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A Comparative Study of Sustainability Education among Iranian EFL Instructors and Social Sciences Instructors

Naser Rashidi [1*], **Zahra Tavakkoli** [2]

[1] *Professor, Department of Foreign Languages and Linguistics, Faculty of Literature and Humanities, Shiraz University, Shiraz, Iran*
[2] *PhD in TEFL, Department of Foreign Languages and Linguistics, Faculty of Literature and Humanities, Shiraz University, Shiraz, Iran*

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Abstract: During the twentieth century, the views of sustainability and its vital contribution to the refinement of education systems have become so momentous that many researchers have sought to remove barriers to achieving sustainability in the education system and across disciplines. Yet, such research has been less common in the humanities. Hence, the present study tried to depict a picture of the strengths and shortcomings of EFL and Social Sciences (SS) instructors in terms of sustainability literacy, sustainability implementation, and eventually Sustainability Education (SE). Moreover, it provides the readers with the status of SE in EFL and SS faculties in Iran and offers clear recommendations for how and in which specific areas to adopt interdisciplinary approaches for SE development. This comparative study can pave the way for further practical studies in these areas through a quantitative method using a researcher-developed questionnaire with 300 participants. It proved that SS instructors have the potential to make outstanding contributions to sustainability literacy enhancement and EFL instructors are well aware of the strategies which work for sustainability implementation. It also came down in favor of the specific courses which should be incorporated into all-round teacher education policy. The study can be an important step towards teacher education reform and has implications for different fields of humanities. It has been implied that multidisciplinary approaches can bring about livelier and more effective teacher training programs.

Keywords: Sustainability, Sustainability Literacy, Sustainability Implementation, Sustainability Education.

[*] **Corresponding Author.**

Authors' Email Address:
[1] **Nasser Rashidi** (naser.rashidi@shirazu.ac.ir), [2] **Zahra Tavakkoli** (shiva.tavakkoli@gmail.com)

Introduction

Sustainability Education (SE), Education for Sustainability (ES), or Education for Sustainable Development (ESD) appeared as a means toward the goals of sustainability science which is a new field dealing with the challenges of sustainability (Redman, 2013). Maitre, O'Farrell, and Reyers (2007) stated that sustainability science aims at conjoining different spheres of science and building the lacking bonds for constructive negotiation between science and the society.

Implementation of Sustainability Education as a widespread, global issue, in all subject areas of education including TEFL and Social Sciences (SS) is considered to be a must (Uitto & Saloranta, 2017). In the present century, there is a growing concern over the issue of active participation and agency for the development of sustainability. Orr (1994) explicitly urged the need to solve the problem of sustainability through education. He believed that all subject areas can play a significant role in preparing learners for lives and livelihoods suited to their context. The framework for the implementation of SE emphasizes that SE should be embedded in all curricula, at all levels, and in different subjects (United Nations Education, Scientific, and Cultural Organization (UNESCO), 2005). This framework states that SE should use multi-method approaches, should be locally and culturally relevant, and should be expressed in different languages (Stewart, 2010).

As a matter of fact, the conceptual and operational content of SE will not show signs of stabilization unless it touches different areas in a cross-disciplinary manner (Vezzoli, 2003). As SE has to do with a number of central notions, comparative studies of the fields which can help convert the learners' outlooks and behavior will provide the opportunity to win over the restrictions of the present approaches to SE actualization (Vargas, 2000). Although numerous studies have pointed to the prominence of SE, there is no definitive evidence of whether SE is applied in the language faculties in Iran or not (Gholami, Sarkhosh, & Abdi, 2016). Social sciences, however, were believed to be a lot more influential in SE development in comparison with other fields according to the literature (Ontong & Le Grange, 2018; Borg, Gericke, Höglund, & Bergman, 2012). Correspondingly, some researchers have imposed requirements on the reconciliation and collaboration between sustainability studies and social sciences (Jung, Park, & Ahn, 2019; Tejedor, Segalas, & Rosas-Casals, 2018; Holm, Sammalisto, Grindsted, & Vuorisalo, 2015; Loncar, 2011; Ortmann, 2010; Libra, 2007). Although sustainability

development is believed to be much more common in social sciences, the state of SE in social sciences faculties has never been depicted (Rau & Fahy, 2013).

According to previously mentioned studies, making comparisons between EFL SE and SS SE will not only build up a vivid picture of the lacks and needs in these two fields but it will also open the way for discovering the necessary remedies in support of sustainability development and consequently the advancement of these two fields. Comparative studies of this type can pave the way toward the required commitment from the education system to reflect the interrelations between the various aspects of sustainable development.

The concept of sustainability and the incorporation of sustainability into education which is discussed under the label of Sustainability Education have been subjected to numerous modifications since their introduction for SE has to be adjusted to the global and local circumstantial requirements (Belkhir, 2015). Though SE is highly accepted and incorporated by various organizations and institutions (Klarin, 2018), the fundamental notions, as well as the implementation barriers, have remained unaltered due to the fact that it is still dark and unexplored in many areas of humanities in spite of the fact that these areas can be significantly influential. Since sustainability is the outcome of the consolidation of different areas, SE actualization will not be possible unless a multidisciplinary, holistic movement is led in higher education (Jung et al., 2019; Libra, 2007). Putting the problem in the context, it is inferred that the higher education system needs to be equipped with a set of new approaches to be made to teacher education programs for the purpose of SE development (Andic & Vorkapic, 2017). Accordingly, the current study is an attempt to find out the areas which should be incorporated into teacher education programs specifically in the field of humanities. As the fields of EFL and SS are considered highly influential in SE development according to previous studies (Tejedor et al., 2018; Wen & Wu, 2017; Zeeshan, 2017), these two areas were picked to be studied in comparison to contribute to the development of sustainability in the humanities.

As a flourishing and beneficial education system is in need of SE implementation (Figueiró & Raufflet, 2015; Fry & Wei, 2015; Rusinko, 2007) and as SE components in higher education are to a great extent unspecified, the present study has made an attempt to compare the strengths and deficiencies of EFL and Social Sciences instructors to pave the way toward SE implementation in higher education through interdisciplinary approaches. As stated in previous studies such as the one done by Uitto and Saloranta (2017), examining in-service subject teachers' knowledge and competencies regarding sustainability development can be highly advantageous and significant.

Ensuring that university students, as future leaders, will lend themselves to sustainability drives depends on the instructors' knowledge and level of implementation of sustainability (Brundiers & Wiek, 2017). Moreover, having a clear picture of the instructors' weaknesses and strengths will not only accelerate the process of SE actualization but also will bring about more vital and dynamic classes specifically through interdisciplinary approaches (Soria et al., 2013). Accordingly, the significance of the present study can be grasped from two main aspects. First, determining the status of sustainability education among professors of two important humanities faculties that form a wide range in universities is of crucial importance for a constitutional reform to be achieved in teacher education, and second, paving the way through interdisciplinary relationships can be really advantageous as interdisciplinary approaches allow for the synthesis of ideas and respect for individual differences simultaneously. In addition, this research can be a wake-up call for the education system at home and abroad, and not only can it open new doors for the expansion of sustainability education, but also it can improve the education system.

Given the significance of sustainability development in education and given that sustainability development needs specific literature and strategies that many university professors, especially in the humanities, are unfamiliar with, the present study was an attempt to compare the status of SE among EFL and SS professors. Based on this, the variables of sustainability literacy and implementation were measured and compared in order to provide interdisciplinary solutions for the development of sustainability and the refinement of teacher education programs. Although the present study was limited in terms of the number of participants, the goal which was perused in the field of humanities and at the university level had not been addressed before. From this perspective, this research can be recognized as a pioneer in the field of sustainability development in the humanities and opens new horizons for future research in this field. To achieve the above objectives, first, a question can be posed as research question number 1.

1. Are EFL instructors different from or similar to SS instructors regarding sustainability literacy?

The second question to be answered in this study might be question number 2.

2. What are the strengths and weaknesses of EFL and SS instructors regarding sustainability literacy dimensions?

The third research question is as follows.

3. Are EFL instructors different from or similar to SS instructors in terms of sustainability implementation?

The next research question which might be posed is question number 4.

4. What are the strengths and weaknesses of EFL and SS instructors regarding sustainability implementation dimension.

Literature Review

Sustainability Education

Sustainability Education is an educative movement to reconcile education and real-life experiences. For SE to be achieved, instructors need to be equipped with special literacy in sustainability as well as the strategies necessary to implement sustainability (Uitto & Saloranta, 2017). Some researchers believe that sustainability literacy and implementation work as a non-linear process (Dominici & Peruccio, 2016; Kabadayi, 2016; Salite, 2015), while some others support the existence of a linear relationship between sustainability literacy and implementation (Cincera, 2013; Karagiorgi & Symeou, 2008). The first group considers sustainability literacy as the theoretical knowledge which feeds into reflective practice and can accelerate the process of sustainability implementation and SE actualization. In this view, sustainability implementation will be achieved even in the paucity of sustainability literacy. The second group, however, considers literacy as a prerequisite for implementation without which implementation is not possible. As a matter of fact, the second group asserts that making a contribution to SE actualization depends on having enough literacy in the first step (Reunamo & Suomela, 2013).

Sustainability Education in the Context of EFL

Although the mutual bond between SE and foreign languages has been proclaimed in some studies (Wen & Wu, 2017; Zeeshan, 2017, Fry & Wei, 2015), some researchers believed that EFL and SE seem to be unrelated (Jiang, 2017; Mohammadi & Moradi, 2017; Israel, 2012).

Mohammadi and Moradi (2017) focused on the relationship between professional development and sustainability and stated that Iranian ELT teachers suffer from the deprivations of sub-standard pre-service education, teacher preparation, and professional development support. As stated by Jiang (2017), professionalism is the key to sustainability and needs globally competent EFL teachers who are far from satisfactory regarding global leadership and literacy. In this regard, Israel (2012) also asserted that sustainability

development is equal to facing global realities, and facing global realities means educating global citizens at schools and universities. He emphasized that when teachers are not globally literate, even the institutional emphasis on sustainability will not be of any use. As a matter of fact, TEFL and sustainability have been considered disparate and incongruent when it came to teachers' literacy and preparation.

The other side of the coin, however, shows the studies which believe in EFL SE as a contributing version of SE development due to the two-way relation between the two spheres of sustainability and TEFL. According to Ishimori (2010), for instance, SE can be actualized through foreign language teaching, and communicative competence can be reached through SE. The effectiveness of EFL SE lies in its multi-dimensional platform. According to Zeeshan (2017), EFL SE is a means to fulfill both sustainability goals and linguistic ones. It is noteworthy that even studies that linked these two areas mentioned many obstacles to achieving the goal of sustainability development.

Zeeshan (2017) emphasized the importance of ESD promotion through English language teaching. His ideas were in line with those of UNESCO (2005) regarding the vital role of universities in the expansion of sustainability modus operandi. The good fortune of the society is resultant of sustainability literacy and implementation which will not come true in the absence of well-informed, educated English teachers (Zeeshan, 2017). The researcher further maintained that SE and ELT seem alien at the first glance since English language teachers feel that they are supposed to teach merely language (i.e. vocabulary, grammar, and communication skills). This can be the reason why the central role of English language teachers has been neglected so far although some researchers have depicted a clear picture of the close connection between SE and EFL (Jacobs & Cates, 1999).

Wen and Wu (2017) conducted a study on Singapore Chinese language teachers' professional proficiency and training needs for sustainable development. This study emphasized the straightforward bond between constant professional development and becoming responsible mentors for sustainable education. The study focused on Chinese language teachers' subject features and training needs and provided insight into the nature of in-service training programs and workplace learning support. The study conducted by Wen and Wu (2017) which is very strong in terms of the number of participants is among the very few studies done in the area of sustainability in language teaching and teacher training and provides very useful information about the issues in these areas. Wen and Wu (2017) used an explanatory mixed methods approach to capture the teachers' professional proficiency and

training needs through a large-scale survey. Then and there, focus group discussions and interviews were run by the researchers to have a clear picture of teachers' outlooks on their strengths and difficulties of Chinese teaching in Singapore and also in-service training needs. The results of Wen and Wu's study (2017) revealed that: 1) teachers needed more training, 2) teachers said they needed continued and persistent training on curricular knowledge and pedagogic design, 3) beginning teachers needed more support from experienced teachers, and 4) teachers needed assistance to understand the theory behind the practice.

Sustainability Education in the Context of Social Sciences

In 2011, Loncar stated that while environmental issues, as synonymous terms with sustainability issues, were traditionally more common in science faculties, they started to be the point of focus in the faculties of social sciences. This shows that sustainability issues were mainly environmental and some steps forward had to be made to incorporate sustainability into social sciences.

In 2018, Tejedor et al. referred to three main prevalent discourses in social sciences which must be incorporated into other fields for the purpose of sustainability operationalization. The necessary discourses mentioned in their study were: 1) the discourse of transcendence, 2) the discourse of problem-solving, and 3) the discourse of transgression. These three main discourses were considered as the sub-divisions of the discourses on soft, hard, inclusive, and reflexive transdisciplinarity (Tejedor et al., 2018). It is worth mentioning that the real-world argument, innovation argument, and transcendent interdisciplinary research argument were mentioned as the arguments used for addressing societal problems. The advantage of the study conducted by Tejedor et al. (2018) lies in the introduction and classification of the significant and useful discourses used for sustainability actualization. As the labels of the discourses show, emphasis should be placed on holism, overstepping, practicalization, and metamorphosis in all fields. The significant role of social sciences in defeating sustainability challenges was previously affirmed by Feinstein and Kirchgasler (2015). They stated that sustainability challenges could be overcome in case educators in science and social studies collaborate systematically to ''provide realistic and powerful preparation for future sustainability challenges'' (Feinstein & Kirchgasler, 2015, p. 121).

Zhao, Mok, and Cao (2019) referred to teachers, specifically those in social sciences, as the sustainability agents on the front line and predicted that SS instructors would be willing enough to successfully implement sustainability. The authors considered curriculum reform as

the main obstacle to sustainability implementation. They believed that SS instructors must go through the process of curriculum modification and localization if they want to successfully implement sustainability.

Method

Participants

The participants who played a part in the survey phase of the study were 150 EFL instructors and 150 social sciences instructors teaching at different universities in five different cities of Shiraz, Tehran, Esfahan, Yazd, and Bushehr selected via convenience and snowball sampling. The instructors were from the same education level based on their academic degrees, but different ages, genders, and educational and experiential backgrounds. The descriptive statistics for the EFL instructors and Social Sciences instructors regarding their age, gender, and years of teaching experience are indicated in tables 1 and 2. EFL and Social Sciences were compared as there are differences between them including the language of instruction and curriculum.

Table 1. *The Descriptive Statistics for EFL Instructors Based on Their Age, Gender, and Years of Experience*

Department	TEFL	Frequency	Percentage
Age	27-47	66	44%
	48-67	73	48.66%
	68-…..	11	7.33%
Gender	Male	86	57.33%
	Female	64	42.66%
Years of Experience	1-10	55	36.66%
	11-20	68	45.33%
	21-30	27	18%
Total		150	100%

Table 2. *The Descriptive Statistics for Social Sciences Instructors Based on Their Age, Gender, and Years of Experience*

Department	Social Sciences	Frequency	Percentage
Age	27-47	72	48%
	48-67	71	47.33%
	68-…..	7	4.66%
Gender	Male	78	52%
	Female	72	48%
Years of Experience	1-10	61	40.66%
	11-20	49	32.66%
	21-30	40	26.66%
Total		150	100%

Instruments

Since the area of the present research is relatively new, a ready-made instrument was not feasible. As a result, the researcher constructed a questionnaire following the steps to questionnaire development adopted from the guidelines proposed by Brown (2001) and Dornyei (2010) shown in Figure 1. Developing a questionnaire in this research is a unique feature that not only distinguishes the research but also adds to the breadth and depth of the study in comparison with previous studies. Additionally, a series of speculative and professional measures were taken to take into account the reliability and validity of the instrument and also the accuracy of the data. As the questionnaire consisted of two parts, sustainability literacy and sustainability implementation, Cronbach's Alpha (CA) for each part was estimated separately. The estimated CA for the sustainability literacy section was equal to 0.943 and for the sustainability implementation section was equal to 0.947. To assess the validity of the questionnaire, Confirmatory Factor Analysis (CFA) was conducted and the estimated p-value for all the items was below .005. The results of CFA for sustainability literacy and implementation are shown in tables 3 and 4. The final version of the questionnaire consisted of 27 questions dealing with sustainability education and 38 questions considering sustainability literacy.

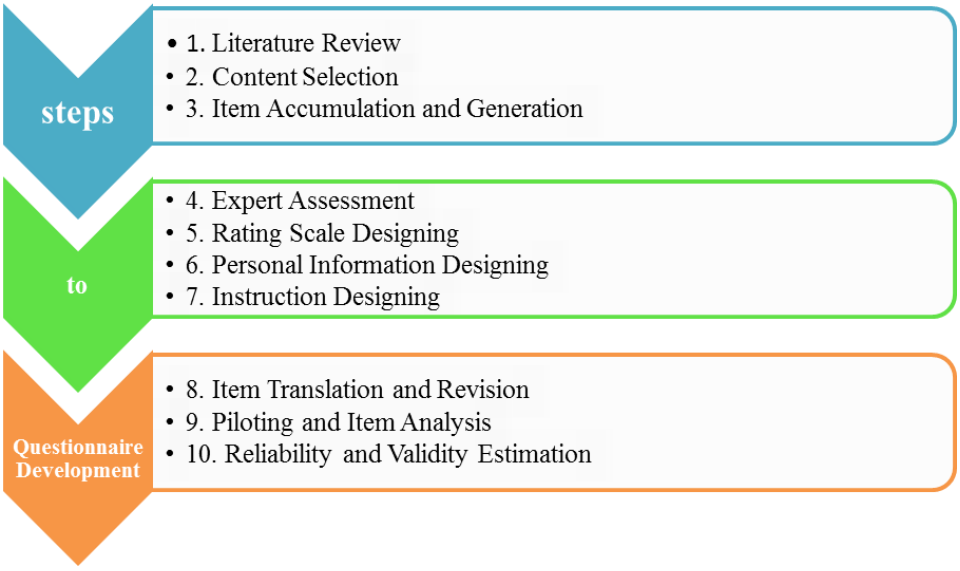

Figure 1. *Questionnaire Development Guideline (adopted from Brown, 2001, p. 78; Dornyei, 2010, p.114)*

Table 3. *Factor Structure of Sustainability Literacy Variables*

Item number	Item type	Estimate	C.R.	P
q1	environmental	1.000		
q2	environmental	1.329	3.614	***
q3	environmental	1.355	3.240	.001
q4	environmental	1.130	3.655	***
q9	economic	1.000		
q10	economic	1.402	2.606	.009
q11	economic	1.268	2.392	.017
q12	economic	1.434	2.519	.012
q24	cultural	1.000		
q25	cultural	1.491	1.982	.042
q26	cultural	2.082	1.961	.045
q27	cultural	2.007	2.608	.008
q16	sociopolitical	1.000		
q17	sociopolitical	.940	3.867	***
q18	sociopolitical	.767	3.636	***
q19	sociopolitical	.496	2.030	.042
q5	environmental	.965	2.802	.005
s6	environmental	1.250	3.859	***
q7	environmental	1.337	3.595	***
q8	environmental	1.040	2.595	.009
q13	economic	1.562	2.697	.007
q14	economic	1.240	2.360	.018
q15	economic	1.344	2.509	.012
q20	sociopolitical	.715	2.726	.006
q21	sociopolitical	.927	4.227	***
q22	sociopolitical	.783	3.777	***
q23	sociopolitical	.777	3.492	***

Table 4. *Factor Structure of Sustainability Implementation Variables*

Item number	Item type	Estimate	C.R.	P
q30	curricular	1.000		
q29	curricular	.798	6.289	***
q28	curricular	1.017	7.045	***
q49	professional	1.000		
q48	professional	.909	4.911	***
q47	professional	.790	4.241	***
q46	professional	.990	4.969	***
q45	professional	1.085	4.892	***
q44	professional	1.021	4.904	***
q43	professional	1.091	5.328	***
q42	professional	.924	4.667	***
q41	professional	.846	4.569	***
q40	professional	1.270	5.569	***
q39	professional	1.202	5.474	***
q38	professional	.723	4.081	***
q37	professional	.709	4.059	***
q36	professional	.868	4.641	***
q35	professional	.592	3.546	***
q34	professional	1.106	5.202	***
q33	professional	.817	4.484	***
q32	professional	.986	4.778	***
q31	professional	1.002	4.730	***
q58	ethical	1.000		
q57	ethical	1.145	6.074	***
q56	ethical	1.364	6.596	***
q55	ethical	1.109	6.036	***
q54	ethical	1.360	6.542	***
q53	ethical	.859	5.056	***
q52	ethical	.824	4.904	***
q51	ethical	.936	5.499	***
q50	ethical	1.080	5.866	***
q59	affective	1.000		
q60	affective	.692	5.355	***
q61	affective	1.284	10.132	***
q62	affective	1.302	10.097	***
q63	affective	.566	4.418	***
q64	affective	1.056	8.172	***
q65	affective	1.008	7.146	***

Procedure

The related data were gathered using the developed questionnaire. After the development and validation of the SE questionnaire, the researchers contacted some of the participants either in person or via telephone to describe the process. The questionnaire was administered either through E-mail or as a hard copy to the target participants. As some professors were not totally

familiar with the term Sustainability Education or mistakenly considered it synonymous with sustainable development, the whole idea of SE was clarified. Before the distribution of the questionnaire, the researchers contacted the available instructors at each university and got permission for the process. The instructors were also asked to distribute the questionnaire to however many instructors possible.

For the purpose of data analysis, different tests and analysis procedures were used. First of all, descriptive statistics and means comparison graphs were used to discover the overall status of sustainability literacy, sustainability implementation, and the sub-divisions. Then, to compare the EFL instructors' gathered data with those of social sciences instructors, Levene's Test for Equality of Variances was used to pave the way toward running independent samples t-test. To run the tests, the latest version (V27) of the Statistical Package for the social sciences (SPSS) was used.

Results and Discussion

Results

Descriptive Analysis in Comparison

The descriptive analysis presented in this section provides worthwhile information regarding sustainability literacy and its sub-divisions (i.e. environmental, economic, socio-political, and cultural dimensions), and similarly, sustainability implementation and its sub-divisions (i.e. curricular, professional, ethical, and affective aspects). As the bar graphs ease the way for comparing the mean scores, means comparisons are depicted through bar graphs. A complete list of sustainability literacy components and indicators that are extracted from literature is given in Table 5.

Table 5. *Sustainability Literacy Components and Indicators*

	Environmental Issues	Economic Issues	Socio-political Issues	Cultural Issues
1	Environmental rehabilitation	Economy functions	Women's rights	Community values
2	Coastal preservation	Economy development	Children's rights	Absence of discrimination
3	Waste management	Free trade	Global equality	Cultural rights
4	Renewable natural resources	Free market	Ethnic equality	Citizenship
5	Biofuels	Global market	Unemployment	Cultural diversity
6	Acid rain	Multinational corporations	Eradication of poverty	_____
7	Greenhouse gas reduction	Infrastructure development	Bribery	_____
8	Endangered species	Economic aid	Corruption	_____
9	Climate change	Financial stability	Infectious diseases	_____
10	General pollution reduction	Job creation	Right access to health care	_____
11	Green cars	Investment	Literacy	_____
12	Biodiversity	Industry	Access to good education	_____
13	Global warming	Agriculture	Refugee crisis	_____
14	Emissions	Bottom-up development	Human trafficking	_____
15	Desertification	Prosperity	Food security	_____
16	Deforestation		Educational cooperation	_____
17	Land use		Protection of minority rights	_____
18	Ozone depletion		Social cohesion	_____
19	Mining regulations			_____
20	Water conservation and management			_____

As it can be easily noticed in Figure 2, SS instructors have been ahead in terms of environmental, economic, and socio-political literacy, and cultural literacy seems to be the only type of literacy in which EFL instructors showed better but not with a large gap.

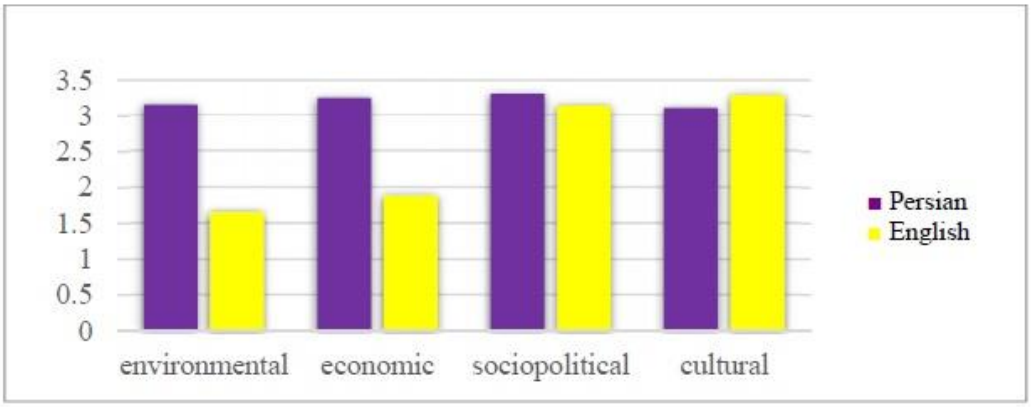

Figure 2. *Means Comparison of Sustainability Literacy Dimensions*

Figure 3 shows the other side of the coin which deals with the four dimensions of sustainability implementation. As shown in the bar graph, there has been fierce competition between the two groups.

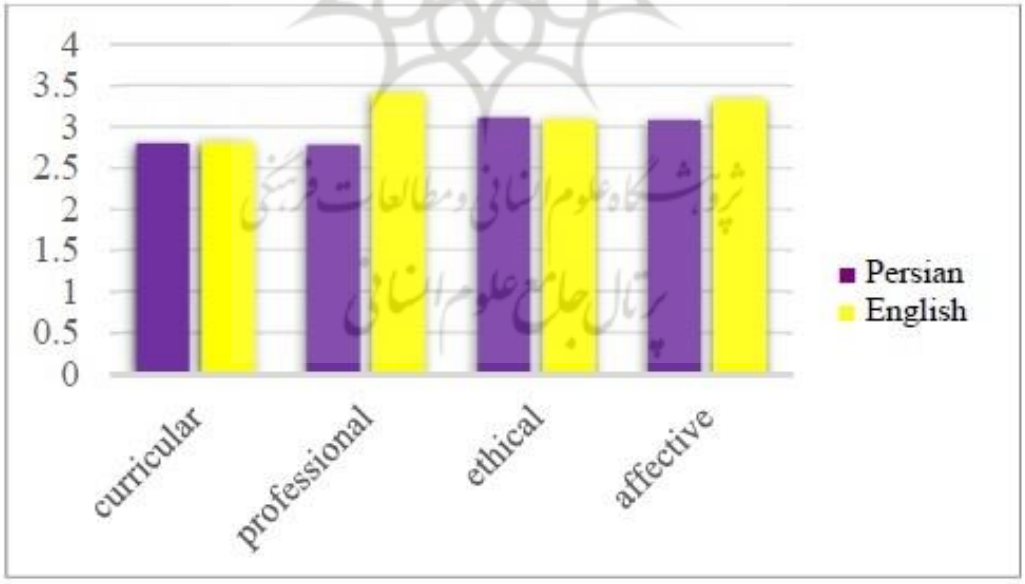

Figure 3. *Means Comparison of Sustainability Literacy Dimensions*

According to Figure 4, in terms of sustainability literacy, SS instructors are in a better condition, and in terms of sustainability implementation, EFL instructors seem to implement sustainability paradigms more frequently than SS instructors.

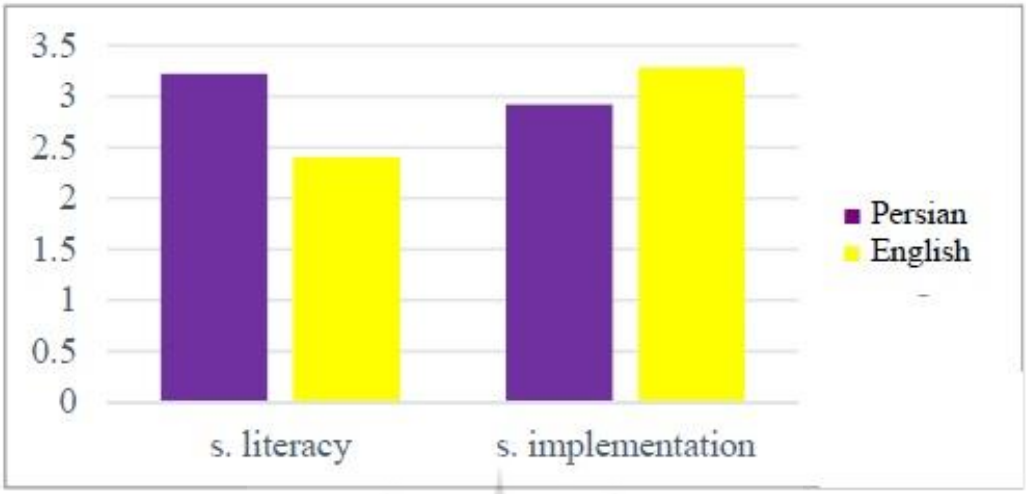

Figure 4. *Means Comparison of Sustainability Literacy versus Sustainability Implementation*

Figure 5 shows that neither EFL instructors, nor SS instructors are of medium ability in Sustainability Education. Yet, SS instructors seem to be a little better off.

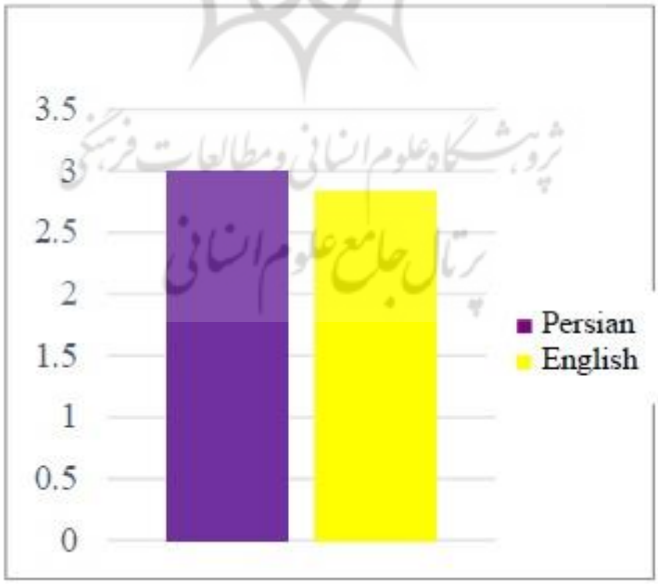

Figure 5. *Means Comparison of Sustainability Education*

Independent Samples t-Test Results in Comparison

Checking the equality of variances was the requisite pre-supposition needed for running the independent samples t-test. As a result, Levene's test was used prior to running the t-test and the results are shown in Table 6. As the significance level shows, the hypothesis of the equality of variances is rejected for all the dimensions except for cultural and sociopolitical dimensions. That is to say, the t-test for these two dimensions has been used with the hypothesis of the equality of variances.

Table 6. *Leven's Test for Variance Equality*

	F	Sig.	Results
Environmental	89.292	0	H0/reject
Economic	402.232	0	H0/reject
Sociopolitical	1.241	0.266	H0/accept
Cultural	0.577	0.448	H0/accept
Curricular	5.236	0.023	H0/reject
Professional	323.865	0	H0/reject
Ethical	27.847	0	H0/reject
Affective	6.107	0.014	H0/reject
Sustainability implementation	133.086	0	H0/reject
Sustainability literacy	173.725	0	H0/reject
Sustainability Education	39.896	0	H0/reject

As shown in Table 7, the hypothesis of the equality of the mean scores of the EFL instructors' group and SS instructors' group has been rejected for all, except for sociopolitical and cultural, dimensions of sustainability literacy. A close look at the mean differences reveals that the only dimension in which EFL instructors have outperformed was the cultural dimension since the mean difference is equal to -0.18. This confirms that SS instructors are in a better position in terms of sustainability literacy and emphasizes the urge for increasing the EFL instructors' consciousness of sustainability literacy dimensions and technical terms for further development.

Table 7. *Independent Samples t-test for Sustainability Literacy*

		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
environmental	Equal variances not assumed	21.690	218.854	.000	1.49860	.06909	1.36243	1.63477
economic	Equal variances not assumed	13.489	184.106	.000	1.36300	.10104	1.16365	1.56235
sociopolitical	Equal variances assumed	4.431	298	.000	.16467	.03716	.09153	.23781
cultural	Equal variances assumed	-3.830	298	.000	-.18000	.04700	-.27249	-.08751

As shown in Table 8, the hypothesis of the equality of the mean scores of the EFL instructors' group and SS instructors' group has been rejected for the professional and affective dimensions of sustainability implementation and accepted for the curricular and ethical dimensions. This proves that the performance of the participants in terms of curricular and ethical dimensions has not been significantly different. A close look at the mean differences reveals that EFL instructors have outperformed in terms of professional and affective sustainability implementation since the mean differences are equal to -0.63 and -0.25, respectively.

Table 8. *Independent Samples t-test for Sustainability Implementation*

		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
curricular	Equal variances not assumed	-0.28	286.661	0.78	-0.01327	0.04739	-0.10655	0.08002
professional	Equal variances not assumed	-14.506	175.734	0	-0.6344	0.04373	-0.72071	-0.54809
ethical	Equal variances not assumed	0.421	237.159	0.674	0.01753	0.04161	-0.06443	0.0995
affective	Equal variances not assumed	-7.692	277.617	0	-0.2574	0.03346	-0.32327	-0.19153

As shown in Table 9, the hypothesis of the equality of the mean scores of the EFL instructors' group and SS instructors' group has been rejected for sustainability literacy and implementation (sig<0.05). This proves that the performance of the participants in terms of sustainability literacy and implementation has been significantly different. A close look at the mean differences reveals that EFL instructors have outperformed in terms of sustainability implementation since the mean difference is equal to -0.36 and SS instructors have outperformed in terms of sustainability literacy since the mean difference is equal to 0.81.

Table 9. *Independent Samples t-test in General*

		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
SE Literacy	Equal variances not assumed	16.785	220.213	0	.81860	.04877	.72249	.91471
SE Implementation	Equal variances not assumed	-13.381	188.354	0	-0.3614	0.02701	-0.41468	-0.30812

As shown in Table 10, the hypothesis of the equality of the mean scores of the EFL instructors' group and SS instructors' group has been rejected for Sustainability Education (sig<0.05). This proves that the performance of the participants in terms of SE has been significantly different. Overall, a close look at the mean differences reveals that SS instructors have outperformed in terms of Sustainability Education since the mean difference is equal to 0.14.

Table 10. *Independent Samples t-test for SE*

		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
SE	Equal variances not assumed	11.966	181.808	.000	.14700	.01229	.12276	.17124

Discussion

At the first level, the results of the present study give the readers a fresh outlook on the status of Sustainability Education among EFL and SS instructors independently. The following conclusions can be made by examining the results obtained for EFL and SS instructors separately:

EFL instructors are not considered literate in terms of sustainability.

The sustainability literacy of EFL instructors is below average and is not acceptable. Looking at the scores of the professors in various dimensions of sustainability literacy, it can be inferred that their environmental and economic knowledge is really sub-standard, which is fundamentally due to the lack of professional familiarity of professors with these areas. The cultural dimension is the most recognizable strong point of the instructors and the environmental dimension is the most detectable weakness. This finding can show the reason behind the idea of the non-existence of a relationship between TEFL and SE as stated in some previous studies (Jiang, 2017; Mohammadi & Moradi, 2017; Israel, 2012). In fact, the lack of sufficient literacy in the field of sustainability and the unfamiliarity of the EFL instructors with the main areas of sustainability confirm that these two disciplines seem unrelated.

SS instructors are considered literate in terms of sustainability.

The sustainability literacy of social sciences professors is above average and acceptable. Looking at the scores of professors in various dimensions of sustainability literacy, it can be inferred that their knowledge is extensive and in-depth in all aspects of sustainability literacy specifically socio-political aspects, which is mainly due to the specialized familiarity of professors with these topics. The socio-political dimension is the most obvious strong point of social sciences professors. The satisfactory knowledge of SS instructors in different areas of sustainability affirms the direct relationship between sustainability issues and social sciences spheres as stated in previous studies (Tejedor et al., 2018; Feinstein & Kirchgasler, 2015; Loncar, 2011). This affirms the prevalence of the discourses needed for sustainability development in social sciences. As stated by Tejedor et al. (2018), it contributes to SS instructors' sustainability literacy.

EFL instructors are considered willing to implement sustainability.

The sustainability implementation of EFL instructors is above average and satisfactory. Looking at the scores of the professors in different areas of sustainability implementation, it can be seen that they observe all aspects of sustainability implementation in their teaching except the dimension related to curriculum because they are highly committed to the standards and ethics of their work, and care about professional idiosyncrasies, knowledge, and skills, affective education, and social skills indoctrination. EFL instructors can be seen from a position of strength in terms of professionalism and professional identity. The registered high professional development level is in contrast with the findings of some studies such as

Mohammadi and Moradi (2017) and Israel (2012) in which EFL instructors lacked the high standards of professionalism and global competence needed for sustainability implementation.

SS instructors are considered unwilling to implement sustainability.

In contrast to Zhao et al. (2019), the sustainability implementation of social sciences professors is below average and is not satisfactory. Looking at the scores of the professors in different dimensions of sustainability implementation, it can be understood that they are not in search of curricular and professional development, and this makes them unsuccessful in the area of sustainability implementation. Lack of professionalism and professional development seems to be the main obstacle to the SS instructors' incorporation of sustainability which is different from Zhao et al.'s study in which curriculum reform was believed to be the main impediment to sustainability implementation. Besides all their disadvantages in this area, they proved to possess and follow moral principles and display ethical values. However, Zhao et al. (2019) discovered that SS instructors are not only enthusiastic enough to implement sustainability but also capable enough.

Since the purpose of this study was to compare EFL and SS instructors in the area of Sustainability Education, it has provided valuable results through which Sustainability Education can be incorporated into EFL and social sciences classes. The following paragraphs discuss some of the important results obtained.

In response to the first and second research questions; SS instructors are in a better position in terms of sustainability literacy specifically in the environmental, economic, and socio-political areas: There is a direct relationship between areas of expertise and sustainability literacy.

Due to the specialized courses they have taken during their university years and due to the nature of their field, SS instructors are more literate in sustainability, and they can transfer the necessary specialized literacy and knowledge to EFL instructors through interdisciplinary communication. This affirms Vezzoli's (2003) emphasis on cross-disciplinary approaches.

As emphasized by Burns (2011), the dimensions of sustainability pedagogy have their roots in learning theory which has its roots in literacy at the first level. In higher education, campus sustainability culture creation is not possible in the absence of sustainability literacy (Selby, 2009). Stewart (2010) believed that for teachers to be dedicated to the applied actualization of sustainability, they need to be initially literate in sustainability and this literacy is mainly connected with teachers' professional knowledge. This can reveal why SS instructors

are superior in terms of sustainability literacy in comparison with EFL instructors. In fact, Beveridge, McKenzie, Aikens, and Strobbe (2017), stated that the first step towards sustainability operationalization in the education system is to have literate and highly knowledgeable professors and that's why some fields are more successful than others. In 2011, Loncar declared that unlike before, sustainability started to be incorporated into social sciences. The main prevalent discourses in social sciences which did not exist in the rest of the disciplines were considered a gate to sustainability operationalization. The existence of these discourses was the distinguishing feature of the social sciences from other disciplines (Tejedor et al., 2018). It seems that due to SS instructors' familiarity with sustainability discourses, they have a higher level of sustainability literacy (Feinstein & Kirchgasler, 2015). The first finding of the present study is in line with the theoretical views of previous studies and proves that there is a direct relationship between the specialty of social sciences professors and their sustainability literacy, which makes them score better in this field compared to EFL professors. This finding also affirms the urge to reconcile sustainability studies and social sciences (Holm et al., 2015).

In response to the third and fourth research questions; EFL teachers have shown to be more willing in implementing sustainability: The relationship between sustainability literacy and sustainability implementation is non-linear rather than linear.

As stated by Zeeshan (2017), due to the nature of second language teaching which is an ongoing learning process in which teachers involve in in-service training and workshops and try to model real situations, and because EFL instructors deal with learners' feelings and reactions such as anxiety, motivation, attitudes, self-esteem, self-efficacy, and inhibition, they were better able to implement sustainability. The interesting point is that EFL instructors proved to be more willing and competent in sustainability implementation while their literacy in sustainability has not been enough. This is in line with the findings of those studies such as Kabadayi (2016) and Salite (2015), in which sustainability implementation was believed to be achieved even in the paucity of sustainability literacy. These researchers believed that sustainability literacy and implementation work as a non-linear process, otherwise sustainability implementation will not come true when sustainability literacy is not sufficient.

As EFL teachers scored higher in sustainability implementation and lower in sustainability literacy and the result was the other way around for SS instructors, sustainability literacy can be considered necessary but not a pre-requisite for sustainability implementation. This affirms the idea of a non-linear relationship between SE components which leads to the achievement of a systemic rather than systematic education system. The idea of a non-linear

relationship between sustainability literacy and implementation asserts that procedural knowledge is in substance attainable without complete declarative knowledge and can even feed into it, and declarative knowledge is also achievable without complete procedural knowledge and can feed into it (Lukk, Veisson, & Ots, 2008).

In addition, SS instructors have outperformed in terms of Sustainability Education: Sustainability literacy can feed more into sustainability implementation than the other way around.

This finding addressed the argument between those scholars who considered sustainability literacy as a prerequisite for implementing sustainability (Cotton, Warren, Maiboroda, & Bailey, 2007), and those like Besong and Holland (2015) who insisted that re-orientation of students' knowledge and skills by teachers which is the most crucial step on the way towards sustainability development is mainly under the influence of sustainability implementation factors.

Although it is proved that a non-linear relationship between sustainability literacy and implementation can make one feed into the other one, it seems that SE is imaginable without sufficient sustainability implementation but not without adequate sustainability literacy. This finding is exactly in line with Zeeshan's assertion (2017) that if EFL instructors, for instance, merely teach language (i.e. vocabulary, grammar, communication skills, and EFL courses), they cannot be successful agents of sustainability. As a matter of fact, Zeeshan believed that in order for professors to be able to use the right teaching techniques, have an effective emotional and moral relationship with learners, and progress professionally, it is necessary to consciously increase their literacy in sustainability.

Correspondingly, this finding affirmed that every subject teacher group has certain advantages and disadvantages regarding sustainability consciousness and enactment which spotlights the importance of SE implementation as either an independent or a cross-curricular subject (Anyolo, Kärkkäinen, & Keinonen, 2018). The finding also refers to the point that all subject teachers as the main agents of SE need to be equipped with the needed competencies and relevant approaches which stimulate critical thinking, multilateral collaboration, long-term planning, and exploration in order to handle the complication of sustainability development issues. This is exactly in line with what Uitto and Saloranta (2017) found in their study regarding the perceptions and competencies of different subject teachers as educators for sustainability.

Conclusion and Implications

The present study emphasized the fact that each subject instructor group has specific merits and demerits and the instructors may not be even conscious of their competencies in SE. In-service teacher training programs and the incorporation of SE courses into teacher education will be the first main step to SE actualization. As some subjects like social sciences have more to do with sustainability issues, and as the core components of sustainability are a lot more evident in specific fields, carrying out multidisciplinary teacher training approaches can add to the breadth and depth of teacher education programs. Multidisciplinary approaches will bring about livelier and more effective teacher training programs.

The common shortcoming of the participants' sustainability implementation (i.e. curriculum reform) also highlights the point that issues related to the curriculum are not a matter of concern and priority among EFL and SS professors. The main reasons behind the negligence of curriculum reform which has been considered a major impediment in most previous studies (Jung et al., 2019; Zhao et al., 2019; Wen & Wu, 2017) are getting used to repetitive teaching resources and not spending time updating the content. This urges the education system to remind instructors of the importance of curriculum reform. However, the common strength of the participants' sustainability implementation (i.e. the ethical dimension) is good news for the education system regarding the commitment and responsibility of the instructors in higher education. The investigation of the extent of the effect and usefulness of multidisciplinary approaches needs further research.

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