

Article

Challenges to Teachers Implementing Sustainable Development Goals Frameworks in Qatar

Noor Hamwy ¹, Jennifer Bruder ¹, Abdellatif Sellami ² and Michael H. Romanowski ^{2,*}

¹ Arts and Sciences, Carnegie Mellon University in Qatar, Doha P.O. Box 24866, Qatar; nhamwy@andrew.cmu.edu (N.H.); jbruder@andrew.cmu.edu (J.B.)

² Educational Research Center, Qatar University, Doha P.O. Box 2713, Qatar; asellami@qu.edu.qa

* Correspondence: michaelhr@qu.edu.qa

Abstract: Teachers play an essential role in teaching sustainable development to students. Consequently, understanding the challenges that hamper effective instruction is crucial. This study explored the challenges preparatory and secondary school teachers face in Qatar's public and private schools when teaching Education for Sustainable Development (ESD) and Global Citizenship Education (GCED). The study utilized an adapted version of UNESCO's global survey to investigate these challenges and shed light on the obstacles that impede effective instruction in these essential domains. Teachers' (N = 981) challenges were assessed according to curricular, cultural, and environmental challenges associated with teaching sustainability. The study results indicated that more than half of public and private school teachers faced moderate to significant challenges when teaching ESD and/or GCED themes. Sustainable Consumption and Production was perceived as the most challenging teaching theme, with the least curriculum coverage. Results indicated that private school teachers report more significant challenges in teaching and assessing ESD/GCED themes than public school teachers across the four sustainability themes. Detailed discussion regarding these findings is provided. This article contributes to the wider academic conversation by examining the practical challenges teachers face in Qatar as they implement ESD and GCED.

Keywords: education for sustainable development; global citizenship education; teachers; challenges to sustainable development goals; Qatar; public and private schools



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1. Introduction

Education for sustainable development (ESD) is a crucial element of global, regional, and national policy frameworks aimed at accomplishing equitable and environmentally responsible development by offering everyone comprehensive, fair, and high-quality education [1]. The 2030 Agenda for Sustainable Development, comprising the 17 Sustainable Development Goals (SDGs), was globally acknowledged by leaders and officially implemented in September 2015 [2]. The United Nations has called on all states to engage in actions that support economic growth while safeguarding the environment. Despite the lack of legal obligation accompanying the SDGs, governments are anticipated to take responsibility and create domestic structures to attain all 17 goals [3].

Within the present state of non-sustainability in which we reside, education is an essential foundation for effecting societal change toward sustainable development [4]. The recognition of education as an agent of change toward sustainable development has underscored the crucial role of teachers in contributing to quality education delivery [5]. Educators play an essential role in conveying sustainable development information and promoting the acquisition of skills and competencies necessary to accomplish these objectives [6]. However, teachers face many challenges that hinder their teaching of SDGs [7,8]. Hence, it is imperative to comprehend the viewpoints of educators regarding the challenges and difficulties they encounter while imparting knowledge on sustainable development.

Identifying and overcoming these challenges is essential to effectively delivering knowledge and skills related to ESD.

The present study focuses on the challenges teachers face as they instruct students in teaching ESD and GCED. Some studies investigated challenges to teaching sustainable development and global citizenship (e.g., [9–11]). Other research conducted in the context of Qatar has examined challenges specific to the Qatar Education System [7]. However, a gap identified in the existing research is the lack of studies that offer comparative perspectives on the challenges that public and private school teachers face teaching ESD and GCED. This study aims to advance the understanding of teachers' challenges by surveying teachers in Qatar's preparatory and secondary public and private schools. By presenting a contextualized non-Western Arabian Gulf perspective, this study provides insight into the challenges to ESD and GCED in public and private schools.

This paper is structured as follows: To begin, we establish the fundamental concepts of education for sustainable development and global citizenship education as applied within the scope of this study. Next, we outline several studies investigating how the challenges that teachers have identified hamper teaching education for ESD and GCED. We then provide a context by discussing Qatar's education regarding the SDGs, followed by a description of the research methods and design. Finally, the findings from survey responses and a discussion of them are offered before providing concluding remarks. The paper concludes with policy-relevant recommendations.

2. Defining ESD and GCED

ESD and GCED play crucial roles in achieving the SDGs outlined by the United Nations, highlighting the importance for individuals to possess the required knowledge and competencies to effectively address the complexities of fostering a sustainable global society [12]. For the scope of this study, we adopted the definition of ESD from UNESCO, which offers a comprehensive understanding. UNESCO defines ESD as "the process of equipping students with the knowledge and understanding, competencies, skills, and attributes needed to work and live in a way that safeguards environmental, social and economic wellbeing, both in the present and for future generations" [13]. Furthermore, ESD is a form of education emphasizing the interconnectedness and contextual dependencies of issues within local, regional, and global contexts [12]. Strachan [13] argues that ESD moves beyond developing separate degree programs or specialized courses on sustainability. Instead, it requires integrating ESD into all aspects of our educational system, including formal and informal curricula, teaching methods, curriculum approval, quality assurance, evaluation procedures, and institutional governance structures.

Regarding GCED, this education is considered the contemporary model of civic education in the 21st century. The significance lies in equipping students with the necessary competencies, skills, and aptitude to effectively address the complexities and issues of the current era [14]. GCED includes providing education encompassing peace education, human rights education, global citizenship, intercultural dialogue education, and sustainable development education [15]. Consequently, it is imperative to incorporate global citizenship studies into the civic education curriculum.

3. Challenges to Teachers Implementing SDGs

Myriad challenges have been identified in the literature, which prevents teachers from effective instruction. For this study, we adapted and applied DaRosa's [8] challenges that impede the effective teaching of the SDGs as a framework. As noted in the literature, this model is based on effective teaching and has been used with medical school faculty members. The framework provides a comprehensive approach to addressing challenges to effective teaching and is particularly useful in teaching sustainability. It includes teaching and curricular challenges (challenges to effective teaching and curriculum issues), cultural (educators' attitudes and cultural traditions that influence teaching sustainability), environmental (challenges connected to the settings where education takes place, such as time

and access to instructional resources), and financial challenges (the revenue and resources needed to teach sustainability).

Before this discussion proceeds, we provide an essential caveat. DeRosa's framework encompasses four distinct categories, including financial challenges. However, the survey utilized in this study does not distribute evenly along these categories. Notably, the findings suggest that schools and educators in Qatar have the necessary funding to facilitate the instruction of Environmental and Global Citizenship Education. One could argue that because of Qatar's investment in education, teachers do not face these challenges to the extent they do others; For example, Qatar's 2020 budget allocates around 10% of its total educational expenses, amounting to QR22 billion (\$6.1 bn), among the most significant investments in the Middle East and North Africa (MENA) region [16]. The education sector is undertaking substantial projects such as enlarging the network of schools, universities, and educational facilities, including funding for SDG projects. Therefore, we utilize three overarching categories: Teaching and Curricular, Cultural, and Environmental Challenges.

3.1. Teaching and Curricular Challenges

Much research has reported challenges centered on teaching and the curriculum that hinders teachers from teaching the SDGs (e.g., [16–18]). Regarding instruction and the SDGs, research has demonstrated that teachers are not yet equipped to teach the SDGs [19,20]. Furthermore, teachers lack the required knowledge or expertise to teach the SDGs [11,18,21] and lack professional training on pedagogies and the teaching skills necessary for teaching them, hampering the implementation of the SDGs [17,18,22]. UNESCO [23] reports that a barrier to teaching ESD and GCED includes schools lacking basic facilities and technology. Teacher readiness can be a barrier to effective teaching of ESD and GCED. Teachers' lack of understanding and knowledge inhibits the promotion of ESD/GCED [24,25]. There are concerns regarding the assessment practices of SDGs [7,12,26]. UNESCO [27] reported that 40 percent of surveyed teachers found the assessment of ESD and GCED to be significantly difficult, with more than one-third of teachers stating they needed to possess the tools or guidelines for assessing interdisciplinary topics.

Finally, it is commonly accepted that teacher education is a pivotal factor in attaining the SDG 4 objectives [28] and that insufficient teacher preparation contributes to weakness in environmental education [29,30]. Various investigations have pinpointed crucial elements of sustainable development that should be integrated into teacher education curricula to adequately prepare instructors for attaining SDG 4. The pertinent features are comprehension of sustainability, tactics for managing behavior, regulations, and policies, comprehensive principles, and proficiency in pedagogical skills [31,32]. Furthermore, UNESCO [23] reported that according to educators, teacher training programs inadequately address sustainable consumption and production and climate change. Educators with greater educational attainment and teaching experience express greater aptitude and self-assurance in instructing on ESD and GCED subjects.

Regarding curricular challenges, research reveals that teachers did not have access to SDGs teaching materials and resources [33–36], lacked helpful examples of how to include SDGs in their teaching [11], and faced an overcrowded curriculum [23,33,37]. In addition, UNESCO [23] reported that a barrier for teachers was the lack of appropriate equipment and tools and the absence of coverage of ESD and GCED themes in the curriculum. Kioupi and Voulvoulis [33] found that educational settings must define sustainability better. As a result, learning outcomes related to sustainability frequently lack clarity and definition. Some teachers have also indicated that current curricula are too rigid and inflexible and do not allow creativity and innovation [25]. Furthermore, the lack of global guidelines for ESD fails to support educational systems in enabling the transformational social change necessary for sustainability [33].

3.2. Cultural Challenges

The role of culture in achieving SDGs is critical. The extensive frequency of apathetic cultures and societal pursuits poses a challenge for nations pursuing sustainable development [38]. According to Zheng et al. [39], culture plays a significant role in achieving the 17 SDGs, comprising 79% of the total SDG targets. Furthermore, Zheng et al. [39] continue by reporting that an empirical comprehension from an analysis of panel data reveals that up to 26% of the variances in the attainment of the SDGs can be attributed to cultural values. However, the associations between cultural attributes and indicators are notably disparate.

The scholars mentioned above highlight that a cultural characteristic can positively correlate with acquiring certain Sustainable Development Indicators (SDIs) while concurrently displaying a negative correlation with other SDIs. For example, the presence of cultural values that promote a lifestyle reliant on high levels of carbon emissions, particularly concerning transportation, consumption habits, and residential preferences, may result in a situation where these behaviors become ingrained and difficult to change, leading to continued high levels of carbon emissions [40]. Another example is the adoption of energy efficiency technologies and the transition towards low-carbon energy in the United States, which may face cultural challenges if climate-friendly alternatives compromise individuals' sense of freedom and control over their environment [39]. The key is that beliefs and the political and cultural background can impede efforts related to sustainability, and any integration necessitates a firm commitment to change on both cultural and institutional levels.

Culture also influences the choice, selection, and decision to include various topics in sustainability since these matters can be controversial. Current research indicates that psychological variables and SDG-related knowledge significantly impact an individual's SDG involvement [41–43]. Although actions are vital to achieving sustainability, attitude is more fundamental and crucial [44]. This includes teachers' beliefs, views, opinions, and attitudes toward ESD, which can be an instruction barrier [45–47]. For example, language teachers' negative attitudes and beliefs can harm their teaching and interactions with students, hindering their ability to take responsibility for developing the economy, civil society, and natural resources [48,49]. Finally, teachers have reported that contentious subjects can hinder sustainability instruction, such as climate change in particular cultural settings [23,50].

3.3. Environmental Challenges

Research has identified several environmental challenges teachers face when implementing ESD/GCED. Environmental challenges are those that are imposed on teachers by educational structures. According to Veiga Ávila et al. [9], the leading environmental obstacles to effective instruction of ESD/GCED were lack of planning and focus, lack of an environmental committee, lack of applicability and continuity of actions, and resistance to changes. For example, schools often lack a plan for implementation and adequate support to produce high levels of sustained implementation [51]. Furthermore, schools often lack systemic delivery of the ESD concepts making it more difficult for teachers to instruct students in ESD/GCED [11,22].

School bureaucracy detracts from central issues of ESD and has a tangible impact on the actual implementation of projects [38,52]. Teachers often criticize higher authorities' many requirements and obligations as a barrier to teaching ESD/GCED [52]. Furthermore, the school's lack of priority [53,54], the lack of school leaders' support [23,52], and the lack of prioritizing sustainability in national assessments [23] is a challenge to the teaching of ESD/GCED.

Individual school structures, procedures, and requirements can hamper the teaching of ESD/GCED. Several studies investigating teachers found that time constraints [20,23] and heavy workloads hinder the teaching of ESD/GCED [5,19,23]. Finally, UNESCO [23] reports that the lack of basic facilities and technology in schools is a critical barrier to the effective teaching of ESD/GCED.

Schools often have a change-resistant organizational culture that hampers new initiatives, often reflected by principal and teacher resistance. Principal and teacher resistance can hinder the implementation of ESD and GCED instruction [55–57]. For example, teachers have resisted sustainability instruction because of work overload [23], while teachers' and principals' resistance to teaching topics has been reported due to their controversial nature [23,58]. For example, it is plausible that a significant proportion of seasoned educators possess an educational background and may consider seeking consensus as a preferable alternative to confronting conflict [58]. However, the degree to which principals and teachers resist ESD and GCED instruction may differ based on the organizational framework of the school [46].

4. Context: Qatar, Schools, and ESD

The Qatar National Vision (QNV) 2030 was created to transform Qatar into an advanced knowledge-based society that provides a high standard of living for all its citizens [59]. Al-Thani et al. [5] assert that the vision encompasses SDGs, ethical principles for environmental preservation and protection, and raising awareness about environmental issues among the population. Consequently, educational curricula and training programs catering to Qatar's present and future requirements are significant [60]. Qatar has shown a keen interest in promoting sustainability and integrating sustainable development concepts into its educational system.

Qatar's educational framework comprises both public and private schools. The public sector includes 318 schools, enrolling over 126,000 students and employing 10,995 instructors for preparatory and secondary-level education [61]. Private schools offer an alternative to K-12 public schools, featuring distinct languages and curricula regulated by the Ministry of Education and Higher Education (MEHE). Private educational institutions depend on tuition fees as their financial resource, whereas public schools receive their entire funding from the government [62].

The quantity of privately-operated educational institutions currently surpasses 686, catering to an estimated 200,000 enrollees and 12,510 educators [61]. These private schools implement diverse pedagogical programs. In compliance with government regulations, private schools in Qatar are mandated to include the Arabic language, Islamic studies, and Qatari history in their curricula, as stated by the MEHE in 2020. Additionally, Qatari national students who attend private schools are eligible for funding through educational vouchers provided by the government.

With a total population of 3,005,069 [63], of which nationals (Qatari citizens) make up a minority of around 12% compared to a significant number of foreigners (expatriate residents) living and working in the country [64], Qatar manifests an evident imbalance in its demographic composition [65]. An area where the impact of this demographic disproportion is noticeable in Qatar is the education sector, and this accounts for the large number of private schools compared to public schools. Indeed, many expatriate families enroll their children in private schools out of preference or due to necessity, hence the abundance of Arab, Asian, and European/Western private schools. These schools offer curricula similar to those in their home countries and provide modes of instruction in languages other than Arabic, such as English, French, German, Hindi, Urdu, etc. By contrast, Qatari citizens tend to enroll their children in public schools because they are government-funded and easily accessible. These schools are popular among Qataris also because they provide instruction in Arabic and due to the emphasis they place on the values and principles Islam promotes.

Aligned with global efforts, Qatar strives to integrate Sustainable Development (SD) and SDGs into its K-12 curricula. ESD in Qatar involves a range of initiatives, including official top-down efforts, global frameworks, and formal and informal extracurricular school activities. However, there is a need for better alignment between the Qatar Education System's (QES) educational objectives and the SDGs, specifically in establishing clear objectives, implementing effective strategies, monitoring progress, and continuously im-

proving [7,37,60]. Furthermore, there needs to be an effort by policymakers and educators to identify, better understand and address existing challenges that hamper the teaching of sustainability.

5. Research Methods and Design

The present research investigates the viewpoints of both public and private educators regarding the obstacles to imparting education for sustainable development and global citizenship. The instrument used in this study was modified from UNESCO's international survey for teachers [23] (UNESCO, 2021) and customized to suit the local setting considering Qatar's social and cultural sensitivities. Initially, three proficient bilingual professionals translated the survey from English to Arabic. Following this, the survey was piloted with 18 educators, and adjustments were made based on their feedback. These alterations primarily focused on resolving minor translation discrepancies and eliminating redundant questions, reducing the survey's length.

The final questionnaire gathers data regarding teachers' challenges while instructing the diverse aspects of ESD and GCED. The questions pertain to the teachers' perspectives on the challenges they face as they address four themes in the classroom. The questions query specifically about teachers' perceptions about their awareness and readiness related to knowledge and barriers around two ESD themes: (1) climate change and (2) sustainable consumption and production, and two GCED themes: (1) human rights, including gender equality and (2) cultural diversity and tolerance. The following research questions guided the survey design:

1. What teaching and curricular challenges do teachers in public and private schools face when teaching ESD and GCED topics?
2. To what extent do teachers in public and private schools face cultural challenges when teaching ESD and GCED topics?
3. To what extent do teachers in public and private schools face environmental challenges when teaching ESD and GCED topics?

6. Participants and Data Collection

After receiving IRB approvals from Qatar University and Carnegie Mellon University in Qatar (CMU-Q), the MEHE disseminated a link to CMU-Q's Qualtrics platform to all preparatory (i.e., middle) and secondary (i.e., high) school teachers in public and private schools. Teachers were targeted at higher educational levels because they possess more specialized knowledge of interdisciplinary themes, which were thought to align better with the study's objectives. The survey was available in English and Arabic, and participation was voluntary and required approximately 20 min to complete. Data collection took place between November 2022 and March 2023. Researchers initially faced the notable challenge of low participant response rates, particularly among public school educators. To overcome this, supplementary measures characterized by sending follow-up communications to the MEHE were implemented to increase participation and ensure adequate responses from public schools. This second phase of data collection around February ultimately improved the data quality.

Survey respondents included 1094 teachers who taught at preparatory and secondary levels. However, 113 teachers were excluded from the analysis as they did not specify their affiliation with public or private schools. Of the remaining 981 participating teachers, $N = 467$ (180 female teachers) responded from public schools and $N = 514$ (298 female teachers) from private schools. The distribution of preparatory and secondary school teachers was similar between public (48.1% preparatory) and private (52.6% preparatory) schools. Teachers who responded from public schools were more likely to be male ($t(459) = 70.62, p < 0.001$), and teachers from private schools were more likely to be female ($t(506) = 64.54, p < 0.001$). Public school teachers were older on average than private school teachers ($F(1, 965) = 25.70, p < 0.001$), tended to have more years of teaching experience ($F(1, 974) = 39.22, p < 0.001$), and lower overall levels of formal education ($F(1, 974) = 10.54,$

$p = 0.001$). Table 1 describes the demographics of public and private school teachers who participated in the survey.

Table 1. Demographics of public and private school teachers.

		Public		Private	
		N	%	N	%
Gender	Female	180	38.8	298	58.2
	Male	280	60.3	209	40.8
	I prefer not to answer	4	0.9	5	1.0
Age	18–25	7	1.5	13	2.5
	26–30	28	6.0	58	11.3
	31–40	178	38.2	229	44.7
	41–50	162	34.8	159	31.1
	Over 50 years old	85	18.2	48	9.4
	I prefer not to answer	6	1.3	5	1.0
Years of Teaching Experience	Less than one year	11	2.4	11	2.2
	1–5 years	46	9.9	105	20.5
	6–10 years	83	17.8	134	26.2
	11–20 years	208	44.7	192	37.6
	21 years or more	117	25.2	69	13.5
Teaching Level	Preparatory/lower secondary/middle school: Grade 6–8	210	45	250	52.6
	Upper Secondary/High school: Grades 9–12	227	48.6	225	47.4
Main Language of Instruction	Arabic	422	90.8	126	24.7
	English	43	9.2	367	72
	Both Arabic and English			5	1
	Other Language			12	2.4
Teaching Qualification (Teaching Diploma/degree)	Yes	349	75.4	450	88.6
	No	114	24.6	58	11.4
Highest Degree	High School			3	0.6
	College/Associates/Vocational/Diploma	5	1.1	11	2.2
	Bachelors	317	68.2	247	48.3
	Masters	115	24.7	235	46
	Doctorate	28	6.0	15	2.9

Survey questions were classified according to the challenges described above Teaching and Curriculum, Cultural, and Environmental. Data were analyzed using IBM SPSS Statistics (Version 26), and the specific statistical tests used are described in each section below in the results.

7. Results

7.1. Teaching and Curricular Challenges

Perceived teaching challenges: The first research question examined teachers' general challenges in teaching ESD (ESD themes are always: (1) Climate Change; (2) Sustainable

Consumption and Production) and GCED (GCED themes are always: (1) Human Rights, incl. Gender Equality; (2) Cultural Diversity and Tolerance) themes. Only those educators who affirmed teaching any of these four themes were directed to answer the following question: “To what extent is it challenging for you to teach the following topics?”

Response options were given on a 3-point Likert scale (*Not at all, Moderately, Greatly* and included an *I Do Not Teach This* option). Overall, 49.5% to 58.8% of teachers indicated they found it moderately or greatly challenging to teach ESD/GCED themes. Paired *t*-tests compared teachers’ perceived challenges across ESD and GCED themes. Sustainable Consumption and Production ($M = 1.69$, $SD = 0.65$) was reported to be significantly more challenging to teach than Climate Change ($M = 1.61$, $SD = 0.68$; $t_{458} = 3.00$, $p < 0.01$), and Cultural Diversity and Tolerance ($M = 1.62$; $SD = 0.70$; $t_{449} = 2.163$, $p < 0.05$). Human Rights, including Gender Equality ($M = 1.67$; $SD = 0.70$), was also significantly different from Cultural Diversity and Tolerance ($M = 1.62$, $SD = 0.70$; $t_{453} = 2.28$, $p < 0.05$). Taken together, these findings suggest that teachers perceive Sustainable Consumption and Production as the most challenging topics to teach, followed by Human Rights, including Gender Equality, Cultural Diversity, Tolerance, and Climate Change.

Perceived public and private school teaching challenges: To identify if perceived challenges differed between public and private school teachers, one-way analyses of covariance (ANCOVA) were conducted for each theme. Private teachers reported significantly more difficulties perceived than public school teachers for all four themes after controlling for gender, age, and years of teaching experience (results reported in Table 2).

Table 2. One-Way Analysis of Covariance in Teachers’ reported challenges teaching ESD and GCED themes.

	Public		Private		F	η_p^2
	M	SD	M	SD		
Climate Change	1.4	0.5	1.8	0.7	¹ 22.64 ***	0.05
Sustainable Consumption and Production	1.5	0.6	1.8	0.7	² 16.59 ***	0.04
Human Rights, including Gender Equality	1.5	0.6	1.8	0.7	³ 10.14 **	0.02
Cultural Diversity and Tolerance	1.4	0.6	1.8	0.7	⁴ 25.48 ***	0.05

*** $p \leq 0.001$, ** $p \leq 0.01$, M = mean, SD = standard deviation, ¹ F(1,465), ² F(1, 463), ³ F(1, 449), ⁴ F(1,471) Covariates included gender, age, and years of teaching experience.

For certain categories, gender and teaching experience emerged as significant covariates. Females perceived teaching both ESD themes, Climate Change ($F(1,465) = 6.23$, $p < 0.05$, $\eta^2 = 0.01$) and Sustainable Consumption and Production ($F(1,463) = 8.62$; $p < 0.01$, $\eta^2 = 0.02$), as more challenging than males. Those with 1–5 years of teaching experience reported greater challenges than teachers with more experience in Climate Change ($F(1,465) = 4.74$, $p < 0.05$, $\eta^2 = 0.01$), Cultural Diversity, and Tolerance ($F(1,471) = 5.14$, $p < 0.05$, $\eta^2 = 0.01$).

Perceived assessment challenges: Teachers were probed about obstacles related to the curriculum using a set of inquiries to identify challenges in assessing pupils. A 3-point Likert scale (*Not at all, Moderately, Greatly* and Included, and *I Do Not Teach This* option) was employed to explore teachers’ difficulties when assessing students on specific topics.

Approximately 80% of teachers assessed the themes as moderately to greatly challenging. Although perceived assessment challenges were high for all themes, paired *t*-tests comparing teacher responses across ESD and GCED themes revealed some differences. Teachers found Sustainable Consumption and Production ($M = 2.08$, $SD = 0.66$) to be significantly more challenging to assess than Climate Change ($M = 2.02$, $SD = 0.64$; $t_{451} = 2.22$, $p < 0.05$). Similarly, teachers felt Human Rights, including Gender Equality ($M = 2.09$, $SD = 0.66$) was more difficult to assess than Climate Change ($t_{435} = 2.03$, $p < 0.05$). Finally, cultural Diversity and Tolerance ($M = 2.17$, $SD = 0.88$) was more difficult to assess than

Sustainable Consumption and Production ($M = 2.07$, $SD = 0.66$, $t_{459} = 2.47$, $p < 0.05$). Taken together, teachers in Qatar find Cultural Diversity and Tolerance to be the most difficult to assess, followed by Human Rights, including Gender Equality, Sustainable Consumption and Production, and Climate Change.

7.2. Perceived Public and Private Assessment Challenges

ANCOVAs were used to investigate whether assessment challenges differed between public and private school teachers for each ESD and GCED category. The results indicated that private school teachers experience greater challenges in assessing ESD/GCED themes than public school teachers across all four themes while controlling for age, gender, and years of teaching experience (results reported in Table 3). Notably, the differences were particularly significant in the context of Climate Change (ESD), Cultural Diversity, and Tolerance (GCED). Those with 1–5 years of teaching experience reported greater challenges assessing Sustainable Consumption and Production ($F(1, 455) = 5.61$, $p < 0.05$) and Cultural Diversity and Tolerance ($F(1, 457) = 4.92$, $p < 0.05$) than teachers with more experience.

Table 3. One-Way Analysis of Covariance in Teachers' reported challenges *assessing* ESD and GCED themes.

	Public		Private		F	η_p^2
	M	SD	M	SD		
Climate Change	1.9	0.6	2.1	0.6	¹ 13.44 ***	0.03
Sustainable Consumption and Production	2	0.7	2.2	0.6	² 6.27 *	0.01
Human rights, including gender equality	2	0.6	2.2	0.7	³ 6.75 **	0.02
Cultural Diversity and tolerance	1.9	0.6	2.2	0.7	⁴ 19.45 ***	0.04

*** $p \leq 0.001$, ** $p \leq 0.01$, * $p \leq 0.05$, M = mean, SD = standard deviation, ¹ $F(1,459)$, ² $F(1, 455)$, ³ $F(1, 450)$, ⁴ $F(1,457)$ Covariates included gender, age, and years of teaching experience.

Curriculum coverage of the ESD/GCED themes: Teachers were asked to rate whether the formal curricula or curricula guidelines sufficiently covered ESD/GCED themes on a 3-point Likert scale (*Not at all*, *Moderately*, *Greatly*, and included an *I Don't Know* option). Overall, 88% to 92.5% of teachers indicated they found curricula guidelines to moderately or greatly cover ESD/GCED themes.

Paired *t*-tests compared teachers' perceived curricula coverage across all ESD and GCED themes. Teachers believe there is more curriculum coverage for Cultural Diversity and Tolerance ($M = 2.36$, $SD = 0.62$) compared to Climate Change ($M = 2.24$, $SD = 0.58$, $t_{548} = 4.80$, $p < 0.001$) and Human rights, including Gender Equality ($M = 2.24$, $SD = 0.65$, $t_{558} = 6.63$, $p < 0.001$). However, Climate Change ($M = 2.23$, $SD = 0.58$) and Human rights, including Gender Equality ($M = 2.23$, $SD = 0.66$), were each found to be more significantly covered than Sustainable Consumption and Production ($M = 2.19$, $SD = 0.59$, $t_{555} = 2.65$, $p < 0.01$ and $M = 2.18$, $SD = 0.59$, $t_{540} = 2.18$, $p < 0.05$, respectively). Teachers indicated that Cultural Diversity and Tolerance have significantly more coverage than the other themes, and Sustainable Consumption and Production have the least curriculum coverage.

7.3. Perceived Public and Private Curriculum Coverage of the ESD/GCED Themes

ANCOVAs were used to investigate whether curriculum coverage differed between public and private school teachers across ESD and GCED themes. Private school teachers reported Human Rights, including Gender Equality, to have significantly more coverage than public school teachers ($F(1, 563) = 4.527$, $p < 0.05$). No significant differences were found between public and private school teachers for the other three themes.

Access to materials for teaching ESD/GCED: To gain greater insight into the availability of teaching materials for ESD/GCED, teachers were presented with a set of options (see Table 4) and asked: "Please indicate if you have access to materials (e.g., books, online resources,

guidelines) on the following aspects of ESD/GCED.” For each option, teachers could check a box to indicate they had access to materials for the topic from an ESD and/or GCED perspective. Chi-square tests tested whether material access differences existed between public and private school teachers. Public school teachers reported having more materials for the item *suitable pedagogies and didactics to improve students’ understanding of the issue* for both ESD ($X^2(1 N = 381) = 15.10, p < 0.001$) and GCED ($(X^2(1 N = 317) = 12.72, p < 0.001)$). There were no other significant differences.

Table 4. Number and Percentage of teachers having access to ESD or GCED materials. Results reported according to the McNemar Test Analysis.

	ESD		Non-Response		GCED		Non-Response	
	N	%	N	%	N	%	N	%
Reflecting on the issue from a global perspective **	340	34.7	641	65.3	308	31.4	673	68.6
Reflecting on the issue from a local perspective	273	27.8	708	72.2	271	27.6	710	72.4
Suitable pedagogies and didactics to improve students’ understanding of the issue ***	381	38.8	600	61.2	317	32.3	664	67.7
Interdisciplinary and interconnected nature of the issue	203	20.7	778	79.3	218	22.2	763	77.8
Information on how to teach skills that support students understanding of the issue (e.g., critical thinking, creativity, integrity) ***	369	37.6	612	62.4	288	29.4	693	70.6

*** $p \leq 0.001$, ** $p \leq 0.01$.

Table 4 shows the total number of teachers from the entire sample who indicated they had access to materials for ESD (left column) and GCED (right column). Overall, more teachers tend to endorse more access to ESD teaching materials than GCED topics. Additionally, fewer teachers endorsed having materials that help them teach ESD/GCED from an *interdisciplinary and interconnected nature* and fewer materials that *allow them to reflect on the issue from a local perspective*. Interestingly, more teachers report having materials that help them reflect on the issue from a global rather than a *local perspective*. This was supported by a McNemar’s test, which revealed that reflecting on the issue from a global perspective for each of ESD ($\chi^2(df) = 22.81(1), p < 0.001$) and GCED ($\chi^2(df) = 7.16(1), p < 0.01$) was found to be significantly more accessible to teachers than the local perspective.

Further, the McNemar’s test was conducted to examine the association between ESD and GCED. The McNemar’s chi-square test revealed a significant association between ESD and GCED for the following items: reflecting on the issue from a global perspective $\chi^2(df) = 7.63(1), p < 0.01$, suitable pedagogies and didactics to improve students’ understanding of the issue $\chi^2(df) = 26.82(1), p < 0.001$, and information of how to teach skills that support students’ understanding of the issue $\chi^2(df) = 44.76(1), p < 0.001$ (Table 4).

7.4. Teacher Education & Professional Development

Considering whether ESD/GCED themes were incorporated into their initial teacher education, results showed that less than 18% of teachers had undergone training in ESD or GCED. There were no differences in their initial (Initial teacher training refers to the training they underwent before they became teachers.) training between public and private school teachers.

Furthermore, teachers were asked if professional development (PD) was available on the ESD/GCED themes. Between one-third and half of respondents reported they do not

have access to PD to learn how to teach Climate Change (52.3%), Sustainable Consumption and Production (50%), Human Rights, including Gender Equality (41.8%), and Cultural Diversity and Tolerance (36%). Additionally, about 12–13% of the participants were unsure if PD opportunities were available.

7.5. Cultural and Environmental Challenges

While cultural and environmental challenges share some distinct characteristics, they are not mutually exclusive and can intersect under certain circumstances. This is exemplified by the impact of a society's beliefs on sustainability education, as a culture that views sustainability as a contentious issue can greatly shape the environment in which it is taught. Therefore, we include the following questions under a shared category for culture and environmental challenges.

Cultural, Environmental, and Challenges: Participants were presented with statements (see Figure 1) outlining potential challenges. They were asked to indicate their perceptions of ESD and GCED based on their perceived relevance to each statement. Figure 1 depicts similar response patterns for the barriers when assessed according to ESD and GCED themes, where GCED percentages are slightly higher in every case (Figure 1). Chi-square tests of independence were conducted to test for possible differences between public and private school teachers. Public school teachers thought that GCED topics were less relevant for their teaching than private school teachers (see item 11) ($\chi^2(2) = 3.948, p < 0.05$). No other significant differences were found for the challenges reported in Figure 1.

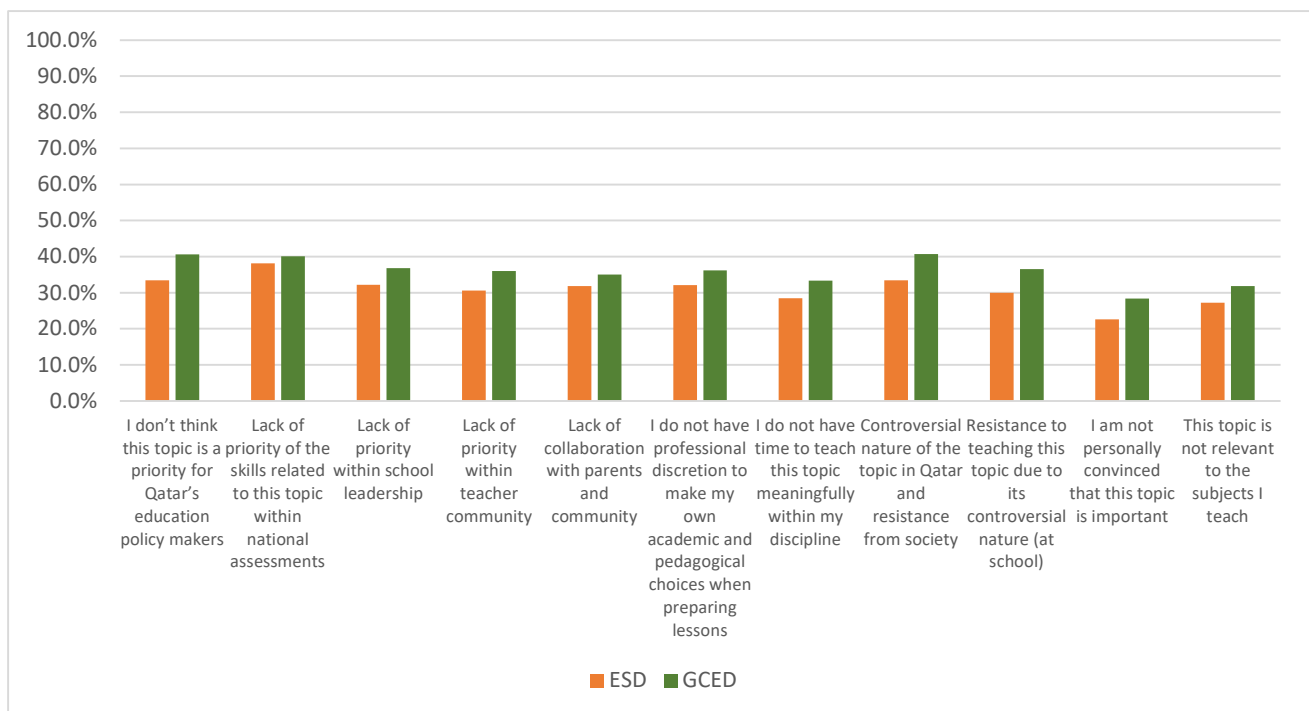


Figure 1. Teachers' responses to factors hinder them from teaching ESD and GCED as overarching categories in percent.

School Practices: Teachers were asked a series of statements about school practices and if they were reflected in their school or not. Response options were *No*, *Yes*, and *I don't know*. Overall, teachers in Qatar frequently reported having access to school facilities and resources to teach ESD and GCED. Specifically, 73.8% of teachers reported having access to *opportunities for sustainable action*; 85% of teachers reported their school *supports activities that promote diverse cultural identities*; 84.3% of teachers reported having *awareness days on various social and environmental issues*, 82.6% of teachers indicated that *students actively engage in volunteering activities*, 78.7% indicated their *school adheres to human rights*

such as non-discrimination, transparency, and accountability; 76.1% confirmed there is a student representative body that influences school policies; 89.9% agreed their school has sufficient and functioning internet and computing infrastructure.

However, the frequency of affirmative responses was lower for two essential school practices. 56.1% of teachers agreed their school provided *finances for school trips and implementing innovative pedagogies*. Additionally, 45.5% of teachers indicated their school has an *action plan on climate change and sustainability*.

General Support: Participants were asked, To what extent, if at all, do you feel supported by your environment to teach the following topics? On a 3-point Likert scale (*Not at all, Moderately, Greatly*, and included an *I Don't Know* option). Overall, regarding ESD and GCED topics, most participants (<90%) reported feeling moderately or greatly supported by their environment to teach ESD and GCED across all themes.

Although perceived school report was high for all teachers, paired *t*-tests comparing teachers' perceived general support by their environment across ESD and GCED themes revealed some differences in perceived support across themes. Teachers feel most supported by their school environment to teach Cultural Diversity and Tolerance ($M = 2.45$, $SD = 0.63$) compared to the other themes: Climate Change ($M = 2.40$, $SD = 0.62$, $t_{544} = 2.40$, $p < 0.01$); Sustainable Consumption and Production ($M = 2.37$, $SD = 0.63$, $t_{547} = 3.39$, $p < 0.001$); Human Rights, including Gender Equality ($M = 2.40$, $SD = 0.653$, $t_{552} = 3.05$, $p < 0.01$). Regarding the perceived public and private teachers' views on general support, ANCOVAs were used to investigate whether perceived support differed between public and private school teachers across ESD and GCED themes. No significant differences were found between public and private school teachers across all four themes. A number of teachers (42.4%) stated that time constraints negatively influenced their ability to teach for sustainability. Public and private school teachers felt equally impacted by time constraints ($X^2(2) \geq 2.163$, $p = 0.141$).

8. Discussion

The analysis and findings of this study are further discussed and presented based on three challenges that guide this study, teaching and curricular, cultural, and environmental. The majority of our research focused on teaching and curricular challenges. Results revealed that more than half of Qatar's teachers faced moderate to significant challenges when teaching ESD and/or GCED themes, which is consistent with UNESCO's 2021 report that assessed teacher preparedness in 144 countries through its Global Survey for Teachers on Education for Sustainable Development and Global Citizenship Education (SDG 4.7). UNESCO found that half of the respondents encountered difficulties teaching the four ESD and GCED themes. The fact that both reports show similar findings is noteworthy and suggests that this finding might be generalizable across all cultures and among teachers in different educational settings. In Qatar, 95% of teachers are non-Qataris from various parts of the world, with a majority hailing from other Arabic-speaking countries in the Middle East [66]. Furthermore, previous research examining the challenges of teaching ESD and/or GCED themes in Qatar supports this finding [5,66,67].

Perceived barriers differed between themes: teachers reported Cultural Diversity and Tolerance to have the greatest curriculum coverage, more available PD opportunities, and the most perceived support by their environment to teach compared to the other themes. In comparison, Sustainable Consumption and Production were reported to have the least coverage and were the most challenging of the themes to teach, with fewer PD opportunities. These results highlight the need to offer adequate support for teachers across all themes and demonstrate how specific ESD/GCED themes may receive less attention than others, which results in significant teacher challenges. Future research might examine the role that an established climate change and sustainable action plan within a school might support teachers in this regard, as in the present study, less than half of teachers indicated their school had such a plan.

Interestingly, although all themes were consistently reported to be difficult to assess, teachers felt Cultural Diversity and Tolerance were the most difficult to assess. This might be due to the enhanced focus on this theme, which might make teachers more aware of the difficulty of ESD and GCED activities. The results indicate that teachers working in private schools in Qatar perceive greater difficulty in teaching this cultural diversity and tolerance, implying that the cultural environment influences their perception.

Our findings in this study, that teachers find assessment challenging generally, is consistent with UNESCO's [23] survey that teachers in other countries reported that assessing students' learning outcomes in ESD and GCED topics were generally more challenging than delivering the topics. UNESCO findings revealed that teachers encountered obstacles in evaluating students' adherence to ESD and GCED principles. In Qatar, Al-Kuwari et al. [7] found that teachers faced difficulties and barriers regarding the present assessment practices and their adequacy in measuring sustainability competencies. The teachers identified several issues with the existing assessment practices, including a limited scope, concentrating solely on knowledge acquisition, and neglecting other dimensions such as skills, values, and purpose. Furthermore, the teachers noted a need for appropriate tools and misalignment with teaching and learning activities and the Education Goals (EGs), Qatar National Vision (QNV), and SDGs.

The above raises the underlying issue if teachers are ready to teach the SDGs. There is a consensus that teacher education holds significant implications for attaining the SDG 4 objectives [32]. Among the UNESCO survey of 58,000 teachers, nearly 70% reported learning about GCED themes in their initial teacher education or subsequent professional learning. However, this percentage drops to almost 50–55% for ESD themes. This pattern was similarly observed in the present study, where more teachers reported access to PD for GCED (~70%) compared to ESD themes (~52–62%).

In contrast, only 18% of Qatar's teachers reported having received any training on ESD and GCED themes. No discernible differences were evident between teachers employed in public schools versus those employed in private schools. Within ESD, approximately 38% of teachers have access to PD opportunities covering climate change, while 39% have access to PD opportunities covering sustainable consumption and production. Within the realm of GCED, the study revealed that 48% of teachers have access to PD opportunities covering Human Rights, including Gender Equality. In comparison, 53% have access to PD opportunities covering Cultural Diversity and Tolerance. The disparity between ESD and GCED PD opportunities in the present study mirrors the results of UNESCO's study, which ultimately suggests that offering more PD resources to GCED themes than ESD themes might be a global trend.

The UNESCO report titled "Progress in Education for Sustainable Development and Global Citizenship" [68] emphasizes enhancing teacher training. In Qatar, Chaaban et al. show that teacher education programs incorporate various top-down frameworks addressing ESD implementation [69]. The study examines the development and assessment of a framework encompassing the fundamental skills and knowledge aspiring teachers in Qatar must possess to implement ESD effectively. This research compared various stakeholders' viewpoints and findings, demonstrating the difficulties inherent in reaching a consensus on the competencies needed for pre-service teachers to implement ESD. The emergence of different perspectives has been influenced by varying beliefs regarding the responsibility for the design and definition of competencies. Chaaban et al. argue it is vital to incorporate principles of ESD into the curriculum effectively, and all parties involved in education must come to a consensus on the integration process. This would include determining the role of teachers in designing lessons and units, which would then transform the curriculum documents into tangible practices for students [69]. Nevertheless, the authors contend that a consistent method is necessary to equip aspiring teachers with the requisite skills and knowledge to achieve ESD effectively.

This approach can also contribute to equipping schools with action plans concerning climate change and sustainability, an area where only 45.5% of teachers confirmed having

such plans in their respective schools, as revealed by the survey. The persistent challenge of sustainable consumption and production, highlighted consistently in this study and echoed in the UNESCO study, calls for a systemic implementation approach to address it effectively.

Concerning readiness, around half of the survey participants indicated that they need access to instructional support regarding sustainability education. At the same time, roughly 12–13% of respondents expressed uncertainty regarding professional development opportunities in this field. Koc and Fadlelmula's [66] research provided corroboration for the current finding, as they noted an absence of PD opportunities and observed that existing PD strategies lack clear objectives, coherent structure, and demonstrable advancement. In addition, the PD provided by the MEHE lacks a cohesive framework consistent with the principles of ESD and GCED [37].

This study found that the proportion of teachers without instruction in sustainability remained consistently between 36–50% across all four themes. In addition, it revealed that teachers report greater access to teaching materials in ESD than in GCED. Public school teachers, in particular, are more prone to report an absence of coverage in their curriculum topics for the human rights and gender equality dimension. Public school teachers also report GCED topics as less relevant for their teaching than private school teachers.

Teachers face significant environmental challenges that have notable consequences. According to a report by UNESCO (2021), approximately 60–70% of respondents felt moderately or greatly supported in teaching themes related to Education for Sustainable Development (ESD) and Global Citizenship Education (GCED). However, the present study reveals that over 90% of teachers in Qatar feel moderately or greatly supported. Despite this positive trend, when examining the types of environmental, cultural, and financial barriers identified by UNESCO, a pattern emerges where a higher percentage of barriers pertain to ESD topics than GCED (excluding resistance to teaching due to its controversial nature). In contrast, Qatar experiences slightly higher barriers to GCED than ESD in every case (Figure 1). Notably, less than 25% of teachers in the UNESCO case reported the topic's controversial nature, making it the least selected barrier. However, the present study constituted the most selected barrier at around 40%, followed by "I don't think this topic is a priority for Qatar's policymakers" and "lack of priority within national assessments" for the GCED theme. The higher barrier for GCED, possibly due to its controversial nature, may explain why private school teachers in Qatar report relatively greater coverage of Human Rights, including Gender Equality themes, in their curricula compared to public school teachers. Furthermore, the perception of public school teachers that GCED topics are less relevant to their teaching reinforces the finding of a lack of curricular coverage given the top-down approach to curriculum development by the MEHE in public schools.

Bruder et al. [70] demonstrate a substantial disparity in the preparedness of public and private school educators to meet the objective of SDG 4.7. Educators in Qatar's private schools generally demonstrated greater congruence, proficiency, and involvement in ESD and GCED instruction than their public school counterparts. This highlights the necessity of evaluating the readiness levels of public school educators and identifying areas of improvement based on their preparedness, alignment, skills, and participation.

Our research also provides evidence that gender can impact the perceived difficulty of teaching climate change and sustainable consumption and production, with female teachers reporting greater challenges than male teachers. This seemingly conflicts with the report by UNESCO [23] stating that female teachers are more likely to teach topics related to ESD and GCED and encounter fewer difficulties than male teachers. It further indicated that more female teachers reported facing no or minimal challenges (35–40%) than their male counterparts (one-third). However, it is crucial to acknowledge that various factors can affect teachers and their instructional strategies. Some factors include personal characteristics, beliefs, attitudes, self-efficacy, organizational culture, facilities, and resources [67,71]. The gender-based differences in sustainable behaviors and attitudes might be attributed to the significant influence of gender on sustainability-related characteristics [72,73].

Finally, it is an anomaly that although public school teachers report less readiness to teach ESD and GCED than private school teachers [70], they perceived fewer challenges than private school teachers in teaching and assessment. This is a complicated finding that warrants some discussion and inference. First, the concepts of readiness and challenges are relative terms that public and private school teachers might interpret differently based on their experiences or depending on the criteria of the school's curricula. Possibly supporting this theme is the finding that more public school teachers perceived GCED topics as less relevant to their teaching than private school teachers. For example, if a teacher in a private school is required to integrate the sustainability themes within their discipline and conduct comprehensive assessments, while a public school teacher might be necessary to introduce the themes with a less rigorous assessment process, the teachers' perspectives would differ. Sever and Tok [60] agree that various school types result in diverse ESD implementation approaches and degrees. This variation in dedication, funding, and involvement with ESD among different schools creates obstacles in incorporating ESD into the formal education system and could account for these teachers' perspectives.

9. Conclusions

The survey findings yield a dual perspective. First, the results highlight the different challenges that can surface within the realm of ESD and GCED. By focusing on four central themes and acknowledging the range of perceived challenges to teaching them, a more comprehensive understanding of ESD/GCED education emerges, facilitating greater customization for country and school needs. Second, they highlight the disparity between teachers in public and private educational institutions. This provides a cautionary reminder to avoid overinflating the perceived challenges teachers face by considering the educational context.

The current study demonstrates that many teachers, regardless of whether they work in public or private schools, encountered challenges when teaching topics related to ESD or GCED. This was also evident in assessment practices, where teachers faced significant challenges across all four themes. Furthermore, the study findings indicate that teachers' experiences in public versus private schools differed concerning these types of instruction. To address these challenges and improve ESD and GCED instruction, it is necessary to conduct further research to identify the underlying factors responsible for these discrepancies. This information can then be utilized to develop more effective teacher education programs for pre-service teachers and professional development opportunities for in-service teachers.

As previously stated, a lack of professional development opportunities persists, and those that are available need to adequately address the specific requirements of educators. Consequently, a well-defined and comprehensive framework is imperative [66]. This is evident in the many responses of teachers in this study. Furthermore, integrating ESD and GCED into teacher education is essential due to education professionals' significant impact on transforming schools and society [70]. It is crucial to regularly evaluate these programs to ensure that students have ample opportunities to learn and apply ESD/GCED concepts in their daily lives and thinking, as they are the future generation [22]. Integrating ESD and GCED into teacher education is imperative because education professionals significantly impact transforming schools and society.

Addressing the environmental challenges faced by teachers requires a multi-faceted approach. National priorities must be strengthened to prioritize professional development (PD) and assessment practices regarding ESD and GCED themes. By placing a greater emphasis on supporting teachers through well-defined policies and priorities, an improvement in assessment practices through educational stakeholders' support will likely result. This will improve teacher readiness to integrate ESD and GCED themes into their teaching effectively.

Additionally, greater support for teachers in delivering what may be deemed culturally sensitive information is paramount. These issues often pose challenges to teaching whereby teachers are not confident to discuss ESD and GCED themes. Thus, it is essential to equip

teachers with the necessary tools and resources to navigate these topics while promoting cultural competence and emphasizing the understanding of local challenges.

It is crucial to regularly evaluate these programs to ensure that students have ample opportunities to learn and apply ESD/GCED concepts in their daily lives and thinking, as they are the future generation [22].

10. Limitations of This Study and Future Research

This research had multiple constraints. First, it was a preliminary investigation that solely examined the teachers' perceptions of challenges in teaching ESD and GCED in both public and private schools in Qatar. The study design was exploratory, and the findings offer some insight into teacher barriers to teaching ESD and GCED, but more research is needed to draw substantial conclusions. The present study should be seen as an invitation to researchers to dive deeper into emerging barriers that seem to be of interest both generally and locally. The participants' perceptions in this research offer a limited portrayal of a complete narrative. In many instances, the responses obtained from the survey were constrained by response format, for example, simple "yes" or "no" formats, which did not allow teachers to provide any supporting examples. As a result, further qualitative research is necessary to gather specific information concerning teaching ESD/GCED themes. Qualitative studies based on these findings would provide valuable insights into teachers' rationales for not teaching ESD/GCED themes, additional challenges they encounter, and their perspectives on ESD/GCED themes. Additionally, it is crucial to acknowledge that the teachers who participated in the survey may have a stronger inclination towards valuing SDG themes. Therefore, this survey may only be representative of some teachers in Qatar.

This research presents an opportunity for further academic exploration of the obstacles faced by educators when teaching sustainability in Qatar. Specifically, a qualitative investigation into the challenges of teaching ESD and GSE would be beneficial. Extensive research in teacher education in Qatar and its role in developing future teachers ready and equipped to teach ESD and GSE is vital. Finally, valuable research could be conducted on the topics discussed in this study, such as cultural considerations surrounding sustainability, particularly the disparity between lifestyle and the necessity for behavioral change.

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