The Degree of Science Teachers' Awareness about the Concepts and Requirements of Green Economy in the Secondary School in Amman from the Viewpoint of Teachers Themselves

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Abstract: This study aims to understand the degree of science teachers' awareness of the concepts and requirements of the green economy in the Secondary School in Amman, from the viewpoint of teachers themselves. The descriptive survey method was used in this study. To collect data, a scale consisted of 27 items distributed in 3 fields (Understand the concept and requirements of a green economy, Realizing the importance of the concept and requirements of the green economy for students, and Realizing how to use the green economy in educational curricula) with confirmed validity and reliability. This scale was applied to the samples consist of 161 (89 male and 72 female) teachers from University brigade schools in Amman. The results of the study showed that the degree of science teachers' awareness of the green economy concepts and requirements in secondary school was moderate. Moreover, it is demonstrated that there was no statistically significant difference to the degree of science teachers' awareness of the green economy requirements attributed to the variables of gender, years of service, and the interaction between them.

Keywords: Science Teachers; Green Economy; Concepts; Awareness, Secondary School

1. Introduction

The current era is witnessing rapid changes, challenges, and construction in society. At the forefront are the technical and the awareness revolution, the increase of economic competition, the growing phenomenon of globalization, the green economy, green education, and the use of information and communications technology. All of those need coexistence with all global variables to develop several purposes. First, to keep pace with those changes, challenges, and developments. Second, to prepare the individual (citizen) for living in the twenty-first century. Third, to construct their idea and refine their behaviour and conscience. Fourth, to be able to advance their community and nation in light of global trends and education construction policies that took several forms including e-learning, teacher professional construction, and other construction methods (Zaitoun, 2015).

To meet these challenges, Huaguo (2018) stresses that it is necessary to find a new form of culture and search for a suitable living environment for the future of humanity, which is the construction of green culture. People are vigorously defending the construction of environmental culture. The improvement of a green economy has become an essential means of economic development today. The background to the smooth development of this situation is the ecological culture and the green economy. The ability to achieve innovation and green technology is the central issue for developing a "green economy". "The green economy" is a type of economic behaviour that stimulates the conventional economy, or is useful in protecting environmental activities. To green the conventional economy and benefit from environmental protection activities, science and technology help is integral.

With the introduction of the technology era and the explosion of awareness, the school must keep pace with this change. This era demands teachers of the twenty-first century to possess a set of powers represented in developing higher thinking powers, managing life powers, managing students' abilities, and leading educational technology. This needs mastering the art of education, understanding the calendar, and practicing it effectively. This requires constructing teacher powers before and during service by exposing him to a set of training courses that support his work (Hefny, 2015; Forrant & Silka, 2017).

Education is one of the most essential pillars of human construction for any community as it is closely related to other indicators of construction because it has an essential role in the life of the individual, family, and community as a whole. The standards of work in the field of human construction focus on increasing the effectiveness of available services, programs, and activities that lead to facing the problems of society (Abu Al-Nasr, 2016).

Hassan (2012) notes that the educational process was linking the school and other social institutions. It works to strengthen the relationship between the school and the environment, whether nature or human. Environmental studies have acquired a prominent position between the applied and basic sciences. In addition, the scientific and applied importance of environmental planning and ecological

sciences have increased due to the occurrence of multiple exchanges between environment and development. Most countries seek to obtain a clean environment as it is one of the civilizational measures that classify people. Those measures include developing projects aimed at stimulating tree planting, reducing emissions of polluted gases, preserving wealth, rationalizing energy consumption, introducing renewable energy as a clean energy source, and addressing organic waste to reduce greenhouse gas emissions, and benefit from it in power generation (Abu Dayyeh, 2010; Hess D, Mai Q, Skaggs R, et al. 2018; Nuggent J. 2011). Interest in the concept of the green economy has increased recently even though the concern about its policies and trends is not recent. A green economy achieves sustainability in a balanced way and reduces problems caused by the traditional economy such as poverty, food security, unemployment, and lack of equitable distribution of wealth. The green economy concept provides a greater understanding of how to define development, growth, and progress (Al-Bareedi, 2015). Analogically, the "green economy" has emerged as a robust political trend in the United States of America to provide investment in infrastructure for a range of initiatives including alternative energy technologies that will reduce dependence on foreign oil supplies (Peters & Britez, 2010).

The green economy, which appeared recently, is one of the concepts that support the clean environment. The term green economy was first used by the United Nations Environment Program (UNEP) in 2008; then it was adopted by the United Nations General Assembly in January 2009 when it issued its decision to hold the (Rio + 20) conference in 2012 in Brazil entitled the green economy (Al-Fiqi, 2014). The countries participating in the (Rio 20+) Conference (2012) defined the green economy as an essential way to achieve the future that they want, which leads them to sustainable development and relieve them from poverty. Al-Fiqi (2014) defined him as an economy in which growth in income is directed at the national and global levels and in the workforce through investments made by the public and private sectors so that this enhances the efficiency of the use of natural and human resources. Chapple (2008) has defined it as improving the quality of the environment, saving clean energy, improving the use of natural resources, and the ability to produce clean power. Instead, it includes technologies that allow more honest production processes.

The thinking about the transformation of the green economy came due to the striking decline in environmental resources, economic and financial crises, as well as a collapsing global market. Therefore, the transition to a green economy requires a long and arduous process starting from the highest political legislation to the mass participation along with their interaction to achieve it (Khanfar, 2014).

Al-Fiqi (2014) indicates that the green economy adopts the use of various types of green energy generated by renewable energy sources such as wind and solar energy. Green economy also provides green employment opportunities, encourages green production including green stores, achieves real and sustainable growth, and prevents environmental pollution and natural resource depletion. Habib and Nassira (2014) state that the green economy is the main engine for achieving the dimensions of sustainable development, whether

socially, environmentally or economically, It strikes a balance between the needs of current and future generations, promotes social justice and provides job opportunities while taking into account the environmental aspects by creating more green jobs in many sectors such as agriculture, renewable energy, and others. That contributes to increasing the income of the poor and fighting poverty while preserving the environment.

The green economy requires the return of adopting national strategies for renewable energy efficiency, working to invest in water rationalization, and paying attention to the field of environmental and cultural tourism, recycling of solid waste, achieving benefit from neglected materials, and allocating important investments in scientific research. All of those aim to emphasize the green economy, the advancement and conservation of natural resources along with their exploitation to create job opportunities for citizens (Khanfar, 2014).

In the green economy category, The Hashemite Kingdom of Jordan ranked 60th out of 80 countries and 50 cities in Arabia in the 2016 green economy index issued by the Dwalesteezen Institute. This evaluation was based on the opinion of international organizations, policymakers, and private sector clients who are keen to improve their performance in the green economy (Jafra News, 2016).

The Jordanian Ministry of Environment also launched the 2018-2019 Ministry of Environment strategic plan in cooperation with the Global Institute for the Green Growth (GGGI) and partnership with all relevant authorities from the public and private sectors, non-governmental institutions, international organizations, educational institutions and universities, civil society institutions and experts. The plan is based on what has been accomplished in previous national policies and strategies and links it to the Kingdom's vision for 2025 to achieve common goals. These goals are related to economic growth and preservation of natural resources by working to develop the green growth programs in the energy, water, waste, agriculture, transport, and tourism sectors.

In the field of education, the Economic and Social Commission for Western Asia / ESCWA (2011) determined that the green economy requires changes in business practices with private sector participation provided that the educational programs and university degrees benefit from the new vision of development. In addition, it set rules concerned with the green economy and linked innovation and research systems development through coordination of relations between research institutions and the private sector. This leads to improved education and strengthened training and vocational training programs.

Samuel and Rufus (2011) pointed out that the transition to a green economy requires strengthening educational programs, adapting technologies, and strengthening development partnerships to meet contemporary environmental challenges. Meanwhile, Nawar (2013) mentioned that a green economy requires skill development, capacity building, training, and education.

Abu Alyan (2017) recommended studying the concept of the green economy as it is one of the essential and contemporary issues due to its principles which are practical instruments for achieving sustainable development, economic growth, and green job opportunities in many fields. By applying the green economy, the ten sectors identified by the United Nations Environment Program (UNEP) are energy, transport, hunting, tourism, construction, water, sanitation, technology, industry, and waste recycling.

A green economy affects adult education and workforce development. When adult workers search for skills, awareness will help them find success in work and life. Recent years have brought increased attention to green job training and discussion. Since the introduction of the Green Jobs Law in 2007, questions about how to train workers for jobs in a changing economy have attracted the attention of legislators, educators, and the public in general. Demanding new skill sets and refocused experience requires workers and educators not only to improve core skills but also to provide educational opportunities that meet the needs of the contemporary workplace (Wagner, 2013).

Among the studies related to the green economy is the review of Alex (2010) which aims to identify obstacles to implementing education for sustainable development in secondary schools in Nairobi. The study used the descriptive method with a questionnaire as the data collection method. The results showed that there is insufficient awareness of students and teachers on environmental and sustainable development issues as a result of not being included in the curricula well.

Al-Hawwal (2014) investigated the role of conscious environmental behaviour for Kuwaiti students in supporting sustainable development and revitalizing the green economy. The study adopted the descriptive-analytical method with a test as an instrument conducted on a sample of 100 (male and female) students from university colleges. The results showed general approval of the variable of conscious environmental behaviour among students and the variable of promoting sustainable development and economy revitalization. The results also showed that there were no significant differences in the conscious environmental behaviour of Kuwaiti students and the support of sustainable development and economy revitalization according to the differences in age, gender, and demographic characteristics.

The study of Gamal El-Din, Ahmed, and Hassan (2014) aimed to know the concept of green economy and its requirements in Cairo education. The study used a descriptive method that requires literature and reference analysis related to the phenomenon as an instrument. The results showed that the green economy is concerned and sought to advance the society, environment, and economy without reducing their balance while preserving future generation rights of natural resources. Besides, the basis of the green economy begins from education as one of the most important ways to modify values and attitudes.

Daoud and Ibrahim (2015) conducted a study aimed at identifying the role of the green economy in achieving sustainable development in Egypt between 1975 and 2011. The study used the inductive process in addition to using the analytical process. The results showed that the concept of sustainability means ensuring that individuals have access to development opportunities without tolerating future generations because sustainable development achieves the link between the green economy and the environment, it seeks to meet the lack of the present without neglecting the lack of future generations.

In Kazakhstan, economic reforms have impacted the environmental education system since Dlimbetova, Zhylbaev, Syylmbetova & Aliyeva (2016) conducted a study aimed at exploring how people use "green skills" in sectors such as catering, car service, and waste management. The authors conducted a social survey and observation to find out how widespread awareness, skills, opinions, and types of behaviour related to "green skills" were among respondents. The comparative analysis showed that the application of environmentally friendly operating procedures in institutions operating in the formal and informal sectors varies, in which many employees view "green skills" as environmentally friendly and do not have a proper understanding of the role of "green skills."

To find out the main aspects of developing effective national education systems to provide academic education for individuals and prepare future human resources to work within the economy in a specific way with the idea of the "green economy" Dudin et al. (2016) reached key conclusions that this period of modern culture development indicated by the aggressive and wasteful exploitation of the natural resources is about to end. The main condition for our culture to be truly sustainable is the transition to a "green economy," a new global concept that involves a trend towards ensuring social equality, availability of resources, and education on the basis that our anthropogenic and technological impact on the environment will not be aggressive. Education systems and the preparation of national human resources are the strategic basis that determines the uniqueness of national social and economic development which should be transformed and strengthened while working to thwart any disastrous scenarios for society and economic development there.

Abu Alyan's, study (2017) aimed to verify the role of the green economy in achieving sustainable development in the light of goals set by the United Nations Environment Program and economic growth in Iraq. The study adopted the descriptive-analytical method to identify the green economy and the quantitative method to analyze and explain the effect of the green economy on economic growth and unemployment by conducting a study on 80 countries including developed and developing countries. The results showed a direct connection between economic growth and the green economy index, while there was no clear connection between the green economy and unemployment.

The study of Lee & Heijden (2019) is about the influence of higher education institutions as a driver of green economic growth, especially assessing their effect on the development of green jobs. Green jobs have been described as an essential

strategy to simultaneously address economic downturn and environmental degradation. The economic awareness effect has been empirically evaluated on green jobs in the top 100 metropolitan areas in the United States. The results indicated that the departments and centers promoting higher education and sustainability have a positive effect on the development of green jobs in urban areas.

Previous studies have varied in terms of objectives, some of them pointed to factors affecting education for achieving sustainable development, such as the research of Qablain (2005) and Alex (2010), while other studies pointed to the role of the green economy in achieving sustainable development such as the studies of JamalAl-Din, Ahmed and Hassan (2014), Dawood and Ibrahim (2015), Abu Alyan (2017), and Al-Hawwal (2014).

As for the current study aimed to get acquainted with the degree of awareness of science teachers about the concepts and requirements of the green economy in the Secondary School in Amman from the teachers' viewpoint. It also varied in terms of the instrument used, since the use of the questionnaire in line with Alex research (2010), while some research agreed in the use of data analysis as a tool such as the research of JamalAl-Din, Ahmed and Hassan (2014), Dawood and Ibrahim (2015), and Abu Alian (2017). Whereas Qablain (2005) used interviews and observations, and Al-Hawwal (2014) used the test as a tool.

The current research benefited from previous studies in presenting and enriching theoretical literature, as well as in preparing an instrument for concepts and requirements of the green economy. Besides, previous studies also help in developing an environmental awareness instrument in the current research to achieve its goals, defining the used methodology, as well as interpreting and discussing the results. The current study was distinguished from other related studies as it was the first research - within the limits of researchers' awareness - that aimed to identify the degree of science teachers' awareness of the concepts and requirements of the green economy in the Secondary School in Amman from the viewpoint of teachers.

1.1. The Study Problem and its Questions

The concept of the green economy is one of the concepts seeking to achieve sustainable development by creating a clean environment, to improve environmental resource investment, and to overcome the crises experienced by societies as a result of the resource shortage. Many countries have endeavored to include the green economy culture in all economic sectors to achieve sustainable development and to alleviate the economic crises that have emerged recently. The issue of preserving the environment has become a purely pedagogical issue that relies on environmental awareness for individuals through their learning, education, and training because of the use of modern technologies accompanied by the scientific development that led to the depletion and imbalance of environmental resources (Barghouti, 2013).

JamalAl-Din (2017) points out that there are differences between development that considers the environmental aspects (green development) and economic development that was called (black development) because its priorities are purely economic and have become the subject of criticism from all circles and global institutions. To emphasize the activation of the green economy, it is vital to focus on individual environmental awareness as a necessary component. Therefore, attention should be paid to learning and teaching the goals and objectives of the green economy. In addition, the way of achieving a green economy is also vital as it includes several instruments for achieving progress in many areas that must be studied through developing educational programs that push towards sustainable development. Therefore, the role of curriculum planners is highlighted by incorporating green requirements into the curricula to fill the jobs that contribute to shaping the green economy.

The Rio 20+ Conference (2012) stated the emphasis on integrating sustainable development topics into educational materials. This Conference called for supporting educational institutions to conduct research and studies that achieve sustainable development. The study of JamalAl-Din and Ahmed and Hassan (2014) also recommended that education should play a major role in achieving the green economy concept through educational programs.

From the foregoing, the importance of Jordan's green economy can be emphasized by investing its resources and supporting the transition to a clean environment. Besides, it is also important to study its inclusion in the curricula of Jordanian universities in general and the concerned colleges in particular. Therefore, the researchers wanted to study this topic. The study problem is determined by answering the following questions:
1. "What is the degree of science teachers' awareness about the concepts and requirements of the green economy in secondary schools in Amman from their point of view?"
2. "Are there statistically significant differences in the degree of awareness of science teachers about the concepts and requirements of the green economy in the secondary school in Amman from their point of view attributed to the variables of (gender, years of service and interaction between them)?"

1.2. The Aims of this Study
The study aims to recognize the degree of science teachers' awareness of the green economy concepts and requirements in a secondary school in Amman from their point of view. In addition, this study also aims to know whether there are statistically significant differences attributed to the variables of (gender, years of service and interaction between them).

1.3. The Significance of the Study
It is hoped that this study enriches theoretical literature in libraries and can be used as a suitable theoretical reference for the requirements of the green economy. Besides, it is hoped that this study may serve researchers and those interested in this field. Its results are expected to benefit the officials of the Jordanian Ministry of Education to direct the evaluation of the curricula in the relevant disciplines.

The educational authorities may benefit from it to plan methodological and non-curricular activities at different levels of academic stages.

1.4. Study Terms
Green Economy is defined by the United Nations Environment Program (2011) as the economy that results in an improvement in human well-being and realization of the principle of social equality, while notably reducing environmental risks and environmental shortages.
Green economy requirements are a set of needs that, if available, is applied to a green economy that seeks to provide green sectors for sustainable development. Procedurally, it is defined as the degree obtained by the members of the study sample to answer the items of the green economy instrument.

1.5. Limitations of the Study
The study sample was limited to a group of science teachers of the secondary school in Amman for the first semester of the 2019/2020 academic year. The extent of the validity and reliability of the study instrument as well as the accuracy and objectivity of the response of the sample members were also limited. Its results are only circulated to the same community from which the sample was drawn and other similar societies.

2. Research Method and Procedures

The study used the descriptive method based on describing, explaining, and analyzing a phenomenon.

2.1. Study Population and Sample
The study population consists of all 284 teachers of secondary school in Amman, the university district Amman. However, following the official statistics obtained by researchers from the Queen Rania Center for Education and Information Technology, the sample consisted of only 161 male and female teachers chosen in a simple random manner. Table 1 shows the distribution of the study sample according to their variables.

Table 1: Distribution of study sample individuals according to their variables

variable	Level / Category	Number	percentage
Gender	Male	89	60.8
	Female	72	39.2
	Total	161	100.0
Years of service	Less than five years	41	25.4
	From five to ten years	54	33.5
	More than ten years	66	41.1
	Total	**161**	**100.0**

2.2. Instrument

To collect study data and then answer its questions, a questionnaire, as the study instrument, was developed to identify the degree of science teacher's awareness about the concepts and requirements of the green economy in the secondary school in the Amman from the viewpoint of science teachers. This instrument was developed after referring to the theoretical research including some Arab and foreign research and previous studies related to the subject of the survey conducted in this field as the study of Alex (2010) and the study of Abu Alyan (2017). The questionnaire, in its primary form, consists of 27 items distributed in three fields (awareness of the concept and elements of the green economy, awareness of the importance of the idea and elements of green economy for students, awareness of how to use green economy in educational curricula). Table (2) shows the distribution of the number of items in these fields.

Table 2: Distribution of items of the study instrument in its fields

Sequence	Fields of a study instrument	The number of items
1	Understand the concept and requirements of a green economy	9
2	Realizing the importance of the concept and requirements of the green economy for students	9
3	Realizing how to use the green economy in educational curricula	9
	Total sum	**27**

A five-layer Likert scale was used, as five levels were identified as alternatives as follows: very high degree of awareness (5), a high degree of awareness (4), medium degree of awareness (3), low degree of awareness (2), very low degree of awareness (1).
The category length was calculated as the following:
Category Length: (5-1) / 3 = 1.33.
The degree of awareness was determined as follows:
Degree of awareness category
Low degree of awareness   1 - 2.33
A moderate degree of awareness   from 2.34 - less than 3.67
A high degree of awareness   from 3.67 – 5

2.3. Validity

To ensure the validity of the study instrument, it was presented to a group of referees from the Faculty of Educational Sciences at Jordanian public and private universities. This is to judge the extent to which the items belong to the fields in which they were placed, and the extent of their validity and comprehensiveness, as well as to assess the level of language drafting or any other notes they see appropriate to the amendment, change, or deletion. The items that obtained 80%

or more referees' approval were retained and the necessary amendments proposed by the referees were made that resulted in 27 valid items included in the questionnaire. The validity of the internal consistency was also verified by calculating the correlation coefficients between the items and the instrument as a whole and Table 3 shows the results of this analysis.

Table 3: Correlation coefficients between paragraphs and the overall instrument with domains

Items	Correlation coefficient	Significance level	Items	Correlation coefficient	Significance level
1	0.64	0.000	15	0.59	0.000
2	0.48	0.007	16	0.44	0.014
3	0.40	0.009	17	0.64	0.000
4	0.69	0.001	18	0.54	0.002
5	0.67	0.000	19	0.66	0.000
6	0.43	0.002	20	0.68	0.007
7	0.69	0.000	21	0.71	0.000
8	0.55	0.016	22	0.55	0.001
9	0.44	0.000	23	0.44	0.000
10	0.67	0.000	24	0.67	0.002
11	0.59	0.014	25	0.59	0.000
12	0.44	0.000	26	0.44	0.016
13	0.49	0.002	27	0.64	0.000
14	0.45	0.000			

It is noted from the analysis results of Table 3 that all the values of correlation coefficients were both acceptable in the research and statistically significant at the level of significance ($\alpha = 0.05$) ranging between 0.71 - 0.43. This enhances the validity of the study's internal consistency and appropriateness.

2.4. Reliability

To verify the consistency of the study instrument, it was applied to a survey sample consisting of 25 science teachers from the study population and external samples using re-application after two weeks. Table 4 shows the results of this analysis.

Table 4: Alpha consistency coefficients for the Cronbach alpha tool

Fields	Cronbach's alpha coefficients
Understanding the concept and requirements of a green economy	0.82
Recognizing the importance of the concept and requirements of the green economy	0.77
Recognizing how to use the green economy in educational curricula	0.83
Total	**0.88**

It is noted from the analysis results that all the values of the stability coefficients were relatively high. This enhances the stability and accuracy of the instrument and its suitability to obtain accurate results.

2.5. Study variables
The current study included the following variables:
Independent variables, including:
Gender category: male teacher and female teacher category.
Years of service category: less than 5 years, 5-10 years, and 10 years or more.
The dependent variable is represented by the degree of science teachers' awareness about the concepts and requirements of the green economy in the upper basic stage in Amman from the viewpoint of teachers and supervisors.

2.6. Statistical processing
To answer the first question, arithmetic averages, standard deviations and ranks were used. To answer the second question, the values of the mean and standard deviations were calculated. Finally, to reveal the significance of the differences, the multiple variance analysis was used.

2.7. Study procedures
The following procedures were followed to implement and apply the study:
- View the relevant theoretical literature.
- Determine the study population and sample.
- Develop the study instrument.
- Find the validity of the instrument by presenting it to competent referees and statistical treatment.
- Calculate the stability of the study instrument.
- Distribute the questionnaire to the study samples.
- Restore the distributed questionnaires.
- Monitor data in special tables.
- Analyze statistical data.
- View and discuss data.
- Provide recommendations and suggestions.

3. Findings and Discussions

To answer this question, mathematical averages, standard deviations, and ranks were extracted to the degree of science teachers' awareness of the concepts and requirements of green economics in the upper secondary stage in the capital, Amman, from their point of view. Table (5) shows the results of the analysis:

Table 5: Means, standard deviations, and ranks for the degree of science teachers' awareness about the concepts and requirements of the green economy

	Rank	The item number	items	Mean	standard deviation	Degree of Awareness
Understand the concept and requirements of a green economy	1	3	I understand the importance of vocational training programs to enhance my ability in the green economy.	3.33	0.77	High
	2	9	I am aware of environmental issues related to the water field.	3.19	0.75	High
	3	8	I appreciate the importance of using alternative energy that reduces environmental pollution	2.68	0.65	Moderate
	4	6	I understand the active role of waste recycling in preserving the environment.	2.98	0.78	Moderate
	5	1	I think the recycling of plastic and glass materials is good.	2.60	0.81	Moderate
	6	4	I do research and review references for topics related to the green economy.	2.20	0.79	Moderate
	7	2	I appreciate that continuing environmental awareness campaigns contribute to the spread and promotion of a green economy culture.	2.98	0.79	Moderate
	8	5	I realize the importance of using methods that reduce environmental pollution.	2.39	0.90	Moderate
	9	7	I have a sense of responsibility to protect the environment.	2.93	0.53	Moderate
The field as a whole				**2.93**	**0.53**	Moderate
Realizing the importance of the concept and requirements of the green economy	10	17	I am interested in providing systematic, non-class activities that maintain a clean environment.	**2.79**	**0.69**	Moderate
	11	18	I tell my students about the importance of using various energy sources and making good use of them.	2.87	0.78	Moderate
	12	15	I urge my students to rationalize and conserve energy.	**2.34**	**0.65**	Moderate
	13	10	I am trying to transfer the impact of learning that includes environmental issues and its application inside and outside the school.	**2.91**	**0.79**	Moderate

	14	12	I consider accuracy and clarity in transferring environmental information to my students.	**2.77**	**0.90**	Moderate
	15	11	I seek to establish a practice in my students in a way that achieves a clean environment.	**2.50**	**0.69**	Moderate
Realizing how to use the green economy in educational curricula	16	14	I offer lab experiences for my students, providing practical experiences that are concerned with the green economy.	**3.16**	**0.75**	High
	17	13	I am interested in providing systematic, non-class activities that maintain a clean environment.	**3.01**	**0.76**	High
	18	16	I encourage my students to place recyclable materials (paper, plastic, metal) in their designated places.	**2.64**	**0.70**	High
The field as a whole				**2.77**	**0.61**	Moderate
	19	22	The science curriculum motivates me to scientific research to develop green technology.	**2.81**	**0.80**	Moderate
	20	25	The curriculum encourages the necessity of viewing library resources and references to enrich their awareness about the green economy.	**3.50**	**0.78**	High
	21	20	The science curriculum offers a variety of learning opportunities linked to the requirements of a green economy.	**2.27**	**0.62**	Moderate
	22	27	The science curricula cover environmental topics that support the preservation of environmental resources.	**2.11**	**0.68**	Moderate
	23	24	The science curriculum promotes the concept of environmental conservation through my discussions with students.	**2.24**	**0.63**	Moderate
	24	26	Science curricula help to create solutions to environmental problems.	**2.27**	**0.68**	Moderate
	25	19	The science curriculum is concerned with providing systematic, non-class	**2.61**	**0.75**	Moderate

			activities that maintain a clean environment.			
	26	21	Science curricula encourage the publication of posters related to awareness of the green economy.	**2.51**	**0.74**	Moderate
	27	23	The science curriculum promotes the concept of environmental conservation through my discussions with students.	**2.48**	**0.71**	Moderate
The field as a whole				**2.53**	**0.63**	Moderate
The degree for the instrument as a whole				**2.71**	**0.33**	Moderate

It is noted from Table 5 that the arithmetic averages, standard deviations, and ranks show the highest degree for the field of realizing the concept and requirements of the green economy, as the arithmetic average reaches 2.80 and the moderate evaluation degree. The field of realizing how to use the green economy for students came in second place since the arithmetic average reaches 2.77 with a moderate evaluation degree. Following that, the field of realizing how to use the green economy in educational curricula came in the third and last rank since the arithmetic average reaches 2.53 with a moderate degree. Meanwhile, the total arithmetic means on the study as a whole reach 2.71 with a moderate evaluation degree. The table shows the arithmetic averages, standard deviations, and ranks for each item in the fields to which they belong, as they were as follows:

First: The realization of the concept and requirements of the green economy
It is noted that means for the items in the realization of the concept and requirements of the green economy ranged between 2.20 - 3.33 and the level of evaluation ranged from high to medium from the degree of estimation for the items. As for the field as a whole, it obtained a moderate arithmetic average of 2.80 and a standard deviation of 0.56 with a moderate evaluation degree. Individually, item 3 states "I understand the importance of vocational training programs to enhance my ability in the field of the green economy" ranked first since the arithmetic mean reaches 3.33 with a standard deviation reaches 0.77 and a high evaluation degree. The item 7, which states "I conduct research and review references for issues related to the green economy" ranked last since the mean reaches 2.20 and the standard deviation reaches 0.79 with a moderate evaluation degree.

Second: The realization of the importance of the concept and requirements of the green economy
It is noted from the table that the arithmetic averages on the field of cultural awareness ranged between 2.34 - 3.16 with a moderate evaluation degree from the degree of estimation of all items. Meanwhile, the field as a whole obtained an arithmetic average of 2.77 and a standard deviation of 0.61 with a moderate evaluation degree. In this field, item 16, which states "I offer laboratory experiments when my students provide practical experiences that are concerned

with the green economy", ranked first with an arithmetic average of 3.16 and with a standard deviation of 0.75 with a high evaluation degree.

Third: The field of realizing how to use the green economy in educational curricula

From the table, the arithmetic means for each item of the field of the realization of how to use the green economy in educational curricula range between 3.36-3.75 with an evaluation degree ranges between high to the medium. As for the field as a whole, the arithmetic average reaches 3.53 and the standard deviation reaches 0.63 with a very high evaluation level.

Item 22 states "Curricula encourage the necessity of accessing library resources and references to enrich their awareness about economics" ranked first with an arithmetic average of 3.50 and a standard deviation of 0.78 at a high evaluation degree. Item 23 that states "The science curriculum deals with environmental issues that support the preservation of environmental resources" came in the last rank with an arithmetic average of 2.48 and a standard deviation of 0.71 at a moderate evaluation level. This result can be attributed to the fact that the requirements of the green economy are still not clear to science teachers which showed an average degree of awareness in their responses to the study instrument.

Results related to answering the second question:

To answer this question, arithmetic averages and standard deviations were extracted to the degree of science teachers' awareness of the green economy requirements in the upper secondary stage in Amman from the teachers' point of view according to different study variables (gender and years of service). Those results are shown in the table below.

Table 6: Means and Standard Deviations for the Degree of Science Teachers'Awareness of the Green Economy Requirements

Gender	Experience	Number	SMA*	standard deviation
Male	5 years or less	18	2.78	0.39
	From 5 years to less than 10 years	29	2.76	0.34
	10 years and more	42	2.66	0.36
	Total	89	2.72	0.36
Female	5 years or less	23	2.75	0.22
	From 5 years to less than 10 years	25	2.65	0.32
	10 years and more	24	2.69	0.36
	Total	72	2.70	0.31
Total	5 years or less	41	2.77	0.30
	From 5 years to less than 10 years	54	2.71	0.33
	10 years and more	66	2.67	0.36
Total		**161**	**2.71**	**0.33**

* A maximum score of 5

It is noted from Table 6 that there are apparent differences between the averages and the standard deviations of the responses given by the study sample individuals. These differences in the fields of the degree of science teachers' awareness about the green economy concepts and requirements in the upper secondary stage in Amman from the teachers' point of view attributed to the variables of gender and years of experience. To reveal the significance of these differences in the arithmetic mean, two-factor analysis of variance with a factor design of 3 × 2 was used. Table 7 shows a summary of this.

Table 7: The test results of multiple variance analysis of the gender and experience impact on the field of the degree of science teachers' awareness about the green economy concepts and requirements

Variables	The field	Sum of squares	Degrees of freedom	Squares Average	F value	Level of statistical significance	Eta Squared
Gender	Understanding the concept and requirements of a green economy	0.534	1	0.534	3.830	0.052	0.024
	Realizing the importance of the concept and requirements of the green economy for students	0.002	1	0.002	0.011	0.918	0.000
	Realizing how to use the green economy in educational curricula	0.044	1	0.044	0.203	0.653	0.001
	Overall performance	0.054	1	0.054	0.465	0.496	0.003
Years of experience	Understanding the concept and requirements of a green economy	0.017	2	0.008	0.061	0.941	0.001
	Realizing the importance of the concept and requirements of the green economy for students	0.584		0.292	1.566	0.212	0.020
	Realizing how to use the green economy in educational curricula	0.896		0.448	2.065	0.130	0.026
	Overall performance	0.215		0.107	0.923	0.399	0.012
Interaction	Understanding the concept and requirements of a green economy	0.003		0.001	0.009	0.991	0.000
	Realizing the importance of the concept and requirements of the green economy for students	0.238		0.119	0.637	.0.530	0.008
	Realizing how to use the green economy in educational curricula	0.722		0.361	1.662	0.193	0.021
	Overall performance	0.134		0.067			
Error	Understanding the concept and requirements of a green economy	21.614		0.139			

	Realizing the importance of the concept and requirements of the green economy for students	28.971		0.187	
	Realizing how to use the green economy in educational curricula	33.642		0.217	
	Overall performance	18.048		0.116	
Total	Understanding the concept and requirements of a green economy	22.201			
	Realizing the importance of the concept and requirements of the green economy for students	29.796			
	Realizing how to use the green economy in educational curricula	35.673			
	Overall performance	18.460			

*Statistical significance level (α = 0.05)

The results of Table 7 show there are no statistically significant differences at the level of statistical significance (α = 0.05) between the averages of the individuals of the study sample in all fields. Besides, there are no statistically significant differences at α = 0.05 attributed to the variable of gender.

This means that the degree of science teachers' awareness about the green economy concepts and requirements in each of the three areas related to the degree of awareness and in the fields combined (the instrument as a whole) is one regardless of their gender. This indicates that the degree of science teachers' awareness does not differ according to gender. This result can be explained by the fact that male and female teachers have been subjected to the same information and concepts related to the green economy and its requirements as they are subjected to the same training courses during the service. In addition, the surrounding influences and media contribute to creating a degree of awareness of the green economy concepts and requirements among teachers. The local environment where both male and female teachers live in the same and issues related to the green economy are similar which are reflected in the existence of convergence in the degree of awareness between them.

There were no statistically significant differences at the level of α = 0.05 between the averages of the study sample individuals in all fields attributed to the variable of years of service. Likewise, there were no statistically significant differences at the level of 0.05 = α on the instrument as a whole attributed to the years of service variable.

This means that the degree of science teachers' awareness about the green economy concepts and requirements in each of the three fields related to the level of awareness and in the combined fields (instrument) as a whole was not related to the number of their years of experience. In the sense that the degree of

awareness of the green economy concepts and requirements among science teachers did not differ according to the number of years of experience (less than 5 years, 5-10 years, 10 years or more. This result can be attributed to the fact that science teachers have common denominators regarding the process of creating the degree of awareness concerning the green economy concepts and requirements in the upper secondary stage since they have been subjected to one pre-service course. Further, the teachers' educational experiences are academic in the field of specialization and not in the field of teaching green economy issues. Hence, in the degree of awareness, the experience factor does not consider an environmental impact for them.

There was no statistically significant differences at the level of α = 0.05 between the averages of the study sample in all fields attributed to the interaction between the two variables (gender and years of experience), and the absence of statistically significant differences at the level of statistical significance (α = 0.05) on the instrument as a whole attributed to the interaction.

This means that the degree of science teachers' awareness about the green economy concepts and requirements in each of the three fields related to the level of awareness and in the combined fields (instrument as a whole) is not related to the interaction between gender and number of years of experience. This means that the two variables (gender and years of service) are not interactive and therefore independent. This makes the effect of one level does not differ with the change of the other levels.

4. Conclusion and Recommendations

The concept and requirements of the green economy are still not clear to science teachers which showed an average degree of awareness in their responses to the study instrument and the green economy concepts and requirements. In each of the three areas related to the degree of awareness and in the fields combined, it is demonstrated that they have the same degree regardless of their gender and years of service. Science teachers have common denominators regarding the process of creating a degree of awareness of the green economy concepts and requirements in the upper secondary stage. Consequently, the degree of awareness is not an environmental impact factor.

From the results, the study recommends working to update and develop science curricula according to the requirements of needs and environmental changes. In addition, creating various learning opportunities related to the green economy and setting environmental strategies that support the green economy concept along with its inclusion in science curricula are also required. Finally, reviewing methodological and extracurricular activities inside and outside the school and holding seminars and workshops are needed to increase students' awareness of the economic awareness concept.

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