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## A Study to Investigate the Sustainability Consciousness of Prospective Teachers

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**Abstract:** *The current study investigates the student-teachers' sustainability consciousness in the Pakistan context. For this purpose, public sector universities in Rawalpindi and Islamabad region offering four years undergraduate teacher-education programs were selected. The population of the current study were all the 1259 student-teachers studying in these public sector universities. A total population sampling technique was utilized due to the limited number of student-teachers in these universities. Data were collected from 753 student-teachers on the sustainability consciousness questionnaire developed by Gericke et al. (2019). An independent sample t-test and one-way ANOVA were utilized to ascertain any difference in student-teachers' sustainability consciousness based on their gender and semester of study. The results suggest that there was a significant difference in student-teachers environmental and social consciousness. However, no difference was found in the economic consciousness among the student-teachers.*

**Key Words:** : Sustainability Consciousness, Student-teachers, Education for Sustainable Development

### Introduction

For the past three decades or so, many researchers and academicians have shown interest in studying the role of education, particularly teacher education, in order to promote sustainability at all levels (Kalsoom & Khanam, 2017; Nousheen et al., 2019). The notion of sustainable development attracted the noticeable attention of educational decision-makers around the world with World Commission on Environment and Development (WCED, 1987) notable publication i.e., 'Brundtland Report' also known as 'Our Common Future. In June 1992, the foundational stone of a new field, namely

"Education for Sustainable Development (ESD)" was laid in the inaugural United Nations Conference on Environment and Development (UNCED). ESD is a paradigm shift of education aimed at building "competencies that enable individuals to engage in socio-political processes and consequently to shift their society towards sustainable development" (Barth & Rieckmann, 2016). Sustainability consciousness has been identified as one of the key outcomes of ESD (Kalsoom & Khanam, 2017) and referred to as the sustainability-related knowledge, attitude, and behaviour (Olsson et al., 2016). Sustainability is one

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of the pressing issues the current societies have been facing for long and years to come. In view of this, the educational agents i.e., prospective teachers, must be well-versed in ESD in order to promote it across the educational system. [Colás-Bravo et al. \(2018\)](#) argued that the best way to ensure a sustainable future for citizens is to develop a sustainable conscience, however, the in general the educational performance is more concerned with the content than the sustainability consciousness. Concerning this, the present study aims at exploring the SC of student-teachers studying in teacher-education programs at various public section universities and colleges in Rawalpindi and Islamabad. The investigation of SC is important to understand student-teachers knowledge, attitude, and behaviour towards to environment, society, and economy as these student-teachers will present in the future classroom and may affect their future teaching endeavors.

ESD addresses the challenges to a sustainable living like poverty, population increase, environmental degradation, social inequality and so on so forth. [Brundiers et al. \(2010\)](#) termed sustainability issues as “wicked” and complex and require urgent attention. ESD aims at empowering individuals to understand the issues pertinent to SD comprehensively and enable them to take measures at personal and common levels. The concept of SC contains two fundamental notions, i.e., sustainable development and consciousness. The SD refers to the “development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs” ([Brundtland, 1987](#)). Moreover, consciousness refers to the mindfulness and awareness pertinent to certain areas and issues. Hence, the sustainability consciousness can be referred to as the individual mindfulness regarding the sustainability-related concerns.

ESD is the process of preparing students to work and live in ways that promote economic, environmental, and social well-being today and in the future (Longhurst et al., 2014). Individuals' capacity to live in a more sustainable way may be enhanced by increasing their skills, experiences, and abilities via ESD. Teacher-education programs

have been identified as a vital factor in transforming the societies towards more sustainable living as they possess the potential to shape the knowledge, attitude, and behavior of the upcoming generations. Teacher education plays a critical role in revolutionizing education and society in order to make such a future reality ([UNESCO, 2005](#)). Teacher-education institutions are the best place to train prospective teachers for SD, which can help them teach sustainability-related and impart the necessary knowledge to the future generations. ([Ferreira et al., 2007](#)). Teachers have an important role to play at both the school and societal level ([Kane, 2007](#)). A well-established teacher-education process is vital for social transformation and sustainable growth ([Bürgener & Barth, 2018](#)). Various educational institutions have adopted efforts ranging from school gardens to sustainability certification to influence individuals' knowledge, attitudes, and behaviors (Van Poeck et al., 2018). Teachers' education has remained a critical component in achieving the UN Sustainable Development Goals (SDGs). [UNESCO \(2014\)](#) stressed teacher education as a critical component of ESD policy adoption and implementation. ESD is strategically important in terms of preparing future instructors who will be able to educate others for long-term growth ([Leal Filho & Pace, 2016](#)). Given the key role of ESD in teacher education and enabling prospective teachers to integrate ESD in educational settings, it is important to evaluate the current status of student-teachers sustainability consciousness (SC). The results of the present research will be beneficial in understanding the effectiveness of current educational practices in attaining the ESD outcomes in teacher-education programs. Therefore, the current study formulates the following objectives.

1. To explore the sustainability consciousness of prospective teachers
2. To find out the difference between the SC of prospective teachers based on gender
3. To find out the difference in perspective teachers SC based on different semesters.

### Literature review

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The term “consciousness” is a synonym for

“mindfulness” or “awareness”. Oxford dictionary describes “consciousness” in two ways: “the state of being able to use one’s senses and mental powers to understand what is happening”; or “the state of being aware of something” (Oxford, 2015). This notion corresponds with [Kollmuss and Agyeman’s \(2002\)](#) understanding of awareness. According to [Kollmuss and Agyeman \(2002\)](#), an individual’s awareness is a combination of their thoughts and feelings as well as their knowledge. The concept “pro-environmental consciousness” was developed by [Kollmuss and Agyeman \(2002\)](#) is based on their interpretation of the term consciousness. According to [Kollmuss and Agyeman \(2002\)](#), personality traits and socio-cultural factors shape the aforementioned aspects of consciousness.

The idea of sustainability consciousness (SC) has been established and operationally defined by the Karlstad Institute research team. Swedish public schools’ implementation of ESD was studied using SC as a criterion or parameter. These researchers identified sustainability consciousness as a paradigm that encompasses economic, environmental, and social dimensions of sustainable development. Moreover, under these three categories, there are further elements that explain the individual knowledge, attitudes, and behaviour toward sustainable development ([Olsson et al., 2016](#)).

[UNESCO’s \(2005\)](#) framework for integrating cultural, ecological, and economic perspectives of sustainable development serves as the foundation in the context of sustainability consciousness. The term sustainability consciousness is distinct from sustainability skills, which emphasize on ‘sustainable abilities,’ such as analyzing for future-oriented solutions, coping with uncertainties, using a multidisciplinary approach, or ability to design and execute. The term sustainability consciousness denotes knowledge of the issues pertinent to SD and the interconnectedness of three pillars of SD (Wals, 2010). [Gericke et al. \(2019\)](#) illustrate SC as “the experience or knowledge of sustainability phenomena”. [Olsson et al. \(2016\)](#) defined SC in terms of knowledge, attitudes, and behaviour pertinent to the three dimensions of SD. Each of these sustainability consciousness definitions accepts the subjective nature of the notion of consciousness.

Researchers from all around the globe have done numerous studies in a variety of circumstances. For Example, [Berglund et al. \(2014\)](#) carried out a study to examine the difference in the SC in the Swedish perspective. The researcher selected both ESD-profiled and non-ESD profiled schools in order to assess their SC. [Berglund et al. \(2014\)](#) reported an insignificant difference in sustainability consciousness of both the cohorts on the environmental and social dimension. However, the difference was found in the economic dimension. Similarly, [Olsson et al. \(2016\)](#) carried out thorough research to determine the impact of ESD on the SC of Swedish secondary school students. Their findings back with [Berglund et al., \(2014\)](#) findings that ESD profile schools have a high level of sustainability consciousness.

[Korsager and Scheie \(2019\)](#) used a qualitative case study research method to examine the influence of SD-related initiatives on students’ sustainability consciousness. They conducted a qualitative study in a Swedish perspective. According to the outcomes of their study, students’ sustainability consciousness enhanced after participating in SD-related initiatives. Similarly, [Nolan \(2020\)](#) conducted a qualitative study on Irish kids in primary schools. The study’s major purpose is to determine the usefulness of biodiversity education for primary school pupils in the state of South Carolina. The outcomes of the study show that biodiversity education increases learners’ sustainability awareness in two dimensions: environmental and social, although students’ sustainability consciousness in the economic dimension is still developing. [Nolan \(2020\)](#) recommended that biodiversity education should be introduced to help primary school pupils acquire a sense of sustainability.

[Kalsoom and Khanam \(2017\)](#) carried out research to assess student-teachers’ SC by employing an action research approach. In their work, ESD was incorporated into the “Research Methods in Education” subject, and the authors designed the course in conjunction with the various exercises and research projects to expose students to various sustainability-related issues in the local context. The study found that student-teachers’

sustainability consciousness had significantly improved at the end of the semester. [Kalsoom et al. \(2017\)](#) also carried out a similar study and compared student-teachers' sustainability consciousness with undergraduate students from various Pakistani institutions and Swedish students. The finding of the research found a significantly lower SC compared to those of Swedish students. However, the sustainability consciousness of student-teachers and other undergraduate students did not vary significantly. Similarly, [Nousheen and Kalsoom \(2022\)](#) conducted a mixed-method research study in the Pakistani context. For this research, the researchers aimed at examining how sustainability pedagogies affect student-teachers' SC in online educational settings. Sustainability pedagogies were utilized to teach various sustainability-related concepts. The results from both the quantitative and qualitative cohorts suggest that student-teachers' sustainability consciousness was significantly increased after the sustainability pedagogies intervention.

## Methodology

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The population of the current research study were all the 1259 student-teacher enrolled in undergraduate teacher-education programs in all the public sector universities in Rawalpindi and Islamabad region.

## Research Sample

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The research sample was selected through the total population sampling technique. The researcher selected the entire population as a sample for the study because it was easier for the researcher to acquire data from the entire population, According to Fraenkel (2012), researchers want to analyze the full population of interest when possible. In certain cases, the sample and population could be identical. The selected students were those who studied the subjects; Environmental education, contemporary trends and issues in education, the teaching of social studies, and Pakistan studies.

## Research Instrument

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The current study used the standardized

sustainability consciousness questionnaire (SCQ) developed by Gericke et al. (2019) to measure the sustainability awareness of students and instructors. The SCQ was developed in two versions: a short version (SCQ-S) and a long version (SCQ-L). The SCQ-L was designed to examine students' environmental, social, and economic knowledge, attitudes, and behaviour. The SCQ-L has three dimensions: sustainability knowledge, attitude, and behavior. Furthermore, each scale has three subscales, for a total of nine subscales.

## Data Collection

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The data was obtained from the selected population by personally visiting the university campuses. The research questionnaire was distributed among students-teachers in the aforementioned public sector universities. The surveys were distributed among 832 student-teachers at the end of their semesters as some students were not present in their classes due to their teaching practicum activities. Out of these 832 questionnaires, 753 questionnaires were fully filled while 79 questionnaires were returned empty or partially filled. The study experienced a high rate of return due to the limited sample size available. The response rate was about 90% which exhibits a high rate of return. All the responses were recorded in an excel sheet which was later exported to SPSS.

## Data Analysis

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The current research utilized an independent sample t-test to examine the student-teachers' sustainability consciousness based on their gender. Table 1 summarizes the results of the t-test for independent samples. The results in table 1 show that both male and female student-teachers' exhibit similar environmental knowledge ( $p > 0.05$ ). However, the results in Table 1 indicate a substantial difference in male and female student-teachers social knowledge, with male participants having higher social knowledge ( $4.19 \pm 0.54$ ) compared to their female counterparts ( $3.84 \pm 0.92$ ). Furthermore, both male and female student-teachers' reported similar economic knowledge and no substantial difference was found i.e.,  $p > 0.05$ .

The difference in male and female student-teachers environmental, social, and economic attitudes was also assessed through an independent sample t-test. The results in table 1 show no insignificant difference between male and female student-teachers' environmental, social, and economic attitudes,  $p > 0.05$ .

Moreover, the difference in the environmental, social, and economic behaviour of male and female student-teachers was assessed through an independent sample t-test. The results in table 1 suggest that there is a substantial difference in the

environmental behaviour of males ( $3.02 \pm 1.08$ ) and females ( $2.63 \pm 0.96$ ) i.e.,  $t(284.419) = 4.384, p = 0.000$ . However, both male and female student-teachers reported a below-average environmental attitude ( $M < 3$ ). Similarly, both male and female student-teachers reported a significantly different social behaviour, where male reported slightly higher social behaviour ( $3.10 \pm 0.83$ ) compared to their female counterparts ( $2.88 \pm 0.92$ ). However, the mean scores for social behaviour also suggest that both groups of student-teachers have below-average social behaviour overall.

**Table 1:** Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	SE Difference	95% Confidence Interval of the Difference	
								Lower	Upper	
Environmental knowledge	EVA	9.57	.002	1.58	751	.113	.12	.07	-.02	.27
	EVNA			1.66	340.9	.097	.12	.07	-.02	.27
Social Knowledge	EVA	47.3	.000	4.87	751	.000	.34	.07	.20	.48
	EVNA			6.29	543.8	.000	.34	.05	.23	.45
Economic Knowledge	EVA	.244	.622	-1.9	751	.057	-.16	.08	-.33	.004
	EVNA			-1.8	307.9	.060	-.16	.08	-.33	.006
Environmental Attitude	EVA	.105	.746	.59	751	.552	.05	.08	-.12	.22
	EVNA			.60	320.6	.547	.05	.08	-.11	.22
Social Attitude	EVA	56.590	.000	-1.9	751	.056	-.12	.06	-.26	.003
	EVNA			-1.6	245.0	.110	-.12	.08	-.28	.02
Economic Attitude	EVA	2.186	.140	-1.5	751	.124	-.13	.08	-.30	.03
	EVNA			-1.5	296.5	.137	-.13	.09	-.31	.04
Environmental Behaviour	EVA	20.71	.000	4.65	751	.000	.39	.08	.22	.55
	EVNA			4.38	284.4	.000	.39	.08	.21	.56
Social Behaviour	EVA	17.16	.000	2.82	751	.005	.21	.07	.06	.36
	EVNA			2.98	346	.003	.21	.07	.07	.35
Economic Behaviour	EVA	1.76	.185	.568	751	.571	.04	.08	-.12	.22
	EVNA			.555	301.8	.57	.04	.08	-.12	.22

\* EVA = Equal variances assumed

\*\* EVNA = Equal variances not assumed

In order to assess the mean difference of student-teachers' sustainability consciousness based on the semester, which they are enrolled in, the current research utilized one-way ANOVA. The results of the one-way ANOVA are summarized in table 2.

The results in table 2 student-teachers studying in various semesters have significantly different environmental knowledge ( $F(3,749) = 3.74, p = .011$ ). Moreover, a Tukey post hoc test also showed that the student-teachers studying in their 2<sup>nd</sup> (3.25

$\pm 0.93$ ,  $p=0.034$ ) and 4<sup>th</sup> ( $3.19 \pm 0.94$ ,  $p=0.008$ ) semesters have significantly lower environmental knowledge compared to student-teachers studying in their 8<sup>th</sup> semester ( $3.52 \pm 0.84$ ). Moreover, there was no student-teachers' studying in the 6<sup>th</sup> and 8<sup>th</sup> semester of the degree program exhibited similar environmental knowledge ( $p > 0.05$ ).

The one-way ANOVA findings also indicate that there is a significant difference in the social knowledge of student-teachers enrolled in different semesters ( $F(3,749) = 9.39$ ,  $p = .000$ ). Additionally, a Tukey post hoc test demonstrated that student-teachers in their second ( $3.74 \pm 0.99$ ,  $p=0.034$ ) and fourth ( $3.82 \pm 0.90$ ,  $p=0.009$ ) semesters had considerably lower social knowledge than student-teachers in their sixth ( $4.09 \pm 0.69$ ). Additionally, the Tukey post hoc test demonstrated that student-teachers in their second ( $3.74 \pm 0.99$ ,  $p = 0.000$ ) and fourth ( $3.82 \pm 0.90$ ,  $p = 0.012$ ) semesters had considerably less social knowledge than student-teachers in their eighth ( $4.11 \pm 0.67$ ). Additionally, no statistically significant difference in social knowledge was found between 2nd and 4th-semester student teachers and 6th and 8th-semester student teachers ( $p > 0.05$ ).

The one-way ANOVA findings also indicate that there is a significant variation in the economic knowledge of student-teachers enrolled in different semesters ( $F(3,749) = 2.987$ ,  $p = .030$ ). Additionally, a Tukey post hoc test indicated a significant difference in the mean economic knowledge scores of student-teachers studying in their second ( $2.79 \pm 1.01$ ,  $p=0.027$ ) and eighth ( $3.10 \pm 1.04$ ,  $p = 1.00$ ) semester. Additionally, no statistically significant difference existed between the second, fourth, and sixth semesters of student-teachers ( $p > 0.05$ ). Similarly, no statistically significant difference was found between the fourth, sixth, and eighth semesters of student-teachers ( $p > 0.05$ ). The economic knowledge mean scores of student-teachers studying in various semesters indicate a lack of economic understanding in the perspective of sustainable development.

The one-way ANOVA on environmental attitude and student-teachers semester of study also indicates that there is a significant variation in the

environmental attitude of student-teachers enrolled in different semesters ( $F(3,749) = 6.047$ ,  $p = 0.000$ ). Additionally, a Tukey post hoc test indicated a significant difference in the mean environmental attitude scores of student-teachers studying in their second ( $3.50 \pm 1.13$ ,  $p=0.12$ ) and sixth ( $3.80 \pm 0.96$ ) semester. Similarly, a significant difference in the mean environmental attitude scores of student-teachers studying in their second ( $3.50 \pm 1.13$ ,  $p=0.000$ ) and eighth ( $3.94 \pm 0.93$ ) semester was also found using the Tukey post hoc test. However, no statistically significant difference existed between the environmental attitude of second and fourth semester student teachers ( $p > 0.05$ ), and among the fourth, sixth, and eighth semesters student-teachers ( $p > 0.05$ ). The environmental attitude means a score of student-teachers studying in various semesters indicates an above-average environmental attitude mean score in the perspective of sustainable development.

The one-way ANOVA also shows that the social attitudes of student-teachers enrolled in different semesters differ significantly ( $F(3,749) = 5.620$ ,  $p < 0.001$ ). A Tukey post hoc test revealed that student-teachers in their second ( $3.50 \pm 1.13$ ,  $p=0.81$ ) and fourth ( $3.58 \pm 0.87$ ,  $p = 0.019$ ) semesters exhibit a statistically significant difference in mean social attitude score when compared to student-teachers in their eighth semester ( $3.84 \pm 0.64$ ). However, there was no statistically significant difference in social attitudes among second, fourth, and sixth semester student-teachers ( $p > 0.05$ ) and between sixth and eighth semester student teachers ( $p > 0.05$ ). The participant student-teachers reported an above average social attitude towards sustainable development.

Further, the results of the one-way ANOVA advocate that no significant difference was found in the economic attitude, environmental behaviour, social behaviour, and economic behaviour based on the student-teachers semester of study, i.e.,  $p > 0.05$ . The participant student-teachers report an above-average economic attitude while below-average environmental, social, and economic behaviour towards sustainable development.

**Table 2:** One – Way ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Environmental Knowledge	BG	9.57	3	3.193	3.738	.011
	WG	639.79	749	.854		
	Total	649.37	752			
Social Knowledge	BG	19.98	3	6.662	9.387	.000
	WG	531.54	749	.710		
	Total	551.53	752			
Economic Knowledge	BG	9.072	3	3.024	2.987	.030
	WG	758.36	749	1.013		
	Total	767.44	752			
Environmental Attitude	BG	19.14	3	6.381	6.047	.000
	WG	790.35	749	1.055		
	Total	809.49	752			
Social Attitude	BG	10.66	3	3.555	5.620	.001
	WG	473.82	749	.633		
	Total	484.48	752			
Economic Attitude	BG	6.92	3	2.307	2.122	.096
	WG	814.07	749	1.087		
	Total	820.99	752			
Environmental Behaviour	BG	6.441	3	2.147	2.119	.096
	WG	758.72	749	1.013		
	Total	765.16	752			
Social Behaviour	BG	5.27	3	1.760	2.157	.092
	WG	611.01	749	.816		
	Total	616.29	752			
Economic Behaviour	BG	.819	3	.273	.258	.856
	WG	793.44	749	1.059		
	Total	794.26	752			

\* BG = Between Groups

\*\* WG = Within Groups

## Discussion

The current study is an exploration of student-teachers sustainability consciousness in the initial teacher-education programs in Pakistan. Although the sustainability related research is in its early stages in Pakistan, the current research contributes towards the sustainability research in Pakistan by examining i) student-teachers' general sustainability consciousness, ii) gender-based differences in student-teachers SC, and iii) semester-based differences in student-teachers' SC.

The results of the current study suggest that both male and females have reported similar mean environmental and economic knowledge. The

mean environmental knowledge score for both males and females was  $M = 3.40$  and  $M = 3.27$ , respectively. These scores represent an average environmental knowledge score. Similarly, the mean economic knowledge score of males and female was  $M = 2.81$  and  $M = 2.98$ , respectively, which is slightly below the average. However, a significant difference was found in the social knowledge of male and female student-teachers, where male student-teachers reported higher mean scores ( $M = 4.19$ ) compared to their female counterparts ( $M = 3.84$ ). Similarly, the finding of the current study also suggests both male and female student-teacher have similar environmental, social, and economic attitudes based on student-teacher

gender. However, the mean score suggest that both male and female student-teachers have above average ( $M \geq 3$ ) environmental, social, and economic attitude towards sustainable development. Moreover, the results of the study also indicate that both male and females have a significant difference in their mean scores on the environmental and social behavior scale, where male exhibit higher environmental ( $M = 3.01$ ) and social ( $M = 3.10$ ) behaviour compared to female student-teacher (environmental behaviour,  $M = 2.63$ ; social behaviour,  $M = 2.88$ ). Although there was a significant difference between the male and females, however, both have average to below-average scores on both environmental and social behaviour. Furthermore, no significant difference was there between male and female student-teachers in the economic behaviour, and reported a below-average economic behaviour (Male,  $M = 2.49$ ; Female,  $M = 2.44$ ). The low environmental consciousness i.e., knowledge, attitude, and behaviour towards the environment's sustainable development, has been reported by a few researchers in the Pakistani context ([Kalsoom & Khanam, 2017](#); [Nousheen et al., 2019](#)). The low environmental consciousness may be associated with the lack of exposure towards environmental education among the Pakistani students which ultimately affect their awareness, attitude, and behaviour ([Kalsoom & Khanam, 2017](#)). The current study found some contradictory results to the previous studies on the social dimension. The previous studies low social consciousness among the Pakistani students ([Kalsoom & Khanam, 2017](#)); however, the current research found a higher social consciousness among the students. Respondents reported higher scores compared to the previous studies on the knowledge and attitude dimension of social consciousness while an average score on the behaviour scale. The main reason may be because of the ease of agreeing on social aspects compared to the other two dimensions, i.e., environmental and economic dimensions. Another reason may be the visibility and exposure of social issues. Social issues are more visible and experienced more often than environmental and economic issues. The find of the current study are in line with [Berglund and Gericke](#)

(2016) who also found higher social consciousness among the students. Lastly, economic consciousness has the lowest score among all the three dimensions of sustainability consciousness. The results are in contradiction to the previous research conducted by [Kalsoom and Khanam \(2017\)](#), who found higher scores on economic consciousness. The lower score on the economic sustainability consciousness may be subject to the unavailability of content pertinent to the economic dimension of sustainability. The curriculum in the teacher-education program does not cover the economic issues resulting in low economic knowledge, attitude, and behavior.

Another objective was to assess the difference between student-teachers sustainability consciousness based on the semester they are studying in. Based on the one-way ANOVA results, a significant difference was found in the environmental, social, and economic knowledge of student-teachers studying in various semesters. Moreover, the mean scores suggest that student-teachers studying in higher semesters have relatively higher environmental, social, and economic knowledge pertaining to sustainable development. The student-teachers reported environmental and social knowledge; however, low economic knowledge. The primary reason for this, as stated earlier, is the lack of content pertinent to economic issues in the teacher-education curriculum. On the contrary, environmental and social issues are prevalent in the syllabus and society while economic issues are not incorporated in both curriculum and teaching. At the large, the economic issues are also seen as social issues. Although, these concepts are intertwined yet, the economic perspective as a separate entity requires specific knowledge. In this perspective, the role of the teacher-educator is also important. The student-teachers knowledge may depend on both the knowledge of the teacher, curriculum, and pedagogical approaches used by the teacher-educator. Moreover, the increase in the environmental, economic, and social attitudes may be the result of the greater number of subjects student-teachers studied pertinent to sustainable development.



Similarly, the results also suggest a difference in student-teacher environmental and social attitudes based on their semester of study, where the student-teachers studying in higher semesters exhibited higher environmental and social attitudes. However, no difference was found in the student-teachers economic attitudes based on their semester of study. Moreover, the student-teachers reported above-average environmental, economic, and social attitudes with an increase with every semester. Moreover, there was no significant difference between environmental, social, and economic behaviour. Furthermore, the student-teachers reported a below average environmental, social, and economic with an insignificant increase with the increase in the semester. As, logically, the increased number of subjects studied may result in higher exposure to sustainability-related concepts and hence increased knowledge. This knowledge may affect student attitude and behaviour, although this may not always be the case. As the previous researchers also found that the sustainability curriculum affects prospective teachers' knowledge and attitude toward SD; however, the change in behaviour is not always happen ([Nousheen et al., 2019](#)). Further, the change in behaviour requires dedicated and well-directed efforts from both the teacher-educator and student-teachers to create an agency to behave in a sustainable manner.

### **Conclusion and Recommendations**

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The study aimed at exploring the student-teachers

sustainability consciousness in Rawalpindi and Islamabad region. It was found that student-teachers have above-average knowledge and attitude towards SD. However, the student-teachers report below-average behavioral dimensions. Furthermore, the economic knowledge, attitude, and behaviour was also below expectation. The results also found differences in prospective-teachers environmental, economic, and social knowledge and attitude based on their gender and the semester they are studying in. However, no significant difference was found in the behavioral aspect of all the three dimensions based on their gender and semester of study. Looking into the results of the present study, it is recommended that the future study may assess student-teachers sustainability consciousness in conjunction with the teacher-educator pedagogical approaches.

Although, the current study adds to the literature on sustainability education in the Pakistani context, however, the current study has some limitations. Due to the financial and other constraints, the current research was limited to the Rawalpindi and Islamabad region. Future studies can expand the scope of the study by incorporating other regions or by selecting a larger population. Moreover, the study was limited to teacher-education programs. Future studies may conduct similar or extended studies in other disciplines as well. Furthermore, the current study utilized a self-reporting questionnaire which provides useful yet limited information. Future studies may use other research designs like mixed method or longitudinal research designs to study this phenomenon.

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