67.6%. Then, 'Not sure' and 'No' were next at 26.6.% and 5.8%, respectively. This means that in spite of very low interests in the sciences, the willingness to participate in outdoor activities was very high. This result could be interpreted as a very high capability of environmental education. As for interaction with living creatures, such as having or wanting pets, the 'No' was the highest at 73.5%. Then, 'Yes' and 'Not sure' were next at 22.2% and 4.3%, respectively.

Table 5. Frequency of awareness on curriculum and pedagogy (1 of 2)

Variable	Categories	Freq.	%
Curricula liked most	English (Literature, EFL, Writing)	111	11.1
	Science (Biology, Chemistry, Physics)	137	13.7
	Mathematics (Algebra, Geometry, Calculus)	122	12.2
	Social Sciences (World History, Government, Economics)	103	10.3
	Athletics and Wellness (Soccer, Basketball, Baseball)	331	33.1
	Electives (Vocational, Foreign Language, The Arts)	196	19.6

Curricula liked least	English (Literature, EFL, Writing)	188	18.8
	Science (Biology, Chemistry, Physics)	142	14.2
	Mathematics (Algebra, Geometry, Calculus)	294	29.4
	Social Sciences (World History, Government, Economics)	150	15
	Athletics and Wellness (Soccer, Basketball, Baseball)	112	11.2
	Electives (Vocational, Foreign Language, The Arts)	114	11.4
Pedagogy liked most	Visual-Spatial (Pictures, Images, Spaces)	249	24.9
	Auditory-Musical (Rhythm, Rhyme, Sound)	247	24.7
	Verbal (Speaking, Writing, Recordings)	76	7.6
	Physical (Senses, Feelings, Action)	148	14.8
	Logical (Logic, Reasoning, Systems)	118	11.8
	Social (Groups, Role-play)	102	10.2
	Solitary (Alone, Self-Study)	60	6
Pedagogy liked least	Visual-Spatial (Pictures, Images, Spaces)	88	8.8
	Auditory-Musical (Rhythm, Rhyme, Sound)	133	13.3
	Verbal (Speaking, Writing, Recordings)	175	17.5
	Physical (Senses, Feelings, Action)	88	8.8
	Logical (Logic, Reasoning, Systems)	174	17.4
	Social (Groups, Role-play)	113	11.3
	Solitary (Alone, Self-Study)	229	22.9
Outdoor activities	No	58	5.8
	Not sure	266	26.6
	Yes	676	67.6
Have or want pets	No	735	73.5
	Not sure	43	4.3
	Yes	222	22.2
	Total	1000	100.0

For checking academic progress, 'Tests/exams' was shown to be at the highest frequency of 28.5%. Following behind, 'Weekly quizzes' and 'In-class work' were shown at 18%, 15.3% respectively. Lastly, 'Individual projects' and 'Group projects' were both shown at 15.9%. Detailed results are shown in Table 6 and Figure 3.

Table 6. Frequency of awareness on curriculum and pedagogy (2 of 2)

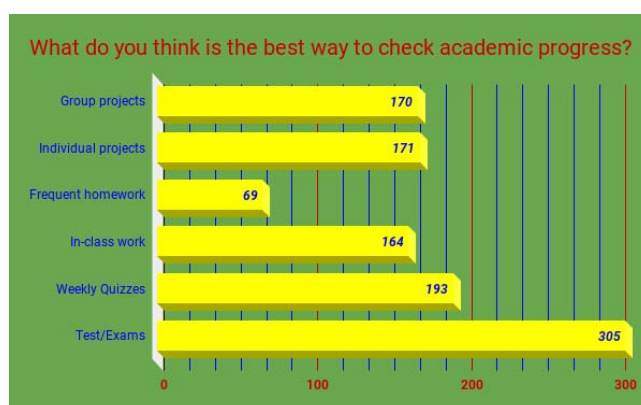|			
	Tests/Exams	305	28.5
	Weekly quizzes	193	18.0
Checking academic progress	In-class work	164	15.3
	Frequent homework	69	6.4
	Individual projects	171	15.9
	Group projects	171	15.9
	Total	1072	100.0

Fig.3.Frequency of awareness on curriculum and pedagogy (2 of 2)

3. Awareness on Effects of Environmental Pedagogy

Twenty (20) total variables for overall effects of environmental pedagogy were tested for reliability. Cronbach's α value was shown very high at 0.906, with no variable recommended to exclude. This means that the reliability of each variable was very high with a high level of internal consistency.

In the awareness on effects of environmental pedagogy, mean score of 'Participate in camping and outdoor sporting (fishing, hiking, etc.)' was the highest score at 3.86, in the 5-point Likert scale (1=strongly disagree, 5=strongly agree). Then, 'Participate in special interest meetings (hobbies and camps)' (3.81), 'Volunteer at animal sanctuaries' (3.75), 'Participate in rooftop gardens, botanical gardens, and petting zoos' (3.70), and 'Join environmental leadership and training programs' (3.70) were high-scored variables. On the other hand, cultivation of gardens, such as 'Participate in gardening education programs' (3.43) and 'Participate in home gardening' (3.41), estimated at the lowest average scores. This means that cultivation of gardens was evaluated to have not so much of significance (Table 7). These results were somewhat opposite to the precedent research, which was reported as, "urban agriculture is very beneficial leisure activity which have diverse effects, such as nature appreciation, supplying safe agricultural products, pleasure in cultivating garden products, rehabilitation of body and mind, and happiness of sharing with neighbors" (Park, 2011).

Next, an exploratory factor analysis was conducted using the validity test by the KMO (Kaiser-Meyer-Olkin). KMO value was 0.933. This means, the factor analysis is adequate and valid, verifying common factors. In the factor analysis, factors having over 1 in eigenvalue, and varimax rotation methods were adopted. Generally, the criterion for construct validity of each variable's factor loading score is over 0.5. In this result, factor loading scores of all variables were estimated to be over 0.6, thus the construct validity of variables is verified.

As the result of the rotated factor pattern, there were three (3) factors. In factor 1, 'Learning eco-practices in schools', 'Volunteer at animal sanctuaries', 'Participate in rooftop gardens, botanical gardens, and petting zoos', 'Volunteer in environmental clean-up', 'Support government laws for environmental equality', 'Participate in multi-generational exchanges', 'Participate in multicultural exchanges', 'Participate in camping and outdoor sporting (fishing, hiking, etc.)', and 'Participate in urban agriculture (farming)' were categorized. Therefore, factor 1 was named 'Environmental improving effects'. In factor 2, 'Participate in home gardening', 'Join environmental fairs and exhibitions', 'Participate in horticulture healing programs', 'Participate in gardening education programs', and 'Participate in healing garden and nature centers' were categorized. Thus, factor 2 was named 'Cultivation of gardens'. In factor 3, 'Participate in health awareness', 'Participate in sporting events', 'Community interaction and events', 'Participate in special interests meetings (Hobbies and camps)', 'Join environmental leadership and training programs', and 'Participate in sustainable practices' were categorized. Thus, factor 3 was named 'Participation in experiencing/education programs'. The percent of factor 1 for total variance was 15.96%, factor 2 was 12.46%, and factor 3 was 13.28%. Cumulative variance of total factors was 47.70% (Table 7).

Table 7. Cognition of effects of environmental pedagogy

Component		Factor Loadings	α	Eigen value	% of Variance	Communality	M±SD[z]
Factor1	Learning eco-practices in schools	.423				.356	3.53±0.89
	Volunteer at animal sanctuaries	.604				.400	3.75±0.96
	Participate in rooftop gardens, botanical gardens, and petting zoos	.592				.453	3.70±0.90
	Volunteer in environmental clean-up	.608				.476	3.56±0.91
	Support government laws for environmental equality	.508	.849	6.633	15.96	.381	3.61±0.90
	Participate in multi-generational exchanges	.495				.407	3.67±0.91
	Participate in multicultural exchanges	.532				.398	3.68±0.93
	Participate in camping and outdoor sporting (fishing, hiking, etc.)	.552				.393	3.86±0.94
	Participate in urban agriculture (farming)	.502				.347	3.66±0.98
Factor2	Participate in home gardening	.456				.383	3.41±0.93
	Join environmental fairs and exhibitions	.514				.410	3.55±0.90
	Participate in horticulture healing programs	.660	.804	.907	12.46	.511	3.54±0.96
	Participate in gardening education programs	.741				.613	3.43±0.96
	Participate in healing garden and nature centers	.594				.498	3.55±0.97
Factor3	Participate in health awareness events	.532				.343	3.68±0.86
	Participate in sporting events	.537				.353	3.76±0.92
	Community interaction and events	.594				.410	3.56±0.84
	Participate in special interests meetings (hobbies and camps)	.562	.784	.800	13.28	.410	3.81±0.91
	Join environmental leadership and training programs	.536				.435	3.70±0.88
	Participate in sustainable practices	.489				.365	3.68±0.88

[z]Mean±Standard Deviation

Cumulative % = 47.70, KMO = .933

Mean = Average value of 5-point Likert Scale (1=strongly disagree, 5=strongly agree)

4. Preference in type and activities of the 7 styles of learning

Twenty-eight (28) total variables for preference in type and activities of the 7 styles of learning were tested for reliability. Cronbach's α value was shown very high at 0.919, with no variable recommended to exclude. This means that the reliability of each variable was very high with a high level of internal consistency.

In the awareness on preference in type and activities of the 7 styles of learning, mean score of 'Use images, pictures, color, and other visual media' was the highest score at 3.92, in the 5-point Likert scale (1=strongly disagree, 5=strongly agree). Then, 'Use sound, rhyme, and music' (3.81), 'Role-playing is a technique that works well with others' (3.75), and 'Highlighting your thoughts and feelings when you visualize' (3.70) were high-scored variables. On the other hand, emotional learning, such as 'Set things to a jingle or song'

(3.15) and 'Association works well when it is illogical and irrational' (3.14), estimated at the lowest average scores. This means that emotional learning was evaluated to have not so much of significance (Table 7).

Next, an exploratory factor analysis was conducted using the validity test by the KMO (Kaiser-Meyer-Olkin). KMO value was 0.934. This means, the factor analysis is adequate and valid, verifying common factors. In the factor analysis, factors having over 1 in eigenvalue, and varimax rotation methods were adopted. Generally, the criterion for construct validity of each variable's factor loading score is over 0.5. In this result, factor loading scores of all variables were estimated to be over 0.6, thus the construct validity of variables is verified.

As the result of the rotated factor pattern, there were three (3) factors. In factor 1, 'Involve speaking and writing techniques', 'Focus on sensations to expect in each scenario', 'Use color, layout, spatial organization, and 'visual words'', 'Create and use lists by extracting key points from material', 'Align goals and objectives with personal beliefs and values', 'Use mind maps', 'Understand systems easily for the bigger picture', 'Share important facts and beliefs with others', 'Self-motivation and self-perception are mirrored' were categorized. Therefore, factor 1 was named 'Analytical Learner'. In factor 2, 'Sets things to a jingle or song', 'Record scripts using an audio recorder for review', 'Use physical objects as much as possible', 'Association works well when it is illogical and irrational', 'Work on some of your visualizations with other people', 'Replace words with pictures', 'Play music to 'take on the world' in your mind', and 'Make content dramatic when reading aloud' were categorized. Thus, factor 2 was named 'Emotional Learner'. In factor 3, 'Uses images, pictures, color, and other visual media', 'Use sound, rhyme, and music', 'Aim to understand reasons behind content and skills', 'Aim to work with others as much as possible', 'Prefer to learn alone using self-study', 'Use sound recordings to provide a background for visual help', 'Make the most of word-based techniques like scripting', 'Describe the physical feelings of your actions when scripting', and 'Role-playing is a technique that works well with others' were categorized. Thus, factor 3 was named 'Investigative Learner'. The percent of factor 1 for total variance was 13.42%, factor 2 was 11.18%, and factor 3 was 13.56%. Cumulative variance of total factors was 38.16% (Table 8).

Table 8. Preference of types and activities of the 7 styles of pedagogy

	Measurement item	Factor Loadings	α	Eigen value	% of Variance	Communality	M±SD^z
Factor1	Involve speaking and writing techniques	.472				.368	3.52±0.88
	Focus on sensations to expect in each scenario	.536				.483	3.54±0.88
	Use color, layout, spatial organization, and 'visual words'	.412				.381	3.55±0.85
	Create and use lists by extracting key points from material	.466				.548	3.56±0.88
	Align goals and objectives with personal beliefs and values	.448	.840	8.293	13.42	.366	3.67±0.85
	Use mind maps	.527				.425	3.47±0.91
	Understand systems easily for the bigger picture	.502				.523	3.66±0.85
	Share important facts and beliefs with others	.586				.479	3.64±0.88
	Self-motivation and self-perception are mirrored	.648				.491	3.58±0.94
Factor2	Sets things to a jingle or song	.527				.444	3.15±0.97
	Record scripts using an audio recorder for review	.634				.526	3.46±1.00
	Use physical objects as much as possible	.504				.397	3.50±0.89
	Association works well when it is illogical and irrational	.551				.330	3.14±0.99
	Work on some of your visualizations with other people	.452	.820	1.381	11.18	.400	3.40±0.90
	Replace words with pictures	.351				.316	3.60±0.93
	Play music to 'take on the world' in your mind	.631				.516	3.35±0.99
	Make content dramatic when reading aloud	.584				.516	3.40±1.01
Factor3	Use images, pictures, color, and other visual media	.713				.626	3.92±0.85
	Use sound, rhyme, and music	.483				.428	3.81±0.84
	Aim to understand reasons behind content and skills	.506				.425	3.69±0.84
	Aim to work with others as much as possible	.420				.313	3.69±0.85
	Prefer to learn alone using self-study	.235				.155	3.37±0.92
	Use sound recordings to provide a background for visual help	.510	.829	1.010	13.56	.371	3.61±0.89
	Make the most of word-based techniques like scripting	.457				.456	3.59±0.88
	Describe the physical feelings of your actions when scripting	.426				.446	3.54±0.85
	Role-playing is a technique that works well with others	.507				.376	3.75±0.89
	Highlighting your thoughts and feelings when you visualize	.411				.381	3.70±0.90
	Writing and drawing as physical activities	.546				.477	3.67±0.90

^zMean±Standard Deviation

Cumulative % = 38.16, KMO = .934

Mean=Average value of 5-point Likert Scale (1=not at all prefer, 5=very highly prefer)

5. Correlation Analysis of Students by Class Satisfaction and Satisfaction with Nature

A correlation analysis was conducted to determine whether there is a correlation between the components of possible continuity. A factor analysis was performed on the four variables (Table 9), and then a correlation analysis was performed. The results of the correlation analysis between variables are shown in the correlations table (Table 10). As a result of the correlation analysis, the correlations between the four components were analyzed. Where 'Class satisfaction' and 'Student-teacher' intersect, as well as where 'Class satisfaction' and 'Like outdoors' intersect, the Pearson correlation coefficient has a p-value of <0.0001. Next, where 'Like outdoors' and 'Student-teacher' intersect, the Pearson correlation coefficient has a p-value of 0.000. Where 'Have or want pets' and 'Like outdoors' intersect, the Pearson correlation coefficient has a p-value of 0.085. Also, where 'Have or want pets' and 'Student-teacher' intersect, the Pearson correlation coefficient has a p-value of 0.224. Lastly, where 'Have or want pets' and 'Like outdoors' intersect, the Pearson correlation coefficient has a p-value of 0.641. The significance level of this correlation analysis is 0.05, which make it a meaningful analysis. Although the correlation between 'Class satisfaction' and 'Student-teacher' is much stronger, the four variables are not strongly correlated with each other, indicating a more insignificant positive and negative correlation.

Table 9. Descriptive Correlation Analysis of Class Satisfaction and Satisfaction with Nature

Variables	N	M±SD^z
Are you satisfied with your classes?	1000	3.83±0.88
How would you describe your student-teacher relationships in your classes?	1000	3.70±1.03
Do you like outdoor activities?	1000	4.24±1.19
Do you have/want any pets?	1000	1.97±1.67

N=Number of observations

^{z}Mean±Standard Deviation

Mean=Average value of 5-point Likert Scale (1=not at all prefer, 5=very highly prefer)

Table 10. Correlation Analysis of Class Satisfaction and Satisfaction with Nature

		Class Satisfaction	Student-Teacher	Like Outdoors	Have or Want Pets
Class Satisfaction	Pearson Correlation	1**	0.398**	0.160**	0.015
	Sig. (2-tailed)	0**	< 0.0001**	< 0.0001**	0.641
	N	1000	1000	1000	1000
Student-Teacher	Pearson Correlation	0.398**	1**	0.111**	-0.038
	Sig. (2-tailed)	< 0.0001**	0**	0.000**	0.224
	N	1000	1000	1000	1000
Like Outdoors	Pearson Correlation	0.160**	0.111**	1**	-0.055
	Sig. (2-tailed)	< 0.0001**	0.000**	0**	0.085
	N	1000	1000	1000	1000
Have or Want Pets	Pearson Correlation	0.015**	-0.038	-0.055**	1**
	Sig. (2-tailed)	0.641	0.224	0.085	0**
	N	1000	1000	1000	1000

** Correlations are different from 0 and significant at 0.05level (2-tailed).

6. Cluster and Parallel Analysis of Students by Curriculum and Pedagogical Factors

A cluster analysis and multiple parallel analyses on environmental curriculum and pedagogy were performed on 1000 participants, consisting of both students and instructors, and established on fifty-six (56) variables. Based on the minimum distance to the initial cluster, the distribution of four (4) clusters in the dendrogram showed distinct differences in the characteristics of the fifty-six variables from the survey questionnaires (Figure 4 and Table 11).
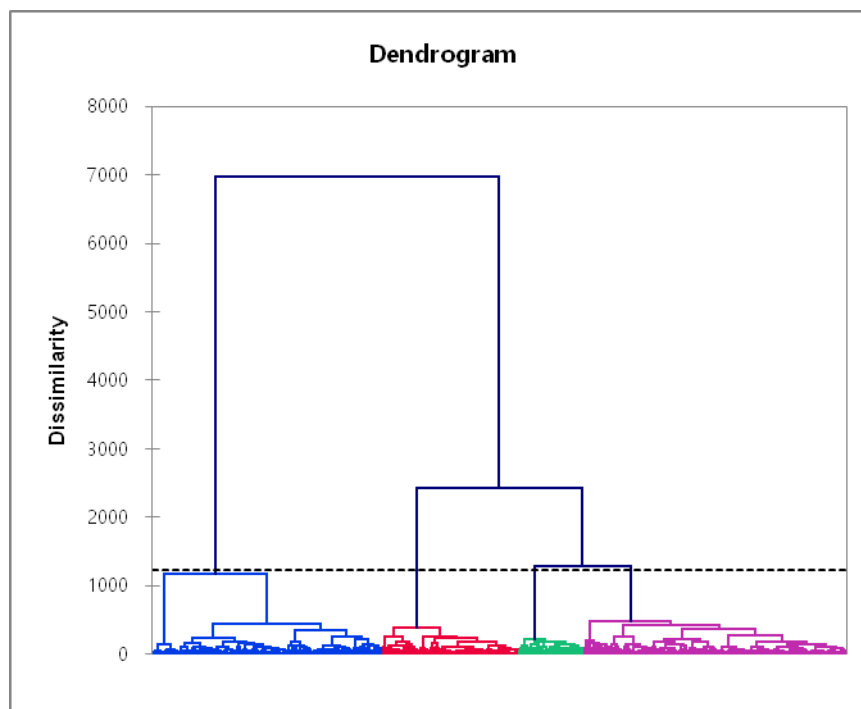

Fig. 4. Dendrogram of Participant Profiles

*Corresponding brackets were color coded according to the variable plot points table.

Table 11. Parallel Analysis Variable Plot Points of Participant Profiles (Left to Right)

Variable Plot Points	Cluster 1 N=378 Mean	Cluster 2 N=195 Mean	Cluster 3 N=333 Mean	Cluster 4 N=94 Mean
Participate in health awareness events	3.61	3.10	4.11	3.69
Participate in sporting events	3.64	3.16	4.19	3.90
Participate in home gardening	3.31	2.80	3.84	3.51
Community interaction and events	3.53	3.00	4.00	3.23
Participate in special interests meetings (hobbies and camps)	3.69	3.12	4.23	4.28
Join environmental leadership and training programs	3.60	3.01	4.17	3.89
Participate in sustainable practices	3.61	3.04	4.14	3.50
Join environmental fairs and exhibitions	3.41	2.94	4.08	3.55
Participate in horticulture healing programs	3.22	2.90	4.04	4.40
Participate in gardening education programs	3.26	2.81	3.90	3.82
Participate in healing garden and nature centers	3.43	2.81	4.05	3.80
Learning eco-practices in schools	3.40	2.91	4.05	3.57
Volunteer at animal sanctuaries	3.60	3.11	4.20	4.04
Participate in rooftop gardens, botanical gardens, and petting zoos	3.62	3.00	4.16	3.90
Volunteer in environmental clean-up	3.56	2.77	3.99	3.69
Support government laws for environmental equality	3.53	2.95	4.05	3.78
Participate in multi-generational exchanges	3.50	2.86	4.14	4.35
Participate in multicultural exchanges	3.60	2.96	4.25	3.51
Participate in camping and outdoor sporting (fishing, hiking, etc.)	3.83	3.13	4.35	3.73
Participate in urban agriculture (farming)	3.62	2.84	4.22	3.51
Use images, pictures, color, and other visual media	3.78	3.28	4.23	4.77
Use sound, rhyme, and music	3.72	3.31	4.24	3.87
Involve speaking and writing techniques	3.50	2.88	3.96	3.32
Focus on sensations to expect in each scenario	3.53	2.91	4.01	3.23
Aim to understand reasons behind content and skills	3.57	3.08	4.11	3.94
Aim to work with others as much as possible	3.55	3.10	4.12	3.94
Prefer to learn alone using self-study	3.28	3.01	3.67	3.43
Use color, layout, spatial organization, and 'visual words'	3.48	3.00	4.02	3.28
Use sound recordings to provide a background for visual help	3.43	3.04	4.00	4.15
Make the most of word-based techniques like scripting	3.43	3.00	4.06	3.80
Describe the physical feelings of your actions when scripting	3.40	2.95	4.05	3.54
Create and use lists by extracting key points from material	3.46	2.94	4.05	3.45
Role playing is a technique that works well with others	3.53	3.06	4.20	4.50
Align goals and objectives with personal beliefs and values	3.58	3.07	4.15	3.61
Use mind maps	3.37	2.85	4.11	2.88

Set things to a jingle or song	3.04	2.70	3.82	2.16
Record scripts using an audio recorder for review	3.17	2.95	3.89	4.20
Use physical objects as much as possible	3.27	2.96	3.98	3.86
Association works well when it is illogical and irrational	2.95	2.72	3.57	3.25
Work on some of your visualizations with people	3.28	2.86	3.95	3.02
Highlight your thoughts and feelings when you visualize	3.51	3.03	4.16	4.29
Replace words with pictures	3.51	2.99	4.08	3.55
Play music to 'take on the world' in your mind	3.12	2.84	4.02	2.94
Make content dramatic when reading aloud	3.21	2.91	4.05	2.88
Writing and drawing as physical activities	3.36	3.09	4.10	4.56
Understand systems easily for the bigger picture	3.48	3.07	4.23	3.57
Share important facts and beliefs with others	3.56	3.05	4.17	3.20
Self-motivation and self-perception are mirrored	3.52	2.99	4.23	2.81
Are you satisfied with your classes?	3.62	3.63	4.08	4.21
How would you describe your student-teacher relationships in your classes?	3.50	3.39	3.88	4.50
Which general subjects do you like the most?	4.25	3.93	3.92	3.38
Which general subjects do you like the least?	3.00	3.27	3.25	3.66
Which style of learning do you prefer the most?	3.17	3.28	2.94	3.93
Which style of learning do you prefer the least?	4.46	4.39	4.52	3.59
Do you like outdoor activities?	4.18	3.95	4.35	4.64
Do you have/want any pets?	2.02	2.31	1.98	1.06

^{z}Mean

Mean=Average value of 5-point Likert Scale (1=not at all prefer, 5=very highly prefer)

*General Subjects and Styles of Learning were assigned numerical values of 1 to 6 and 1 to 7 respectively.

*Corresponding mean columns were color coded according to the dendrogram.

*Corresponding variable plot point column was color coded according to the parallel diagram plot points.

A parallel analysis of the dendrogram showed four distinct learning profiles (Figure 5). Of the total participants, cluster 1 has 378 members which had moderate environmental engagement in relation to environmental curriculum and pedagogy. In regards to curriculum, the highest engagement mean point was 'Participate in camping and outdoor sporting (fishing, hiking, etc.)' (3.83), and the lowest engagement mean point was 'Participate in horticulture healing programs' (3.22). In regards to pedagogy, the highest engagement mean point was 'Use images, pictures, color, and other visual media' (3.78), and the lowest engagement mean point was 'Association works well when it is illogical and irrational' (2.95). Cluster 2 has 195 members which had low environmental engagement in relation to environmental curriculum and pedagogy. In regards to curriculum, the highest engagement mean point was 'Participate in sporting events' (3.16), and the lowest engagement mean point was 'Volunteer in environmental clean-up' (2.77). In regards to pedagogy, the highest engagement mean point was 'Use sound, rhyme, and music' (3.31), and the lowest engagement mean point was 'Set things to a jingle or song' (2.70). Cluster 3 has 333 members which had high environmental engagement in relation to environmental curriculum and pedagogy. In regards to curriculum, the highest engagement mean point was 'Participate in camping and outdoor sporting (fishing, hiking, etc.)' (4.35), and the lowest engagement mean point was 'Participate in home

gardening' (3.84). In regards to pedagogy, the highest engagement mean point was 'Use sound, rhyme, and music' (4.24), and the lowest engagement mean point was 'Association works well when it is illogical and irrational' (3.57). Lastly, Cluster 4 has 94 members which had arbitrary environmental engagement in relation to environmental curriculum and pedagogy. In regards to curriculum, the highest engagement mean point was 'Participate in horticulture healing programs' (4.40), and the lowest engagement mean point was 'Community interaction and events' (3.23). In regards to pedagogy, the highest engagement mean point was 'Use images, pictures, color, and other visual media' (4.77), and the lowest engagement mean point was 'Set things to a jingle or song' (2.16).

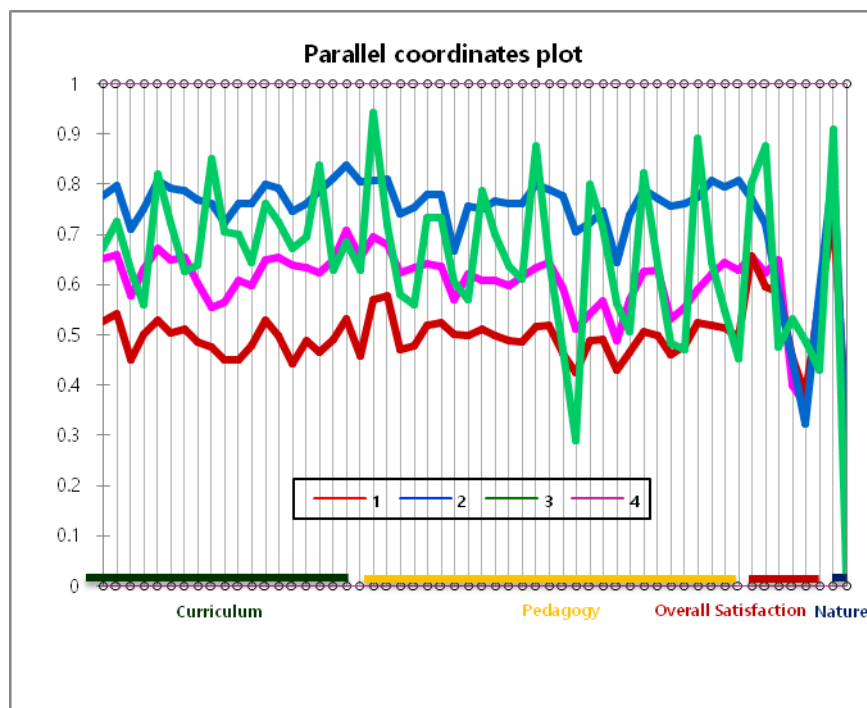

Fig. 5. Parallel Analysis of Participant Profiles by Clusters

*Corresponding parallel coordinates were color coded according to the dendrogram.

*The extreme spikes in plot point values of Overall Satisfaction and Nature plot points are due to them being nominal values and not interval values.

7. Other Relevant Parallel Analyses of Students by Demographics

Collaboration across different disciplines can alter the frameworks and formal boundaries of traditional knowledge areas. Potential for challenging the traditional knowledge paradigms can stem from trans-disciplinary collaboration (Gough et al., 2016). Thus, other parallel analyses were performed to show multiple variations of groups to compare and contrast for the purpose of gaining further insight into the 1000 participants selected for the study. Multiple parallel analyses were performed and categorized by academic level, occupation, residence, age, and gender. The mean and standard deviation were acquired to properly identify the plot point values for the various parallel analyses (Table 12 and Figures 6-10). The observation counts, plus the minimum and maximum interval values were acquired as well. The highest engagement mean and standard deviation variable of total participants in

regards to curriculum, was 'Hobbies and camps' (3.81±0.91), and the lowest engagement mean and standard deviation variable was 'Participate in home gardening' (3.41±0.93). In regards to pedagogy, the highest engagement mean and standard deviation variable was 'Use images, pictures, color, and other visual media' (3.92±0.85), and the lowest engagement mean and standard deviation variable was 'Association works well when it is illogical and irrational' (3.14±0.99) (Table 12).

Table 12. Parallel Analysis Variable Plot Points of Participant Profiles (Left to Right)

Variable Plot Points	Observ	Min	Max	M±SD^z
Participate in health awareness events	1000	1	5	3.68±0.86
Participate in sporting events	1000	1	5	3.76±0.92
Participate in home gardening	1000	1	5	3.41±0.93
Community interaction and events	1000	1	5	3.56±0.84
Participate in special interests meetings (hobbies and camps)	1000	1	5	3.81±0.91
Join environmental leadership and training programs	1000	1	5	3.70±0.88
Participate in sustainable practices	1000	1	5	3.67±0.88
Join environmental fairs and exhibitions	1000	1	5	3.55±0.90
Participate in horticulture healing programs	1000	1	5	3.54±0.96
Participate in gardening education programs	1000	1	5	3.43±0.96
Participate in healing garden and nature centers	1000	1	5	3.55±0.97
Learning eco-practices in schools	1000	1	5	3.53±0.89
Volunteer at animal sanctuaries	1000	1	5	3.75±0.96
Participate in rooftop gardens, botanical gardens, and petting zoos	1000	1	5	3.70±0.90
Volunteer in environmental clean-up	1000	1	5	3.56±0.91
Support government laws for environmental equality	1000	1	5	3.61±0.90
Participate in multi-generational exchanges	1000	1	5	3.67±0.91
Participate in multicultural exchanges	1000	1	5	3.68±0.93
Participate in camping and outdoor sporting (fishing, hiking, etc.)	1000	1	5	3.86±0.94
Participate in urban agriculture (farming)	1000	1	5	3.66±0.98
Use images, pictures, color, and other visual media	1000	1	5	3.92±0.85
Use sound, rhyme, and music	1000	1	5	3.83±0.84
Involve speaking and writing techniques	1000	1	5	3.52±0.88
Focus on sensations to expect in each scenario	1000	1	5	3.54±0.88
Aim to understand reasons behind content and skills	1000	1	5	3.69±0.84
Aim to work with others as much as possible	1000	1	5	3.67±0.85
Prefer to learn alone using self-study	1000	1	5	3.37±0.92
Use color, layout, spatial organization, and 'visual words'	1000	1	5	3.55±0.85
Use sound recordings to provide a background for visual help	1000	1	5	3.61±0.89
Make the most of word-based techniques like scripting	1000	1	5	3.59±0.88
Describe the physical feelings of your actions when scripting	1000	1	5	3.54±0.85
Create and use lists by extracting key points from material	1000	1	5	3.56±0.88

Role playing is a technique that works well with others	1000	1	5	3.75±0.89
Align goals and objectives with personal beliefs and values	1000	1	5	3.67±0.85
Use mind maps	1000	1	5	3.47±0.91
Set things to a jingle or song	1000	1	5	3.15±0.97
Record scripts using an audio recorder for review	1000	1	5	3.46±1.00
Use physical objects as much as possible	1000	1	5	3.46±0.89
Association works well when it is illogical and irrational	1000	1	5	3.14±0.99
Work on some of your visualizations with people	1000	1	5	3.40±0.90
Highlight your thoughts and feelings when you visualize	1000	1	5	3.70±0.90
Replace words with pictures	1000	1	5	3.60±0.93
Play music to 'take on the world' in your mind	1000	1	5	3.35±0.99
Make content dramatic when reading aloud	1000	1	5	3.40±1.01
Writing and drawing as physical activities	1000	1	5	3.67±0.90
Understand systems easily for the bigger picture	1000	1	5	3.66±0.85
Share important facts and beliefs with others	1000	1	5	3.64±0.88
Self-motivation and self-perception are mirrored	1000	1	5	3.58±0.94
Are you satisfied with your classes?	1000	1	5	3.83±0.88
How would you describe your student-teacher relationships in your classes?	1000	1	5	3.70±1.03
*Which general subjects do you like the most?	1000	1	6	3.99±1.67
*Which general subjects do you like the least?	1000	1	6	3.20±1.58
*Which style of learning do you prefer the most?	1000	1	7	3.19±1.93
*Which style of learning do you prefer the least?	1000	1	7	4.38±2.01
Do you like outdoor activities?	1000	1	5	4.24±1.19
Do you have/want any pets?	1000	1	5	1.97±1.67

^{z}Mean±Standard Deviation

Mean=Average value of 5-point Likert Scale (1=not at all prefer, 5=very highly prefer)

*Corresponding variable plot point column was color coded according to the parallel diagram plot points.

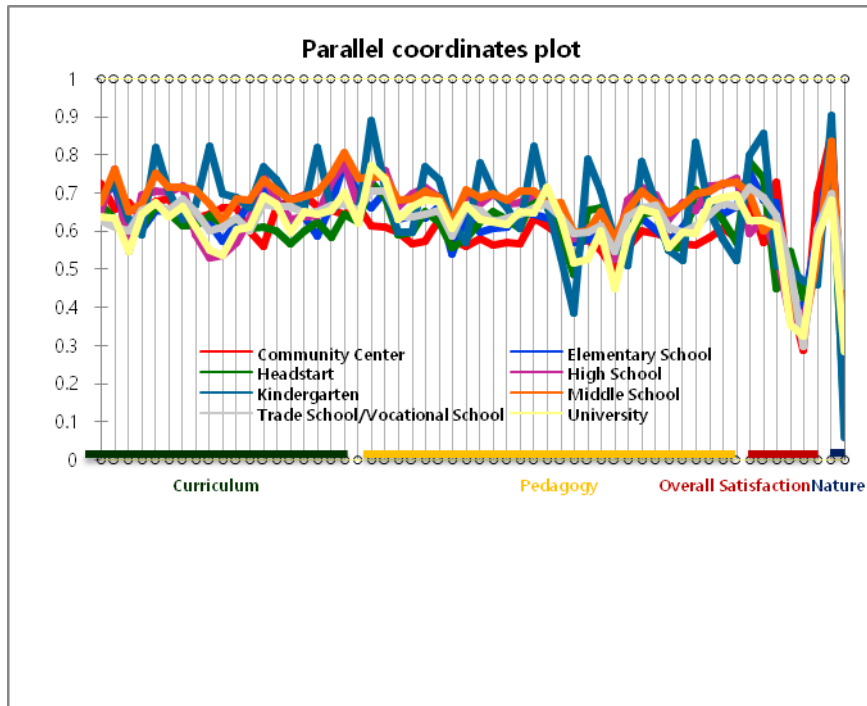*General Subjects and Styles of Learning were assigned numerical values of 1 to 6 and 1 to 7 respectively.

Fig. 6. Parallel Analysis of Participant Profiles by Academic Level

*The extreme spikes in plot point values of Overall Satisfaction and Nature plot points are due to them being nominal values and not interval values.
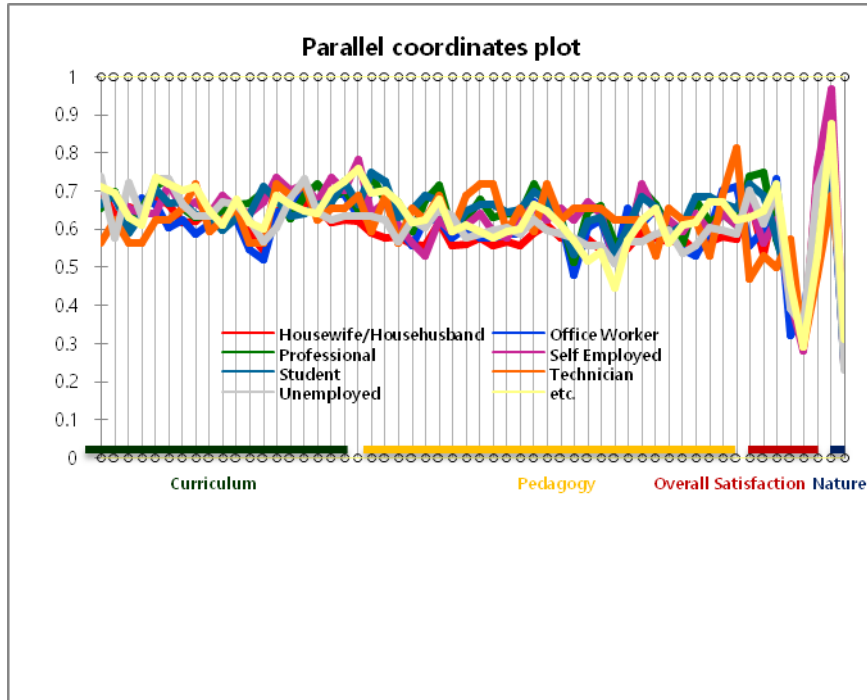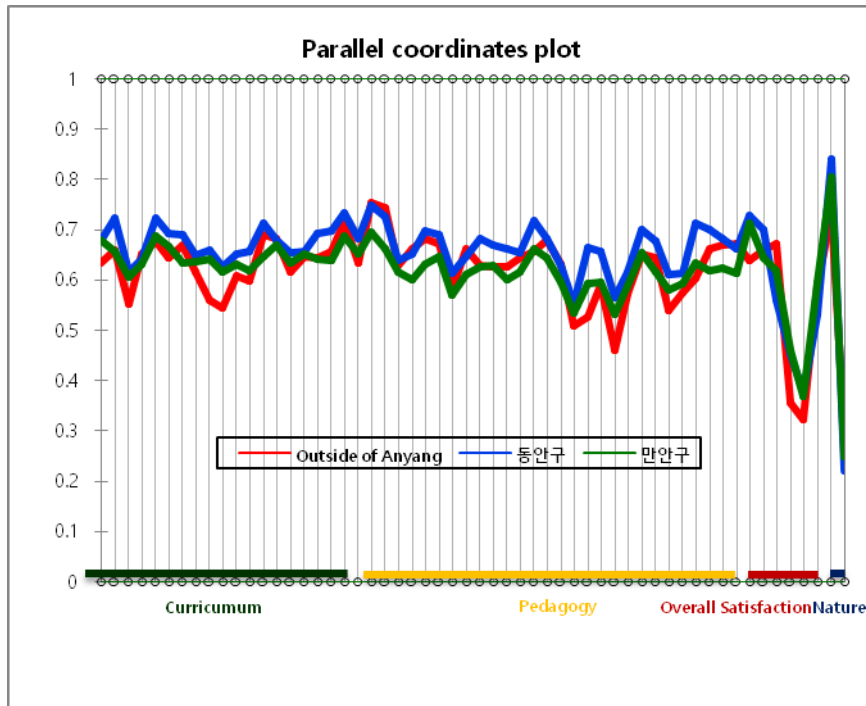

Fig. 7. Parallel Analysis of Participant Profiles by Occupation

*The extreme spikes in plot point values of Overall Satisfaction and Nature plot points are due to them being nominal values and not interval values.
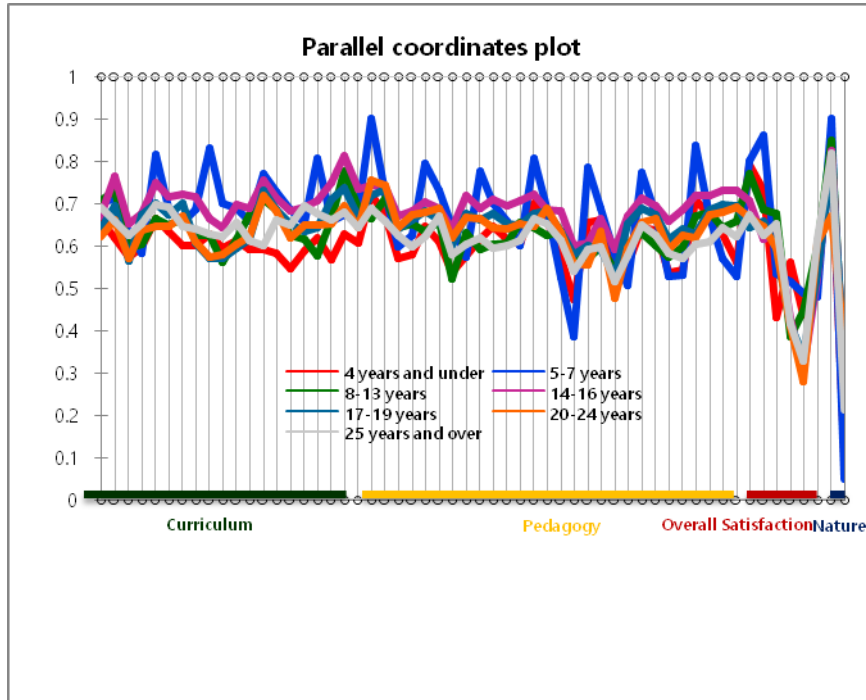
Fig. 8. Parallel Analysis of Participant Profiles by Residence

*The extreme spikes in plot point values of Overall Satisfaction and Nature plot points are due to them being nominal values and not interval values.

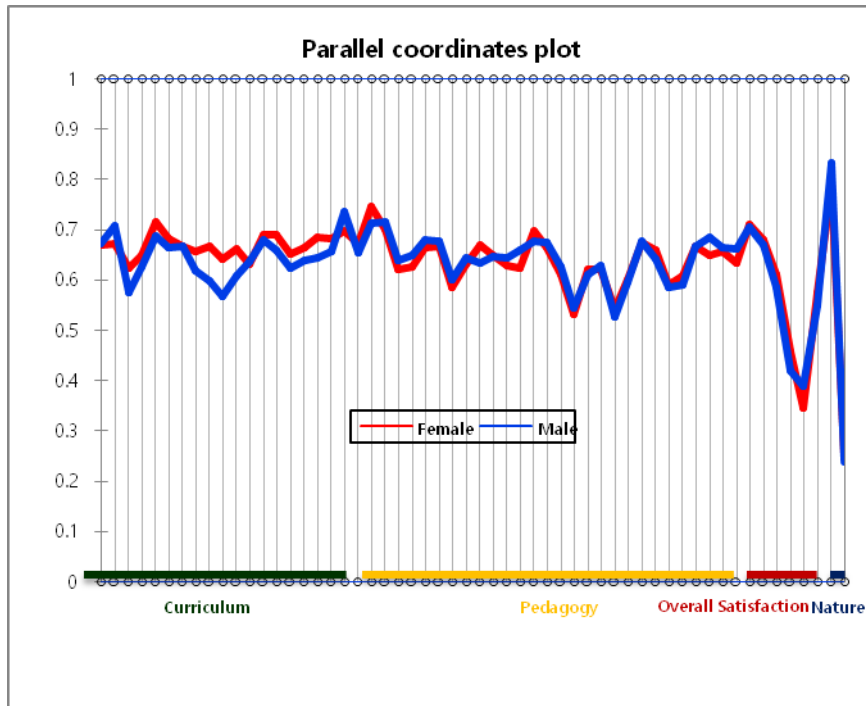Fig. 9. Parallel Analysis of Participant Profiles by Age

*The extreme spikes in plot point values of Overall Satisfaction and Nature plot points are due to them being nominal values and not interval values.

Fig. 10. Parallel Analysis of Participant Profiles by Gender

*The extreme spikes in plot point values of Overall Satisfaction and Nature plot points are due to them being nominal values and not interval values.

Summary

The purpose of this study was to investigate ways to improve environmental curricula and local pedagogy by analyzing the satisfaction factors of student and instructors of various educational facilities in Anyang, South Korea. A survey questionnaire was conducted for 30 days from August 27, 2018 to September 26, 2018, for a sample group consisting of 1,000 participants in Anyang. The survey questionnaire investigated various curricula and the educational, recreational, social, and environmental effects of pedagogy while studying the spatial, service, environmental, and policy factors of its corresponding facilities for both students and instructors.

The cognitions of 'Awareness to curriculum and pedagogy' were analyzed. The cognitions of the purpose of taking classes were dispersed somewhat steadily among possible selections with '...for personal growth in developing skills.' set at the highest frequency, and '...to be able to give and follow orders.' set at the lowest frequency. In addition, class satisfaction was moderately set at above average frequency, while the above average frequency of student-teacher relationships was set moderately lower than class satisfaction's above average frequency. In regards to curriculum and pedagogy satisfaction, the frequencies of both were set somewhat steadily. 'Athletics and wellness' was the most liked, while 'Mathematics' was the least liked. In addition, 'Visual spatial' and 'Auditory-musical' was the most liked, while 'Solitary' study was the least liked. Then, in 'Checking academic progress', 'Tests/exams' was set at the highest frequency, while 'Frequent homework' was set at the lowest frequency. In regards to fondness of nature and pets, 'Outdoor activities' was set at a significantly high

frequency of approval, while 'Have or want pets' was set at a significantly low frequency of approval. Thus, the potential capability of environmental curricula improvements and general pedagogical improvements is very strong. In cognition towards the awareness on effects of environmental pedagogy, 'Participate in camping and outdoor sporting (fishing, hiking, etc.)' and 'Participate in special interest meetings (hobbies and camps)' were shown to be in high points of agreement. Furthermore, in preference of the types and activities of the 7 styles of pedagogy, 'Use images, pictures, color and other visual media', 'Use sound, rhyme, and music', 'Role-playing is a technique that works well with others', and 'Highlighting your thoughts and feelings when you visualize' were shown to be highly preferred types. Within the awareness on effects of environmental pedagogy, the four (4) factors were categorized as; 'Environmental improving effects', 'Cultivation of gardens', and 'Participation in experiencing/education programs' respectfully. In addition, the three (3) factors were prevalent in types and activities of the 7 styles of pedagogy, thus categorized as 'Analytical Learner', 'Emotional Learner', and 'Investigative Learner'.

In addition to conducting a correlation analysis to determine the correlation between the preference of class satisfaction and satisfaction with nature responses for possible continuity, further research analytics rearranged the acquired data into two (2) additional forms of data output consisting of clusters and parallel plot groups. There were four (4) distinct clusters created from a dendrogram that grouped each participant's profile according to fifty-six (56) of their cumulative survey questionnaire responses. Within the dendrogram of participant profiles, the four clusters were categorized as; 'Low environmental engagement', 'Moderate environmental engagement', 'High environmental engagement', and 'Arbitrary environmental engagement' with respect to environmental curriculum and pedagogy. Furthermore, the dendrogram data was converted to a series parallel plot points groups. Moreover, five (5) additional parallel plot groups were created and categorized by academic level, occupation, residence, age, and gender respectively.

In conclusion, although the current situation of the city of Anyang is in the stages of major urban redevelopment, the potential overall effects of environmental education in Anyang are great. In the future, a diverse plethora of programs, such as diverse education/experiencing programs and information supporting programs can be applied to future curriculum and pedagogical development. In addition, the results of this study can be used as basic material for studying environmental awareness and directions of improvement for environmental education and pedagogy in the future.

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