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Study the Current and Optimal Status of Teaching Environment at High Schools with Emphasis on Curriculum Experts and Teachers Viewpoints

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Abstract

The purpose of present research was to study the current and optimal status of teaching environment at high schools in Iran with emphasis on curriculum experts and teachers viewpoints. Research method was mixed method. In the qualitative part, experts viewpoints were gathered through a semi-structured interview. In the quantitative part, 258 high school teachers were selected randomly as statistical sample and a researcher-made questionnaire was distributed among them to collect data. Content validity was used to determine the questionnaire validity, and its reliability was calculated at 0.90, using Cronbach at alpha coefficient. Findings showed that, according to experts' viewpoints, status of teaching environment at high schools is not desirable. Also, findings suggest that best teaching method for environment in Iran is a blended-electronic, project-oriented, teaching practical skills in open spaces. Iranian teachers chose teaching methods to teach environmental not only to promote their knowledge but also affect the attitude and skills of environmental protection and creating environmental conduct.

Keywords: curriculum experts, environmental experts, high school, Iran, teacher, teaching method

1. Introduction

Much of damages to the environment by human are rooted in the man's unawareness and school is the best place to increase environmental awareness and solve its problems (Erdogan et al., 2014). The objective of teaching environmental issues is developing knowledge, attitude, skill, valued and commitment to solve environmental problems (Sola, 2014). Studies have shown that teaching methods have direct relationship with creativity (Adibnia, 2013; Reyaz, 2011), and the key element in teaching and learning is the ability to process information. In this regard and academic revolution has taken place in education in the past half century marked by transformations in scope and diversity. Hence, schools must serve students-as institution devoted to teaching and learning methods that purpose students to face multiple and diverse challenges, make sound decisions, and dealing constructively with them.

According to structuralism, knowledge should be made by the learners. Several studies have emphasized the effectiveness of structuralism approach in teaching. Aizene et al have pointed out that those teaching method concentrate on learning theories which depreciate the role of students in learning are not accepted any longer (Abedini & Nili, 2014). Aizener suggest that what school should teach students is the manner of thinking and learning, able to consider various ways while facing problems, and address how collecting different pieces of information and organize them in a new and modern from studies suggest that teaching method selected by teacher is effective on the speed and stability of learning and increasing cognitive, affective, and communicational skills in students (Farhadi-Pour et al., 2015).

Kotovaz and Atasoy (2008) believe that participatory teaching method causes nurturing critical view, social participation and interpersonal communication. Rai Singh and Abdul Rahman (2012) stated that project-oriented teaching method is a self-stimulated method and nurtures the students as aware and concerned about the environmental future. Project-oriented teaching method makes the students ready for leadership in protecting the environment in the future. Preston (2014), In his study states that teaching in open space which is a type of

adventurous teaching causes nurturing environmental conduct and the application of leadership techniques. This teaching method not only leads to the students' improvement of environmental literacy and their understanding from the environment; but it also positively affects the students' attitude toward the environment in turn (Cavas & Evlul, 2011). This kind of teaching would provide a great attachment to the nature and nature and nurture the citizens concerned in damaging nature (Sandell & Ohman, 2010). Regarding teaching in open space there have been conducted many studies, Martin (1999, 2004), Preston (2004), Preston and Griffiths (2004), Payne and Wattchow (2008), Stewart (2008), Wattchow (2008), Wattchow and Brown (2011), Harness and Drossman (2011) are some cases in point. In movie-oriented teaching method, the objective is to promote the students' awareness of environmental issues. Nieszporek and Grodzinska (2011) in their study concluded that blended e-learning can decrease civil e-wastes and cause practical teaching of the environmental protection and sustainable development.

In this regard, during the past several decades grates social demands for environment have prevailed. This has obliged schools and educational institutions to demonstrate that learning is taking place and curriculum development. Hence, a greater emphasis is placed on teaching methods related to environment issues. In movie-oriented teaching method, the objective is to promote the students' awareness of environmental problems or blended e-learning that can help decrease civil e-waste and cause practical teaching of environmental protection and sustainable development.

In Iran, teaching environment is integrated in biology, geology, chemistry, and geography texts which are taught to students in lectures. Hence, teaching environmental content in Iran lacks the ability to influence students' behavior (Haj-Hoseini et al., 2010; Soleiman, 2013; Salehi et al., 2013). Taking into account the role of active teaching method in improving problem-solving skill and students' learning, the purpose of the present research was to study effective teaching method for teaching environment.

2. Method

Research method is mixed method. In qualitative part, a semi-structured interview was administered to collect data from curriculum and environmental experts The statistical population in qualitative part included all curriculum experts at Isfahan Universities (University of Isfahan, Farhangian University, and Islamic Azad University of Isfahan) and environmental experts in Isfahan and Tehran. The chain sampling method was used to select the curriculum and environment experts. For the qualitative research a very large or small sample wasn't advised but achieving the criteria such as data saturation and information repetition shows the adequacy of the sample size (Gall et al, 1996). In these study 12 curriculum experts (7 women and 5 men) and 12 environment experts (5 women and 7 men) were interviewed through a semi-structural interview. In quantitative part, statistical population included all high school teachers who taught biology, chemistry, geography, and geology in the province of Isfahan, in academic year 2014-15, among whom 254 teachers were selected randomly as statistical sample. Table 1 shows the frequency of demographic features of this sample.

Table 1. Frequency of demographic features in teachers' sample

Teachers' Sample		Frequency	Percentage
Gender	Without response	2	0.8
	Woman	178	70.1
	Man	74	29.1
Working record	Without response	6	2.4
	More than 15 years	203	79.9
	Five to 15 years	38	15
	Less than five years	7	2.8
Educational level	Without response	4	1.6
	PhD	7	2.8
	MA	81	31.9
	BA	162	63.8
Major	Without response	6	2.4

Biology	69	27.2
Chemistry	108	42.5
Geography	62	24.4
Geology	9	3.5

In this study two instruments including semi-structured interview and questionnaire were used. This questionnaire is based on interviews with curriculum and environmental experts were prepared .To determine the validity of instruments, content validity has been applied and the reliability of this questionnaire was calculated at 0.90, using Cronbach at alpha coefficient. The qualitative data analysis was conducted through content analysis or subjective content analysis methods.

3. Research Questions in the Qualitative Part

A. What do you think about the current methods of environmental education in high schools of Iran?

B. What are the most important environmental teaching methods which is neglected in rendering a curriculum appropriate for teaching environment in Iran?

4. Findings

4.1 Qualitative Findings

4.1.1 First Study Question

What do you think about the current methods of environmental education in high schools of Iran?

During the interview with 12 curriculum experts and 12 environmental experts, were information enrichment, saturation and data repetition were provided. Curriculum experts was all at PhD level and from the total of 12 environment experts 6 individuals had PhD related to the environment, 5 had engineering degree related to the environment and one had MA in environment teaching. All 24 participants in the interview considered the environmental teaching methods in the high school as "weak and undesirable". For instance, the fifth participant stated that:

> If the environment teaching methods were good in Iran, surely it would affect the people's behavior for environment protection; however, we see that the status of our environment is not good. The air is polluted in most cities of our country, and underground water is contaminated by chemicals which are harmful for our health. Per capita water consumption is high in our country. These facts show that environment teaching methods are not appropriate and suitable and to cope with these environmental challenges, applying active and effective methods is necessary in order to change Iranian citizen's behavior in protecting the environment.

In order to follow these experts' views regarding environmental teaching methods neglected in the high school of Iran, the next question was proposed.

4.1.2 Second Study Question

What are the most important environmental teaching methods which is neglected in rendering a curriculum appropriate for teaching environment in Iran?

The results of analyzing the responses by environmental experts regarding environmental teaching methods neglected in Iran presented in Table 2.

Table 2. The experts' views regarding environmental teaching methods neglected in Iran

Teaching Method	Curriculum Experts		Environmental Experts	
	Frequency	Percentage	Frequency	Percentage
Open space	10	18.2	9	17.3
Project-oriented	9	16.4	7	13.5
Critical	8	14.5	3	5.8
Blended-electronic	3	5.5	6	11.5

Problem solving	8	14.5	6	11.5
Participatory	7	12.7	5	9.6
Brain storm	0	0	2	3.8
Movie-oriented	4	7.3	7	13.5
Power point	0	0	1	2
A blend of all methods depending on the success	6	10.9	9	11.5
Total	55	100	7	100

According to Table 2 it was found out that many experts believe in environmental teaching in the open spaces and then in project-oriented ones. In order to investigate the views of participants in the interview and the reason of choosing their teaching method, some samples are given in the followings. As an example, in defending teaching method in the open space the eighth participant stated that:

> Each method should be administered considering environmental condition. For example if we teach in Isfahan, we take the students to Zayanderood river once and hold the class in dry parts of the river and investigate why there is no water in order for the students to sense environmental problem.

Or in arguing brain storm, the first participant stated that:

> If you remember, while draining oil in Mexico bay, the hair saloons collected hair and threw them there. Oil spots stuck to them. I wish to say that creativity should be in many issues.

The tenth participant stated that: "considering the existing limitations in our country, I select participatory method. We cannot get to the end and solve the environmental problems unless there is participation". Or the twelfth participant stated that: "All active methods should be used in their proper place; for instance, in project-oriented method, we need a teacher who can direct and facilitate the project". The third participant, for example, stated that:

> I agree with all active methods especially teaching in open space which is a very effective method in the environment teaching, but it is not possible in our country. When children study in a non-profit 300-meter school, with 300 students wherein, per capita physical space might be less than one square meter, and there is no place as a national park to take the students and teach them, the issue of teaching environment in the open space is resolved automatically.

4.2 Quantitative Findings

In order to get the teachers' views related to desirable environmental teaching methods in high school of Iran, the results from the interview with experts were provided and they were distributed among biology, geology, chemistry and geography teachers. Results are given below.

4.2.1 Investigation the Importance of the Items

In order to investigate the degree of the scale of environmental teaching methods from the viewpoint of biology, chemistry, geography and geology teachers, the mean of responses to each item was compared through applying one sample t-test. The results of one sample t-test showed that the mean of teachers' views are significantly higher than score 3 for all the items of the scale of environmental teaching methods components; that is, majority of the teachers agree or greatly agree with proposed items.

4.2.2 Comparison of Male and Female Teachers' Ideas

To investigate the difference in men and women's views teaching methods scale, the total means in both groups were compared through t-test. Table 3 shows the results.

Table 3. Investigating the difference in the ideas of women and men regarding the scale of teaching methods

Gender	Number	Mean	Standard Deviation	Standard Error	Independent T Size	Significance
Female	178	4.40	0.510	0.0382	0.528	0.598
Male	74	4.36	0.482	0.0561		

The obtained results in table 3 shows that there is no significant difference between the total means of men and women's ideas regarding the scale of teaching methods and generally these two groups have similar views regarding the items related to the scale of environmental teaching methods components.

4.2.3 Comparison of Teachers' Ideas With Regard to Field of Study

In order to investigate the differences in teachers' views regarding the teaching methods, total means of the ideas of geology, biology, geography and chemistry groups were compared through applying one way ANOVA test Table 4 shows the results.

Table 4. Investigating the difference of the teachers' ideas in various majors about the scale of teaching methods

Major	Frequency	Mean	Standard Deviation	Standard Error	F	Significance
Geology	9	4.31	0.539	0.179	1.874	0.135
Geography	62	4.33	0.596	0.075		
Chemistry	108	4.46	0.451	0.043		
Biology	69	4.30	0.475	0.057		

The results in Table 4 show that there is no significant difference between the total means of teachers in various courses in the scale of teaching methods, and generally these four groups have not given similar ideas regarding the items associated with the environmental teaching methods components.

4.2.4 Confirmatory Factor Analysis of 10-Item Scale of Environmental Teaching Methods Administered on the Teachers

In order to run the confirmatory factor analysis and investigate the validity and reliability of this scale, model the scale items were assumed as observed variables, and the environmental teaching methods as latent variables. Then the analysis was conducted through applying Amos 19 statistical software and the method of maximum likelihood method and goodness of fit indices of the model were extracted.

Table 5. Goodness of fit indices related to confirmatory factor analysis of the scale of environmental teaching methods

	K^2	P	df	K^2/df	GFI	AGFI	NFI	TLI	CFI	RMSEA	RMR
Corrected Model	409.5	0.000	155	2.64	0.85	0.80	0.84	0.87	0.89	0.083	0.041
Status					Acceptable						Suitable

Results of table 5 show that goodness of fit indices for the corrected model at acceptable range is unsuitable. In the next step, the parameters of this measurement model were investigated. Table 6 shows the estimated parameters in this model including factor loading and the value size of t index, to investigate the significance of factor loading for each item on the latent variable of environmental teaching methods besides evaluating its reliability. Further, factor weight scores, the order of the importance of factor loadings and descriptive features of the items are presented in the table. It should be pointed out that in order to investigate the validity of latent variable the composite reliability index (the index of validity evaluation in CFA) (CRI) was used.

Table 6. Estimated parameters in the model measuring environmental teaching components

Factor	Items	Descriptive features		Results of confirmatory factor analysis				Reliability
		Mean	Standard Deviation	Factor Loading	T Value	Factor Weight Score	The Order of Importance	CRI
Components of environmental teaching	Practical use of technology in teaching environmental to decrease e-waste and asking for giving assignments through technology (considering school and students' facilities)	4.61	0.63	0.76*	8.48	0.113	1	0.90
	Defining and implementing projects supervising environmental issues	4.36	0.84	0.73*	7.27	0.086	2	
	Teaching practical skills to cope with environmental challenges	4.39	0.75	0.70*	8.08	0.086	2	
	Participating in open spaces like: green spaces or watching sand hills (based on geographical location) to company with the nature and implied teaching of environmental protection	4.48	0.75	0.64*	7.62	0.076	3	
	Making short films or taking photos about environmental or national challenges and stating practical techniques at the students' ability level (considering the students' facilities)	4.52	0.77	0.72*	8.19	0.072	4	
	Rendering short films by the teacher about local and national environmental challenges	4.26	0.92	0.71*	8.10	0.066	5	
	Students group participation in investigating local environmental challenges	4.16	0.96	0.68*	7.91	0.063	6	
	Nurturing critical thinking related to local environmental challenges concomitant with rendering practical techniques	4.74	0.54	0.59*	11.37	0.040	7	
	Student group participation in investigating environmental challenges and rendering technique considering the person's knowledge	3.99	1.12	0.70*	8.07	0.035	8	
	Nurturing critical thinking associated to environmental teaching	4.53	0.68	0.57*	----	0.032	9	

Method: Maximum likelihood (P<0.01*).

As it is observed in Table 6, all items of factor weight scale have significant effect on the environmental teaching methods, factor that indicates the structural validity of this scale. Further, results of investigating combinatory validity for this factor show that this coefficient is 0.91, which implies perfect validity for this factor (Raykove, 1997).

Investigating factor weights of the items showed that four items of practical use of technology in environment teaching aiming at decreasing e-waste and asking for giving assignments through technology application (considering school and students' facilities), teaching practical skills to cope with environmental challenges, defining and administering supervisor projects on environmental issues and participating in open space like: green spaces atmosphere or watching sand hills (based on geographical location) to company with the nature as well as implied teaching of environmental protection, and implied teaching of environment al protection have greatest weight respectively; in other words, these results show that from the viewpoint of sample group teachers, these four components are the most important components to teach environmental teaching for high school students.

5. Discussion and Conclusion

Considering the poll taking conducted in the study, it was found out that environment teaching method is not desirable. On the other hand, if the content of the books is not taught through active methods and conformed to structuralism approach, it will not have much effect on the students' knowledge, attitude and skill. In the present study after taking poll from biology, geology, chemistry and geography teachers (four groups of teachers which the content of teaching environment in their books are covered in blended form), it was shown that teaching method of practical use of technology in teaching environment aiming at decreasing e-waste and asking assignments through applying technology, was located on the top of teaching methods by four groups of teachers. The reason for choosing this teaching method as the first priority, is the tendency and encouraging educational system of Iran to active technological teachings that leads to creating a large amounts of e-waste too; the second chosen teaching method is the method of practical skills teaching to cope with environmental challenges and also defining and implementing projects supervising on environmental issues. Choosing these teaching methods as the second priority indicates the tendency of these four groups of teachers to motivate the students and make them concerned about the status quo (project-oriented teaching method) and create skill in Iranian students to cope with current environmental crises of local and national community. Moreover choosing teaching method of participating in open space as their third priority shows the teachers' emphasis on company with the nature and creating environmental conduct. Generally, Iranian teachers chose teaching methods to teach environmental not only to promote their knowledge but also affect the attitude and skills of environment al protection and creating environmental conduct. According to taking poll, teaching methods of nurturing critical thinking related to local environmental challenges concomitant with rendering practical techniques, students' group participation in investigating environmental challenges and rendering techniques considering the person's knowledge, nurturing critical thinking related to local environmental challenges had lowest factor loading. This choice shows the lack of Iranian teachers' tendency toward critical thinking teaching and also their lack of tendency to encourage the students to participatory work and rendering technique. This choice is rooted in lack of correct implementation of critical thinking in books content teaching and also the students' opposition in implementing participatory method in Iran which could negatively affect teachers' attitude.

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