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Abstract

University students are the future leaders of a country. Their knowledge about such global problems is essential for getting involved and taking preventive actions. The primary objective of this research was to evaluate university students' knowledge, attitudes, and practices regarding climate change. The study employed a cross-sectional design among 768 students from two private-sector universities in Kabul city. The data were collected from March to May 2024, and all enrolled students participated in this research. The results indicated that the majority of students (82.6%) had knowledge about climate change and its causes, which negatively affected their lives, and 57.8% had good knowledge about climate change. As a result, climate change education is highly significant at the university level, as most students have inadequate preventive practices.

Keywords: *Climate Change, University Students, Kabul, Knowledge, Attitude, Practices*

1. Introduction

The concept of climate change is a topic of interest for scholars and a current phenomenon among social sciences researchers (Nasrati, 2018). Concern about climate change is increasing rapidly globally (Ramasamy & Surendren, 2012; Watts et al., 2018; Haines & Ebi, 2019; Broto & Bulkeley, 2013; Benevolenza & DeRigne, 2018). The United Nations Framework Convention on Climate Change (UNFCCC, 2008; Abdi, 2018) defines climate change as "a shift in the climate and evolution in the atmosphere's composition due to human activity". Climate change is the result of human economic activities, specifically after the Industrial Revolution, and natural disasters, which have caused an increase in the emission of greenhouse gases into the atmosphere (Kazemi, 2022; IPCC, 2019).

As climate change concerns continue in recent decades, the world's temperature increases and rainfall dramatically decreases, which adversely affects environmental suitability and the survival of human beings (Pachauri et al., 2014; Elsharkawy et al., 2023; UNESCO Bangkok, 2012). No country has remained unaffected by climate change, whether developed, developing, or underdeveloped (Bhatt et al., 2013; WHO, 2020). Furthermore, climate literacy rates vary from country to country, and many studies have indicated that low-income countries exhibit lower literacy levels compared to wealthy nations (Lee et al., 2015; Carbon Brief, 2015). Undoubtedly, in Central Asia, climate change has been neglected, and very few research articles (0.24%) were published on climate change from

1991 to 2021 (Vakulchuk et al., 2023). However, a developing country like Afghanistan is one of the countries in Central Asia that has suffered a lot from the damages of climate change in recent years (Nasrati, 2018; IPCC, 2019; COP28; INFORM Risk Index, 2023) and a subject of research for many researchers and scholars for its causes, challenges, factors and weak adaptation policies of climate change in Afghanistan (Zaki, 2023). Afghanistan is vulnerable to climate change due to its weak economy to provide funds without the international community (Zaki, 2023) and ranked fourth in the list of countries at high risk of climate change (INFORM Risk Index, 2023; IPCC, 2019) and eight on the Notre Dame Global Adaptation Index (OCHA, 2023). KAP study is significant in bringing useful insights about climate change awareness among youth because university students are future leaders, and their engagement in climate change action is important, as UNDP (2023) reported, "Afghanistan is on the brink of climate catastrophe; we must act now". Higher educational institutions have a low capacity to teach students on CC and are only involved in climate-related issues for future careers (Filho et al., 2023), but little is known about their beliefs, knowledge, and attitudes towards climate change (Watts et al., 2018).

Currently, there are few studies on climate change in primary school curricula and textbooks (Kazemi, 2022). However, most studies have focused on the causes, impacts, and challenges of climate change in Afghanistan (Rasouli, 2022). Only limited studies have been conducted on climate change awareness among medical university students (Joya et al., 2024; Sherzad et al., 2024; Latifee et al., 2024).

As a result, few researches were found on climate change literacy at university level in Afghanistan (AhbiRami & Zuhara, 2020) especially in Kabul city no single study was conducted on climate change awareness at university level which is a highly populated and affected city from climate change which shows a clear research gap in the literature. This study makes a significant contribution to drawing attention to the lack of research on climate change literacy levels in higher education institutions in Afghanistan. This study utilises Social Learning Theory (SLT), which posits that individuals learn behaviours and attitudes through observation and interaction within their social environment. This framework is particularly pertinent in understanding how university students in Kabul may acquire knowledge and develop attitudes toward climate change. "As noted by Folke (2003), social learning involves interactions among individuals or communities, which can significantly influence behaviours related to climate change. Hence, this research aims to investigate the level of university students' knowledge, attitudes, and practices toward climate change in private higher educational institutions in Kabul, Afghanistan.

2. Review of Literature

The previous studies agreed that climate change concerns are increasing rapidly around the globe which had adverse effects on human life commonly like severe droughts, floods, high temperature, water shortages and agriculture are clear examples of catastrophes change of climate change (Salman et al., 2023; Jayatilleke & Yiyong, 2014; Longlois, 2019; UNESCO, 2013) and caused negatively on nature and ecosystem around the world (IPCC, 2014; Islam et al., 2016; FAO, 2014). According to a UNICEF (2021) report, low-income countries suffer more adversely from climate change compared to developed countries (Fankhauser & McDermott, 2014). Similarly, countries with unfavourable economic conditions and weak governance capacity to prevent climate change impacts are badly affected (Marí-Dell'Olmo, 2022; Saad-Hussein, 2019).

Even though there is a very low-level literacy in low-income countries about climate change, therefore, climate change literacy is significant for numerous reasons to start climate change education in schools and at the university level to understand climate change problems, decrease their climate effects, and undertake adaptive behaviors especially in young generations (UNESCO, 2010; UNCA, 2013; Kolenatý et al., 2022).

Pakistan is the 16th most vulnerable country to climate change (Khan et al., 2016). Similarly, Gulf countries established a youth council for climate change in 2021 to empower the young generation's engagement in addressing climate change causes, challenges, and finding effective solutions to this issue (Arab Youth Centre, 2021). Another study was conducted in Bahrain to engage youth in climate change awareness programs. Fifty university students from various universities were invited to participate in climate change championship events to find innovative ideas and solutions (Hosta, 2022). A study was conducted to impart knowledge about a positive attitude toward climate change problems among university students (Kumar, 2017). Furthermore, a KAP study conducted in 14 communities in Japan assessed the region's knowledge, attitudes, and practices regarding climate change issues, indicating that most people (93%) were familiar with climate change. However, some lacked extensive knowledge about the negative impacts of climate change (Saint Vincent and the Grenadines, 2017).

A study conducted by Hussain et al. (2019) indicated that low adaptation and mitigation awareness among people caused extreme climate damages in Pakistan and suggested that the government should take essential steps toward sustainable development, with resource accountability and effective climate change policy regulations. Similarly, another study has shown that climate change creates complex challenges to achieving a country's sustainable development (Filho et al., 2023).

2.1 Climate Change in Afghanistan

Afghanistan is a landlocked country located in Central Asia, with a diverse geography that is covered by 63% mountains (Achi et al., 2017). The high destruction resulting from recent events, such as severe droughts, floods, high temperatures, water shortages, and poor health conditions, is a direct consequence of climate change in Afghanistan (Baizayee et al., 2014; LDCF & UNEP, 2015; Qutbudin et al., 2019; Pervez et al., 2014). Similarly, Afghanistan is categorized among the most vulnerable to climate change in Central Asia due to its low adaptive capacity, four decades long-war, weak infrastructure, high illiteracy, high poverty, unemployment rate, weak financial position, lack of physical resources, high dependency on agriculture and forming (Kreft et al., 2015; Maplecroft, 2011; UNEP, 2003; Central Statistical Office, 2016) and no recognition of the current government from the international community to access officially to UNFCCC, UN, UNPF and UNESCO meetings and other relevant international organizations to receive financial support for climate change mitigation in Afghanistan (Spink, 2020; Adil et al., 2020).

Climate change concerns are arising among Central Asian states, specifically for Afghanistan, which seems a more dangerous and serious challenge because of recent floods, high temperatures, and low agricultural productivity with water shortages (Swinnen et al, 2017; Mitchell et al., 2017; Conrad et al., 2013; Shiferaw et al., 2013; Teixeira et al., 2013). According to the Climate Change and Crisis Risk report (INFORM, 2023), it is significantly affected by climate change. The high-risk categorisation reflects the urgent

need for international support and adaptive measures to mitigate the impacts of climate change on the Afghan population and its ecosystems.

3. Methodology

3.1 Research Design

In this research, a cross-sectional research method was applied from March to May 2024 at two private universities in Kabul city. All enrolled students were considered participants in this study. The sample size was calculated with a 95% confidence level, a 5% alpha level, and an assumption of a 50% knowledge level of university students (participants). Therefore, the minimum required sample size was 384. We doubled the sample size, and finally, 768 students participated in the study, with a response rate of 92%. The data was collected between March and May 2024. Proportional allocation was employed to determine the number of students from each university. Afterwards, students from different years were chosen using a cluster random sampling technique.

The questionnaire was adopted from Elsharkawy and Refaat (2024) and translated into the official languages of Afghanistan (Pashto and Dari), comprising five sections. The first section pertained to the socio-demographic information of the respondents. The second section comprises awareness about climate change. In the third section, the students were categorised into two further sections (Poor Knowledge) and (Good Knowledge). The fourth section was to assess students' awareness about climate change and their perceived solutions. The fifth section was about students' attitudes toward climate change and their perceived solutions.

Statistical analysis was conducted using SPSS. Quantitative variables were analysed with means and standard deviations. To compare means of knowledge scores among demographic groups, independent t-tests and one-way ANOVA were used. Categorical variables were summarised as frequencies and percentages, and relationships between these variables were assessed using the chi-square test. The significance level was set at $p < 0.05$ for all analyses. This methodological framework ensured a comprehensive evaluation of students' knowledge, attitudes, and practices regarding climate change.

4. Data Analysis

Table 2

Demographic Characteristics of the Respondents

Items	Frequency (Percentage) N=768
Age in years: ≤ 20	482 (62.8)
>20	"286 (37.2)"
University	
Salam	"328 (42.7)"
Jahan	"440 (57.3)"
Year	
1st	"227 (29.6)"
2nd	"163 (21.2)"
3rd	"220 (28.6)"
4th	"158 (20.6)"
Residence	
Urban	"373 (48.6)"

Rural	"395 (51.4)"
Socio-economic status	
Low	"238 (31.0)"
Middle	"438 (57.0)"
High	"92 (12.0)"

In Table 2 above, a total of 768 students participated in this study. The mean age of the participants was 62.8%. This indicates that most of the students were young and came from rural areas (51.4%), and 57% belonged to the middle social class. Regarding universities, 42.7% of the students were from Salam, and 57.3% were from Jahan University.

Table 3: University students' Awareness about Climate Change

Items	**Frequency (Percentage) N=768**	
	Yes	**No**
Have you heard the term climate change?	634 (82.6)	134 (17.4)
Do you think that climate change affects your community?	632 (82.3)	136 (17.7)
Do you know the United Nations Sustainable Development Goals for climate action?	85 (11.1)	683 (88.9)
Do you know what actions the current government is taking to reduce climate change?	171 (22.3)	597 (77.7)

Table 3 indicates that most students (82.6%) have heard about and are aware of climate change, and they believe it has a negative impact on their community (82.3%). However, only 11.1% were aware of the United Nations Sustainable Development Goals for climate action, and only about one-fifth (22.3%) were aware of the current government's actions to mitigate climate change.

Table 4

Respondents' Attitudes toward Climate Change and Their Perceived Solutions

Items	Frequency (Percentage) N= 768		
	Agree	**Uncertain**	**Disagree**
Climate change is a serious problem	378 (49.2)	27 (3.5)	363 (47.3)
Climate change can reduce the quality of life for future generations	530 (69.0)	216 (28.1)	22 (2.9)
How much do you agree with the following statement about coping with climate change?			
Use renewable energy sources (Solar)	736 (95.8)	12 (1.6)	20 (2.6)
Decrease industrial pollution	736 (95.8)	21 (2.7)	11 (1.4)
Dispose of waste properly	722 (94.0)	18 (2.3)	28 (3.6)
Encourage community participation	710 (92.4)	30 (3.9)	28 (3.6)

Enact legislation with the enforcement of laws	702 (91.4)	33 (4.3)	33 (4.3)
Make international agreements	676 (88.0)	32 (4.2)	60 (7.8)
Increase tree planting	664 (86.5)	30 (3.9)	74 (9.6)
Use environmentally friendly technologies	658 (85.7)	60 (7.8)	50 (6.5)
Increase public awareness about climate change	657 (85.5)	39 (5.1)	72 (9.4)
Encourage water conservation and reuse	531 (69.1)	146 (19.0)	91(11.8)
Discourage the construction of new buildings in vulnerable areas	272 (35.4)	99 (12.9)	397 (51.7)

Table 4 highlights respondents' attitudes toward climate change and their perceived solutions to the issue. Nearly half (49.2%) agree that climate change is a serious problem, while 69.0% believe it will reduce the quality of life for future generations. A strong majority support solutions such as using renewable energy sources (95.8%), decreasing industrial pollution (95.8%), and proper waste disposal (94.0%). Other solutions, such as encouraging community participation (92.4%), enacting legislation (91.4%), making international agreements (88.0%), and increasing tree planting (86.5%), also receive high support. However, while 69.1% back water conservation, a notable percentage (19.0%) is uncertain. The least agreement is found regarding discouraging construction in vulnerable areas, with only 35.4% in favour and 51.7% disagreeing, indicating a potential area for further education and engagement.

Table 5

Personal Characteristics of Students regarding Knowledge of Climate Change

Variable	**Knowledge** N=768		**P-value**
	Poor (n=308) n (%)	Good (n=460) n (%)	
Age in Years			
≤20	202 (65.6)	280 (60.9)	0.2
>20	106 (34.4)	180 (39.1)	
Residence			
Rural	211 (68.5)	184 (40.0)	0.000*
Urban	97 (31.5)	276 (60.0)	
Socio-economic status			
Low	109 (35.4)	129 (28.0)	0.07
Middle	168 (54.5)	270 (58.7)	
High	31 (10.1)	61 (13.3)	
Source of information			
Electronic Media	137 (44.5)	236 (51.8)	
Educational Sources	74 (24.0)	151 (32.8)	
TV and Radio	97 (31.5)	73 (15.9)	

*Statistically significant difference ($p < 0.05$)

Table 5 indicates that there is no statistically significant difference in climate change knowledge between younger students (≤ 20 years) and older students (> 20 years). The

p-value of 0.2 indicates that age does not significantly influence the knowledge levels of the students. On the other hand, there is a significant difference in knowledge based on residence, with rural students showing poorer knowledge (68.5% poor) compared to urban students (31.5% poor). The very low p-value (0.000) indicates a strong statistical significance, suggesting that living in an urban area is associated with better knowledge of climate change. While there is some variation in knowledge levels across socio-economic statuses, the differences are not statistically significant (p-value of 0.07). This suggests that socio-economic status may have some effect on knowledge.

A larger percentage of students with good knowledge (51.8%) obtained their information from electronic media compared to those with poor knowledge (44.5%). This suggests that electronic media are a relatively effective source for enhancing knowledge about climate change. The percentage of students with good knowledge (32.8%) is higher than that of those with poor knowledge (24.0%), indicating that educational sources also contribute positively to the knowledge levels of university students about climate change.

Table 6

Relationship between Knowledge & Practices of Students regarding Climate Change

Practices	**Total** N=768/ N (%)	**Knowledge**		**P-value**
		Poor (n=308) n (%)	Good (n=460) n (%)	
Have you taken any specific actions to protect the environment?	305 (39.7)	66 (21.4)	239 (52.0)	0.000*
Use energy-efficient lightbulbs	685 (89.2)	261 (84.7)	424 (92.2)	0.001*
Walk short distances rather than riding	502 (65.4)	187 (60.7)	315 (68.5)	0.03*
Use public transportation instead of a private car	498 (64.8)	183 (59.4)	315 (68.5)	0.01*
Limit the use of air conditioning in summer	425 (55.3)	181 (58.8)	244 (53.0)	0.1
Participation in tree plantation drives	305 (39.7)	100 (32.5)	205 (44.6)	0.001*
Turn off lights and devices when not needed	273 (35.5)	114 (37.0)	159 (34.6)	0.5
Pay attention to water consumption	270 (35.2)	85 (27.6)	185 (40.2)	0.000*
Reduce the use of plastic items	246 (32.0)	80 (26.0)	166 (36.1)	0.003*
Use recyclable products	228 (29.7)	73 (23.7)	155 (33.7)	0.003*
Dispose of waste properly	222 (28.9)	68 (22.1)	154 (33.5)	0.001*
Use paper bags instead of plastic ones	183 (23.8)	62 (20.1)	121 (26.3)	0.05
Use the stairs instead of the elevators	175 (22.8)	62 (20.1)	113 (24.6)	0.1
Consume organic food	92 (12.0)	34 (11.0)	58 (12.6)	0.5

*Statistically significant difference ($p < 0.05$)

Table 6 presents the relationship between students' knowledge and practices regarding climate change, highlighting various environmental practices among 768 respondents. A statistically significant proportion of participants who have undertaken specific activities to protect the environment report good knowledge (52.0%) compared to those with poor knowledge (21.4%), with a p-value of 0.000. Similarly, using energy-efficient light bulbs shows a strong association with good knowledge (92.2% vs. 84.7%, p = 0.001). Other practices, such as walking short distances (68.5%) and participating in tree plantation drives (44.6%), also correlate positively with good knowledge, as reflected by p-values of 0.03, 0.01, and 0.001, respectively. Conversely, practices like limiting air conditioning use and consuming organic food do not show significant differences in knowledge levels (p-values of 0.1 and 0.5). Overall, the table indicates that the engagement in environmentally friendly practices is associated with higher knowledge of climate change among university students.

5. Conclusion

The primary objective of the study was to evaluate university students' knowledge, attitudes, and practices regarding climate change in private sector universities in Kabul, Afghanistan. This research indicates that most university students (57.8%) had knowledge about climate change and were aware of its causes, which have adversely affected their community over the last decade in Afghanistan. However, most students from rural areas had limited knowledge about climate change adaptation. Additionally, a larger proportion of students with good knowledge (51.8%) obtained their information from electronic media compared to those with poor knowledge (44.5%). A large number of students gained information (51.8%) about climate change from electronic media which indicates that electronic media is a relatively effective source for enhancing knowledge about climate change and lower percentage (24%) for educational sources suggests a potential area for improvement in how educational institutions disseminate information about this critical issue.

5.1 Recommendations and Future Research

Incorporating Social Learning Theory into educational strategies can enhance this process by emphasising the role of social interactions and collaborative learning in the acquisition of knowledge. By leveraging electronic media and fostering peer-to-peer learning environments, educational institutions can create platforms that not only disseminate information but also engage students in meaningful discussions about climate change. This approach can lead to a more informed and engaged student body, ultimately resulting in improved practices in climate change adaptation and mitigation. Such strategies can empower students to become active participants in addressing climate challenges, fostering a culture of sustainability and resilience within their communities. Future research should consider longitudinal studies to track changes in knowledge and attitudes, as well as comparative studies between public and private universities to identify specific needs.

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