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Perceptions of Climate Change's Impacts on Implementation of Mitigation Actions among Students of Thuongmai University, Vietnam

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ABSTRACT

Background: Climate change is one of the most pressing issues of our time, with far-reaching consequences for the environment, economies, and human societies. Vietnam, a country in South-East Asia, is particularly vulnerable to climate change impacts, including rising sea levels, increased frequency of extreme weather events, and changes in temperature and precipitation patterns, presenting a growing need for climate change mitigation and adaptation efforts, particularly among young people who will bear the brunt of climate change impacts. Thuongmai University, Vietnam, is a key institution for higher education and research, with a large student population that could play crucial role in shaping the country's response to climate change. However, little is known about how students at Thuongmai University perceive the impacts of climate change and their role in mitigation efforts.
Objective: This study assessed the perceptions of students at Thuongmai University in Vietnam regarding climate change. Specifically, the research examined their views on the socio-economic and environmental impacts of climate change, as well as their personal mitigation behaviors.
Method: A survey via questionnaire design was employed, 350 students responded. Techniques, such as descriptive statistics, composite reliability, exploring factor analysis, and multiple linear regression, were adopted for data analysis.
Results: The research results show that most students are familiar with and have a clear awareness of this issue. Students' perception of the causes of climate change, the impacts of climate change on the economy, society, people, and nature, all have positive impact on climate change mitigation activities.
Conclusion: Students' perceptions of climate change at Thuongmai University in Vietnam is quite adequate, including its impacts on nature, socio-economics, people, and its connection with readiness to take mitigation actions.
Unique Contribution: The article proposes research implications to help universities better equip students with knowledge about climate change and help them shape and adapt to actions to mitigate the impacts of climate change in the future.
Key Recommendation: Higher education institutions need to strengthen communication forms, make the most of social media channels to raise students' awareness of climate change, the impacts of climate change, and mitigation actions.

Keywords: climate change, mitigation activities, student's perception, university

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INTRODUCTION

The Earth, its people and its natural resources are facing increasingly severe, frequent and increasingly negative impacts. The current challenges and new climate realities are becoming more familiar to any country or organisation around the world. Most scientists believe and agree that the international community must work together to ensure that the average global temperature does not rise more than 1.5 degrees Celsius above 1990 levels (Masson-Delmotte et al., 2018). This requires the international community to take more drastic and stronger actions on two key aspects: mitigation and adaptation (Molthan-Hill et al., 2019). Accordingly, implementing measures to increase awareness of climate change and contribute to adjusting human behavior early on will be an effective and sustainable approach (Nsude & Nwafor, 2016). In addition, UNESCO (2017) called for, at the Paris Agreement, the creation of new academic programs across a diverse range of disciplines to ensure that future educated individuals have a better understanding of both the harmful impacts of climate change and adaptable tools that can help mitigate its consequences.

Although climate change education is crucial at all levels, from primary school to university, the higher education sector has the greatest need to develop a systematic approach (Leal Filho et al., 2018). Thereby educational institutions can raise awareness and shape the behaviour of future educated citizens regarding climate change and climate change mitigation actions. However, studies related to climate change awareness in universities still show certain different results. Haq and Ahmed (2020) refer to A national study conducted by Asia Foundation in 2012 which showed that only one-third of respondents were aware that climate change is caused by human activities while nearly half of them believed that the responsibility lies with nature or God. Similarly, Hasan and Nursey-Bray (2018) stated that approximately 60% of respondents attributed climate change to an act of God, while only 26% of people understood that deforestation is the main cause of climate change. However, Ofori et al. (2023) reveal that the top two best perceptions about climate change exhibited by students in Ghana were about climate change being real (97.9%) and human activities being major reasons for climate change (96.6%).

Moreover, Pitpitunge (2013) pointed out that correct perceptions of climate change as well as unclear viewpoints on actions to mitigate climate change still exist among students and are related to gender. Choon et al. (2019) also found a relationship between environmental awareness, social trust as important factors to help people perceive risks as well as behaviour. However, the survey results did not demonstrate the mediating effect of risk perception on participation in green activities and climate change risk reduction. Recently, after literature reviewing dozens of studies from 2015 to 2020, Brosch (2021) has called for current research efforts to focus on establishing the causal pathways from affect and emotion towards climate actions.

However, more recent reviews such as studies on students' perceptions of the causes, consequences, and impacts of climate change and the influence of these perceptions on behavioral intentions to implement mitigation activities are still limited. Therefore, this study was conducted with the following research objectives: to assess university students' perceptions of climate change in terms of causes and impacts (consequences) on the economy, society, and

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nature; to determine the level of intention to implement climate change mitigation actions among the population; and to examine the relationship between perceptions of climate change and the level of intention to implement climate change mitigation actions. To achieve the research objectives, the article is structured into four parts. Besides the introduction, the article shows content related to literature, theoretical framework, and research methods in section 2, next section provides research results and discussion, and the final section is conclusion and research implications.

LITERATURE REVIEW

Causes of Climate Change

For thousands of years, the Earth's atmosphere has changed very little. The temperature and the balance of heat-trapping greenhouse gases have always been at levels that are comfortable for humans, animals, and plants to survive. A few decades recently, however, humans are facing a serious imbalance and are struggling to rebalance it to a state that is safe for life. As we burn fossil fuels to heat our homes, drive our cars, generate electricity, and manufacture all sorts of products that serve our lives, we are adding more and more greenhouse gases to the atmosphere. As a result, the warming potential of the natural greenhouse effect has been greatly increased, creating causes for environmental concern and climate change (Shivanna, 2022).

The research topic related to student perceptions of the causes of climate change has been globally conducted in numerous studies, and some of them are mentioned in the following section. According to Wachholz et al. (2014), 75% of the students think that climate changes are occurring now, and 81% recognizes their cause by the human activity. In addition to the main cause of climate change being caused and exacerbated by human activities, the research results by Bollettino et al. (2020) also show that the respondents' views are that natural factors are others the causes of climate change. Meanwhile, some also believe that climate change is caused by supernatural factors, God's will, or a combination of human activities and supernatural elements (Haq & Ahmed, 2020).

Moreover, Morgado et al. (2017) investigated students perception of climate change from universities over three countries includes: Portugal (Europe), Mexico (North America) and Mozambique (Africa). Based on results from the research, 72%-82% respondents understood that climate changes have a considerably significant influence on their local communities and in other parts of the world and almost all of them believe that the human activity represents a significant factor of climate changes. Similarly, Nefat and Benazić (2019) proved that 206 over 217 of participants (95%) among students attended the survey who have heard about climate changes think that these are really occurring and 167 over 217 respondent agree with statement from scientist that climate changes have been caused by human activities.

In Vietnam, Thuy and Tuan (2019) conducted a survey with 352 students from Ho Chi Minh City University of Technology and Education. The majority of surveyed students attributed climate change to environmental pollution, while a smaller number cited population increase, and only 1.7% answered natural causes. Thảo (2020) surveyed and collected research samples at Ho Chi Minh City University of Food Industry. According to the students, the most evident appearance of climate change is the change in temperature. Manifestations such as droughts,

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floods, storms, tropical depressions, rising sea levels, and saltwater intrusion are also becoming increasingly apparent.

Perception of Climate Change's Impacts

One of the early studies by Lorenzoni and Pidgeon (2006) warned that human operations uncontrolled on the climate system may lead to changes that will put various aspects of life on Earth in danger. Following content provides literature review of studies related to students' perceptions of climate change impacts from two perspectives: impacts on nature and impacts on the economy, society, and human beings.

Impacts of Climate Change on Nature

The Special Report on the Ocean and Cryosphere in a Changing Climate, published in 2019, addressed numerous issues related to the impacts of climate change on marine, terrestrial, and icy ecosystems (Pörtner et al., 2019). According to the report, rapid changes in climatic conditions and increased carbon dioxide levels have severely affected ecosystems, freshwater supplies, air, fuel, clean energy, food, and human health. Under the impact of rising temperatures, air, and melting ice, the number of coral reefs is increasingly declining. This indicates that both terrestrial and aquatic ecosystems are suffering from the effects of floods, droughts, wildfires, and ocean acidification.

Many studies have shown that people's views when asked have increased concerns about the level of impact, risks from climate change as shown by disasters, and extreme climate events, such as the study on climate change awareness in some European countries (Spain, the Netherlands, Great Britain and Germany) accomplished by (Hagen et al., 2016). Studies on students' assessments of the risks and impacts of climate change such as (Ahmed et al., 2021; Kundariati et al., 2024; Morgado et al., 2017; Nefat & Benazić, 2019; Ofori et al., 2023).

Impacts of Climate Change on the Economy, Society, and Human

According to Thảo (2020), 80.5% of surveyed students believe that climate change has the greatest impact on agricultural production. In fact, agricultural production depends heavily on natural factors such as land, water resources, climate, hydrological regime, temperature, humidity, etc., so it will be the industry most heavily affected by climate change in Vietnam. Bùi Văn Hiển et al. (2019) has studied the impacts of climate change on health, and the percentage of students who know that climate change causes diseases related to air pollution and diseases related to extreme weather events is high. Meanwhile, mental health-related diseases and malnutrition are known only by 47.4% and 54.3% of students. Infants, young children, and the elderly are sensitive groups of people who are susceptible to diseases due to the effects of external factors, so students think that these are the two most susceptible groups of people. In addition, students believe that people with low socioeconomic lives, ethnic minorities and local people are less affected by climate change because some students believe that there is no association between quality of life and health status.

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Climate Change Mitigation Activities

The research of Kundariati et al. (2024) concluded that the majority of students are aware that climate change is real, understand that climate change is caused by humans, the impact of climate change has also been felt now and will worsen in the future. Students have used to do good things to save energy, such as turning the electricity devices when they are no longer used, using bicycles when going to places that are not far away, and carrying bags for shopping. Although, some students stated that they did not use bicycles and did not carry shopping bags. Choon et al. (2019) based on data collected from 191 respondents with different level in education, proved that higher social trust will lead to higher risk perception that can significantly influence how people react, address and support climate change mitigation and adaptation initiative which is include four observations (Household products are environmental friendly; Reduce the electricity consumption; Switch to environmental friendly products; Fix things rather than replace; Switch off all electricity devices in the house when it is not in used). Similarly, Ratinen (2021) also proved that knowledge of climate change adaptation and climate change mitigation knowledge were the strongest positive predictors by climate change knowledge. The study reveals that the students had a relatively high level of knowledge of climate change adaptation and climate change mitigation which are measured by little actions necessary to reduce impacts from climate change (use public transport more, walk and bicycle more, avoid foods waste, reducing dairy products, reducing dairy products, purchase less goods…)

THEORETICAL FRAMEWORK

Some prominent theoretical models for analysing behavioural intent are the Reasoned Action Theory Model (TRA) and the Planned Behaviour Theory Model (TPB). Ajzen and Fishbein (1980) define behavioural intent as an expression of a person's willingness to perform a prescribed behaviour, and it is considered a direct precursor to behaviour. Intentions based on estimates include: Attitudes that lead to behaviour, subjective standards, and perceptions that control behaviour. With the TRA, the author points out that: The most important factor that determines a person's behaviour is the intention to perform that behaviour. Intention to perform an act is governed by two factors: a person's attitude towards behaviour and subjective standards related to behaviour

TPB theory was supplemented with Ajzen (1991) by proposing an additional cognitive factor that controls behaviour, indicating that the individual has a pre-planned plan for the implementation of the behaviour to express the scale for the intention factor that leads to the behaviour. The TPB model later became the theoretical foundation applied to research in many different fields in terms of behavioural intent. The scale of intention leading to behaviour was developed by (Taylor & Todd, 1995) based on the concept raised by Ajzen (1991). Taylor and Todd argue that intention leads to behaviour that manifests itself when the customer intends to use the product and will use the product as soon as possible. Many studies on the same topic of students' perceptions of climate change and climate change mitigation behaviours also apply these background theories to develop research hypotheses (De Leeuw et al., 2015; Halder et al., 2016; Masud et al., 2016). Accordingly, the article is based on this theory to serve as a basis for the hypothesis related to learners' perceptions affecting their willingness to implement climate change mitigation activities developed in the research hypotheses section below.

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RESEARCH METHODOLOGY

Research Hypotheses

Students' awareness of climate change plays a very important role in responding to climate change. A review of published studies concerning the subject reveals that the level of climate change awareness among students at the Vietnam National University of Agriculture was found to be at an average level. In particular, the level of awareness of the causes of climate change is quite high (Nguyễn Tất Thắng et al., 2013). The level of awareness of students in Bangladesh about climate change was assessed mainly through the causes of climate change (Haq & Ahmed, 2020). At the same time, according to Thảo (2020) research assessing the main factors contributing to climate change awareness, students at Ho Chi Minh City University of Food Industry have an average level of awareness of climate change, the majority of students have fully understood the causes of climate change.

Students at Ho Chi Minh City University of Technology and Education in Vietnam have a full awareness of climate change, as well as the causes of climate change. And that is why students take actions to contribute to minimizing climate change and its impacts (Nguyễn Thị Như Thúy & Đặng Thị Minh Tuấn, 2018). Similarly, according to (Thông & Vi, 2020) when students are aware and understand the causes and negative impacts of climate change, they will find ways to minimize climate change. Students' participation in environmental organizations that help reduce climate change is related to their awareness of the causes of climate change (Haq & Ahmed, 2020). Awareness of the causes of climate change is one of the most common outcome variables affecting individual actions in the research framework of public awareness of climate change (Yu et al., 2013). Accordingly, the hypothesis about the relationship between awareness of the causes of climate change and climate change mitigation activities is stated as follows:

H1: Awareness of the Causes of Climate Change Impacts Climate Change Mitigation Activities

According to research Bostrom et al. (2006), risk perception plays an important role in predicting behavioural intentions. Risk perception is not a substitute for general environmental beliefs, but it significantly influences people's behavioural intentions. Perception of climate change risks affects climate change behaviour and is a key factor in supporting climate policy measures (Frondel et al., 2017). Perception of climate change risks is not only an important part of shaping climate policy but also plays a central role in generating support for adaptation and mitigation initiatives; deciding on activities to help mitigate climate change (Choon et al., 2019; Kundariati et al., 2024; Lujala et al., 2015). Based on the empirical results of previous studies, the theoretical approach of TRA and TPB (mentioned in the previous section), the hypotheses on the impact of climate change awareness on climate change mitigation actions of students are proposed as follows:

H2: Perception of the Impacts of Climate Change has a Positive Impact on Climate Change Mitigation Activities;

H2a: Perception of the impacts of climate change on nature has a positive impact on climate change mitigation activities

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H2b: Perception of the impacts of climate change on human society and economy has a positive impact on climate change mitigation activities

Questionnaire and Variables Measurement

Based on the theory, literature review researches related to the research objects that has been published in Vietnam and internationally, the underlying theories, the survey form was inherited, developed and completed including 2 parts: general information (information about participants) and 22 questions, measured by a 5-point Likert scale, on students' assessment of the causes of climate change, impacts of climate change on nature, economy, society and people, and the level of readiness to implement activities to mitigate climate change. In which, the group of factors assessing the causes of climate change includes 3 questions, the group of factors assessing the impacts of climate change on nature includes 6 items and the group of factors assessing the impacts on the economy, society and people includes 7 items, and the group of questions developed and used to assess the views on readiness to implement activities to mitigate climate includes 6 questions. The groups of observed variables measuring the variables in this study are presented together with the descriptive statistics and scale reliability results in Table 2 in the following section.

Sample and Data Collection Methods

Convenience sampling and snowball sampling methods were used in the study. The convenience sampling method was chosen due to the accessibility and willingness of the research team members to participate in the survey among their friends who are Thuongmai University (TMU) students. The survey was sent to those subjects and through them, the survey was sent to the others students (snowball method). In addition, the above sampling method also helped the study reach a variety of students in different courses at the TMU with different perspectives, while saving time and costs for conducting the study. The research process commenced with a pilot survey, administered to 30 students (selected via convenience sampling), to refine the questionnaire instrument. Following the pilot phase, feedback from participants was incorporated to finalize the questionnaire. The definitive questionnaire was subsequently distributed to Thuongmai University students from October 2024 to February 2025, employing a mixed-mode collection strategy that included both direct, in-class surveys and electronic surveys via Google Forms. Post-collection, a rigorous data cleaning process was implemented, resulting in a final sample of 350 valid response samples after the elimination of invalid submissions. The cleaned data set was then analysed using SPSS version 20 software to conduct the analysis and test the proposed research hypotheses. The specific measurement scales for the observed variables, along with the results of the scale reliability analysis and descriptive statistics, are presented in Table 2 of the results section.

RESULTS AND DISCUSSTION

The results in Table 1 below show that among the students who participated in the research team's survey, the number of female students accounted for a higher proportion (64.86%) while the number of male students was lower with 123 students per 350. In general, among the total number of students participating, sophomore students accounted for the highest proportion (33.43%), while the number of senior students approached had the lowest number (14.86%).

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Meanwhile, first-year students and third-year students account for about a quarter (25.4% to 26.3%). This result is in line with the convenient sample selection method, as most of the members are 2nd year students.

Table 1: Participants' Demography

Genders			**Student**		
	Frequency	**Percentage**		**Frequency**	**Percentage**
Male	123	35.14	Freshman	89	25.43
			Sophomore	117	33.43
Female	227	64.86	Third year	92	26.29
			Senior	52	14.86
Total	350	100%	Total	350	100%

Source: The analysis results from data of the authors

The results described in the Table 2 following show that the average value of each observation used to assess students' perception of climate change ranged from 3.59 (observed with the code act3) to the largest value of 4.16 (observed with the code act1), accompanied by the corresponding standard deviation with values ranging from 0.876 (esco4) to 1.124 (act3). The right part of the table above presents the scale reliability of the variables. The results show that the Cronbach's Alpha value of each group of variables with a value of 0.770 to 0.880 is a high-value region, indicating that the observed variables used are well explained and reliable for each factor.

Table 2: Descriptive statistics, Cronbach's alpha, and composite reliability

No.	Code	Observations	Variables	Mean	Std. Dev	Cron	Summary Item
1	caus1	Climate change can be a consequence of natural phenomena themselves (e.g., volcanic activity, solar system activity, ocean currents...)	Causes of climate change	3.86	0.987	0.770	Mean: 3.859 Min: 3.811
2	caus2	Population growth could be to blame for climate change.		3.81	1.048		Max: 3.906
3	caus3	Climate change is mainly a consequence of human activities		3.91	0.963		
4	ecso1	Climate change will reduce the standard of living of many people around the world.	The impact of climate change on the economy and society	3.96	0.996	0.875	Mean: 4.021 Min: 3.889 Max: 4.123
5	ecso2	Climate change causing hot and humid conditions will increase the risk of spreading diseases and infections.		4.12	0.876		
6	ecso3	Climate change causes extreme phenomena that damage housing buildings, loss of accommodation, disruption of education, health, and public life.		3.99	0.98		
7	ecso4	Low-income groups or in deep-lying,		4.1	0.926		

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		remote and disadvantaged areas are more heavily affected by climate change.					
8	ecso5	Climate change impacts many economic sectors that seriously threaten global economic growth and development.		4.01	1.006		
9	ecso6	Climate change is increasing and negatively impacting production efficiency, and increasing the cost of remediation.		3.89	1.011		
10	ecso7	Climate change drags down the development and prosperity of the economy of countries and regions.		4.08	0.95		
11	tdtn1	The increasing global average temperature is causing wildfires, droughts, and desertification...	Impact of Climate Change on nature	3.88	0.987	0.866	Mean: 3.888 Min: 3.746 Max: 3.957
12	tdtn2	The melting ice will cause sea levels to rise, which can lead to "sea erosion".		3.87	1.103		
13	tdtn3	Water became scarcer in more and more areas.		3.93	0.987		
14	tdtn4	Terrestrial and aquatic ecosystems are gradually being destroyed.		3.94	0.951		
15	tdtn5	The creatures in the world are disappearing and are in danger of extinction.		3.75	0.976		
16	tdtn6	Climate change will cause the Earth to experience more extreme climate events with more intensity		3.96	0.976		
17	act1	I'm willing to change my behavior to help limit climate change.	Climate Change Mitigation Activities	4.16	0.931	0.880	Mean: 3.959 Min: 3.589 Max: 4.167
18	act2	Using public transportation (bus, train, ...) or walk or ride a bicycle more often...		3.81	1.023		
19	act3	Using less air conditioning in the summer and less heating in the winter.		3.59	1.124		
20	act4	ready to classify garbage and recycle waste according to regulations to contribute to environmental protection.		4.11	0.956		
21	act5	to participate in activities to mobilize and propagate environmental protection against climate change.		4.01	0.984		
22	act6	to limit the use of products, single-use plastic utensils and plastic bags.		4.07	0.944		

Source: The analysis results from data of the authors

The test results presented in Table 2 above show that the Cronbach's Alpha coefficient of variable act (Climate Change Mitigation Activities) is equal to 0.880 > 0.6, and the observed variables have a variable-total correction correlation greater than 0.3. The values of Cronbach's Alpha scale, which measures if one observation variable is eliminated from the other observation

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variable, are all less than or equal to 0.880. Thus, the scale is reliable, and the observed variables all explain well the factors that climate change mitigation activities.

Table 3: Exploring Factor Analysis of independent and dependent variables

Independent variables	Components			Dependent variables	Component
	1	2	3		1
caus1			.739	act1	.772
caus2			.759	act2	.797
caus3			.735	act3	.681
ecso1		.537		act4	.794
ecso2		.573		act5	.864
ecso3		.559		act6	.853
ecso4		.595			
ecso5		.762			
ecso6		.749			
ecso7		.752			
tdtn1	.708				
tdtn2	.646				
tdtn3	.659				
tdtn4	.761				
tdtn5	.741				
tdtn6	.668				
Initial Eigenvalues	61.412%			Initial Eigenvalues	63.32%
Total Extraction Sums	7.662	1.155	1.009	Total Extraction Sums	3.799
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.942			Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.868
Bartlett's Test of Sphericity	Approx. Chi-Square	2779.357		Bartlett's Test of Sphericity	Approx. Chi-Square	1082.866
	Df	120			df	15
	Sig.	.000			Sig.	.000

Source: The analysis results from data of the authors

According to the results of the EFA analysis presented in Table 3 above, for the observation group measuring the cognitive variables of the causes and impacts of climate change, we see that the total variance extracted is 61.412% > 50%, proving that the EFA model is suitable. In addition, the initial specific value of the 3rd factor, the lowest value of 1,009>1 is satisfactory. Thus, 16 initial observations have been extracted into 3 factors with sufficient and summarized information. Then, 3 factors including awareness of the causes, perceptions of the impact on nature, impact on the economy, society, and people of climate change, were extracted and condensed to 61.412% of the variables observed. This suggests that conceptually, it is reasonable to use the above three groups of factors to statistically explain students' perceptions of climate change (Beavers et al., 2013). Similarly, for the observation group measuring the variables of perception of climate change mitigation actions, the total variance extracted was 63.32% > 50%,

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proving that the EFA model is suitable. At the same time, the initial unique value of 3,799 >1 is satisfactory.

Table 4: Coefficients of correlation

Model		Standardized Coefficients	t	Collinearity Statistics	
		Beta		Tolerance	VIF
1	(Constant)		3.626		
	CAUSE	**0.230*****	4.730	.551	1.815
	ECSO	**0.227*****	4.005	.406	2.465
	NATUR	**0.384*****	7.180	.454	2.201
N		350			
R-Squared adjusted		0.5455			
Durbin-Watson		2.037			
F		140.634			

*Note: *p < .05, **p < .01, ***p < .001. Significant predictors in the final model are shown in bold, dependent variable is Acti (climate change mitigation activities)*

Source: The analysis results from data of the authors

Results in Table 4 show that the normalized beta coefficient of the climate change awareness factor (0.230) with a statistical significance level of less than 0.01 showed that when students had a high perception of the causes of climate change, they also had a level of readiness to take climate mitigation actions. In other words, the H1 hypothesis is accepted. Similarly, the standardized beta coefficients of two remaining factors (Ecso and Natur) of 0.227 and 0.384, respectively, both have statistically significant values at level lower than 1%, indicating that learners are more aware of the risks and impacts of climate, the more likely they are to be willing to carry out activities to mitigate climate change. This result, one side, indicates that H2a, H2b hypothesis are accepted and other side reinforces and further affirms the results of the relationship between climate change awareness and climate change mitigation actions carried out by (Choon et al., 2019; Kundariati et al., 2024; Lujala et al., 2015). Moreover, the VIF variance magnification factor is used to test the degree of alignment of a variable. Since the VIF results of each of the factors presented in the table above, are all less than 5, it can be confidently concluded that the probability of multi-linearity is almost non-existent.

CONCLUSION

Through our research, we found that climate change awareness plays a crucial role in influencing the intention to take actions that contribute to climate change mitigation. This awareness has the power and decisive significance in the intention and behaviour of implementing climate change mitigation. First, students' perceptions of the causes of climate change are the most influential factors on what actions to take to reduce the risks of climate change. They realize which cause is the main one, and decide to take actions to minimize risks based on that cause. Secondly, the higher the level of awareness about climate change, the greater the intention to take action. When the severity of the problem is recognized, action will be promoted. Finally, we argue that the success of variables that perceive the risks of climate change will explain the intentions and

behaviours that will attract the attention of more other actors interested in this issue. Previous studies on intentions and behaviours towards climate change such as: awareness of students of Hanoi University of Agriculture about climate change and the impact of climate change on the development of agriculture, forestry, fishery and people's lives in rural areas of Vietnam. Besides, Lorenzoni and Pidgeon (2006) have proven that barriers perceived by the UK public to engaging with climate change have policy implications.

The results of the study showed that TMU students' awareness of climate change is quite adequate, its impacts on nature, socio-economics, people and its connection with readiness to take mitigation actions. This result implies that, on the one hand, higher education institutions need to strengthen communication forms, make the most of social media channels to raise students' awareness of climate change, the impacts of climate change and mitigation actions. On the other hand, it is necessary to combine or build more modules, courses, extracurricular programs, and lectures to raise in-depth awareness of the current urgent issue in response to the call from UNESCO (2017) that mentioned in previous section. From there, equip and provide generations of educated citizens with full understanding of climate change to be ready to adapt as well as take mitigation actions.

Ethical Clearance

Ethical consent was sought and obtained from the participants used in this study. They were made to understand that the exercise was purely for academic purposes, and their participation was voluntary.

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Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Availability of data and materials

The datasets on which conclusions were made for this study are available on reasonable request.

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