



Raising the curtain on climate action: Design and impact-assessment of a theatre-based intervention on climate action efficacy among young adults in India

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Abstract

Climate change is an intricate phenomenon that arches over the environmental, economic, and social horizon of the world. Several approaches, including lecture-based teaching, have been adopted to convey the threat of climate change to different groups. However, there has been limited translation of learning into constructive action. This underscores the necessity for innovation in climate change communication. Consequently, this project based in India developed and tested the impact of a participatory theatre-based intervention on young adults' attitudes toward the environment, pro-environmental behaviours, and individual and collective efficacy for climate action. A four-week immersive theatre workshop spread over eight bi-weekly sessions was delivered to college students, culminating in the staging of a play. Data was gathered from 72 undergraduates at pre-test, and 20 at post-test. Data was collected using a mixed-methods design (self-report scales and focus group discussion). Findings revealed statistically significant improvements in environmental attitudes, pro-environmental behaviours, and individual and collective efficacy towards climate action. Reflexive Thematic Analysis (RTA) of the focus group revealed the importance of novel climate change communication, the role of the workshop in bolstering participants' sense of responsibility and efficacy regarding climate action, the impact of the workshop on participants' personal growth, and areas for improvement in future iterations of the workshop. This pilot study highlights the potential of theatre-based interventions towards mobilising climate action and stresses the need to scale this approach in educational settings.

Keywords Climate action · Theatre-based intervention · Efficacy · Young adults

Introduction

The global climate scenario

The world experienced its warmest January till date in 2024 (Copernicus Climate Change Service, 2024), glaciers retreated across the globe (Paddison 2024), air quality

reached its most hazardous level yet (American Lung Association, 2024), and rising sea levels reached record highs (Chauhan 2024). Climate change not only impacts the temperatures that humanity must endure, but also the ability to access clean air, water, and food. Some of the outcomes of climate change on human health include respiratory issues, foodborne and waterborne diseases (World Health Organization, 2023), as well as post-traumatic stress disorder and depression (Padhy et al. 2015). Thus, climate change is not only an environmental concern, but also a pervasive social, psychological, and physical issue. The impact of the climate crisis may be most severe in developing nations, specifically those that have limited healthcare infrastructure to manage the effect of climate change on human life. An example of this is India, with its current population estimated at 1.44 billion - the largest in the world (United Nations Population Fund – UNFPA, 2024), and a vulnerability to climate

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change that is burdening its economic and healthcare resources (Debnath et al. 2023).

Climate change in India

India is enduring the third highest air pollution levels in the world according to IQAir, a Swiss air quality monitoring body (The Indian Express, 2024). The Environmental Performance Index (EPI) 2022 which evaluated 180 countries on *climate change performance, environmental health, and ecosystem vitality* outlines several of India's challenges with sustainability. These include poor ambient air quality, unsafe drinking water and sanitation, threats to biodiversity and habitat, and rising greenhouse gas emissions (Wolf et al. 2022). The Organisation for Economic Co-operation and Development (OECD, 2012) predicted that the highest number of premature deaths linked to ground-level ozone by 2050 are likely to be in India and China. These alarming figures call for urgent measures to urge the Indian populace to act as catalysts for climate action.

Human behaviour and climate change

Human activity has been the main driver of climate change, most notably through actions such as the unchecked burning of fossil fuels (Turrentine 2022). This has severely increased greenhouse gases, making the planet warmer. Therefore, it is imperative to seek solutions for climate change in the realm of human behaviour. Understanding and fostering *pro-environmental behaviour* - behaviour consciously aimed at reducing the negative or harmful effect of human action on the environment (Kollmuss and Agyeman 2002) – can prove favourable in this regard. Ajzen and Fishbein (1980) contended that *intention* is the strongest predictor of tangible behaviour. This intention is determined by three constructs, namely, one's attitude towards the behaviour, one's subjective norms, and one's behavioural control over the situation in which one is expected to act (Blok et al. 2015). According to Gadenne and colleagues (2011), *environmental attitude* refers to an individual's collection of beliefs, emotions, and intentions regarding activities and issues concerning the environment (Schlutz et al., 2004). This has the potential to influence one's engagement in energy-saving behaviour. Several studies show an affirmative relationship between pro-environmental attitude and ecological behaviour (see La Barbera et al. 2014).

A global survey by Andre and colleagues (2024) provides evidence for widespread endorsement of pro-climate social norms and demand for intensified political action. Constructively channelled human efforts hold the promise of sustainable solutions to manage climate change. A transnational study centred on the role of behavioural change in

tackling the climate crisis underscores the importance of “bottom-up” changes involving individual and collective efforts (Vlasceanu et al. 2024). Their findings offer mixed feedback on the effect of behavioural climate interventions, varied by participants and target behaviours. These findings also highlight the requirement for more and diverse intervention studies to improve the understanding of this emerging research area.

The need and potential to mobilise youth

Youth, i.e., young adults are among the most vulnerable populations subject to the impacts of climate change (Spanring and Hawke 2022). While this may connote bleakness, hope can be drawn from the potential strength in youth numbers. India has a youth population of over 800 million people below the age of 35 (Observer Research Foundation, 2023). According to the All India Survey on Higher Education (AISHE, 2021-22), an estimated 43 million students are currently enrolled in higher education institutions across the country (Planning, Monitoring and Statistics Bureau, 2022). Globally, youth-led climate action endeavours have had remarkable outcomes, such as highlighting the urgency of the climate crisis, framing climate change as a social justice issue, and calling out the global inaction on climate change (Han and Ahn 2020). Tapping into this demographic group may be not only practical, but also essential to create real-time impact for climate action, not only because of their promising size, but also because of their increased risk to the effects of climate change as compared to older generations.

Need for novel solutions for climate change

There is evidence that didactic, lecture-based approaches to climate change education have not been effective in influencing students' attitudes and behaviour (Rousell & Cutter-Mackenzie-Knowles, 2020). Simply communicating the threat of climate change may be inadequate in generating behavioural change (Jugert et al. 2016) and may even evoke socially defensive reactions (Fritsche et al. 2012) or denial (Hornsey et al. 2015). Thus, it is crucial to promote *efficacy* and convey that change is possible when people act together (Jugert et al. 2016). Efficacy may be conceptualised in two ways: self-efficacy and collective efficacy, as explained within a sub-model of Bandura's social cognitive theory (as cited in Hensel et al., 2022). Bandura's social cognitive theory (1999) is widely cited within research about climate change efficacy (e.g., Clayton 2020; Roser-Renouf et al. 2014; Thaker et al. 2019). While self-efficacy encapsulates the belief in one's competence to perform an action (Witte and Allen 2000), collective efficacy may be understood as a

shared belief held by members of a group about their capability to perform a particular task (Salanova et al. 2014).

The typically ‘alarmist’ tone of climate change education, paired with the perceived lack of achievability of climate action or low climate action efficacy, may contribute to *green fatigue* – a general oversaturation and disinterest in learning about climate change (as cited in Haslett et al. 2011). This highlights the necessity for participatory, interdisciplinary, creative, and affect-driven approaches to climate change education. In India, where even though environmental education has been incorporated into its classrooms, there is a need to remodel the curriculum to sensitise students about local issues in an accessible way (Puri et al. 2021).

The power of the creative arts

Martin et al. (2013) emphasize that arts exposure and engagement contribute to the cultivation of positive social and academic outcomes. Arts participation can also involve the experience of a flow state - a period of engagement with a work of art that can result in intense focus and connect an individual to the greater world through an increased understanding of others’ perspectives (Meeks et al., 2020). The creative arts comprise a wide range of forms, including linguistic and visual arts and performing arts like theatre and improvisation.

Empirical support for theatre as a tool for social change

There is growing evidence for how theatre-based interventions have been an effective tool for a variety of social concerns such as reducing the stigma around Human Immunodeficiency Virus (HIV) (Lightfoot et al. 2015), suicide (e.g., Keller et al. 2019), mental illness (e.g. Michalak, 2014), and promoting health equity for queer people (e.g., Logie et al. 2019).

In India, theatre has been used as a tool to generate awareness about mass social issues like child marriage, domestic violence, maternal and child health (Brahma et al. 2019), and LGBTQIA+ acceptance (Pufahl et al. 2021). Particularly, cyclo theatre – the practice of carrying theatre through bicycle tours in rural Odisha, India, that employs unconventional performance spaces, collaboration with local organisations, and a dialogue with the spectators – has been widely used to raise awareness of gender and environmental concerns (Mandal 2024).

Consequently, we identified the promising potential of a forum theatre-based intervention for climate action efficacy. Forum theatre is a genre of theatre that demands responses from the audience about alternate measures that the protagonist could have taken to overcome the obstacle in the story (Muharemi 2020). Audience members are asked to change the ending by participating on stage as actors (or

spect-actors), by the mediator or the “joker,” a crucial element of forum theatre (Puvaneyshwaran et al. 2025). This style is known to challenge the passivity of the communicator-receiver model of conventional theatre (Brahma et al. 2019), thus encouraging an active approach to the play. Thus, forum theatre can use novel portrayals of climate change to allow for more efficacy-based narratives.

The current study

This study aimed to develop a theatre-based intervention and test its effectiveness in influencing young adults’ attitudes toward the environment, generating pro-environmental behaviour, and increasing self and collective efficacy toward addressing climate change. To make action-oriented behaviours a focus of this intervention, forum theatre has been utilised.

Additionally, local knowledge is crucial for enhancing community-led climate action as studies have demonstrated the beneficial impact of local stakeholders’ participation in climate adaptation planning and implementation (IPCC 2022, as cited in Elum and Snijder 2023). Thus, we adopt a participatory approach, with students co-creating the intervention while drawing from their own experiences with climate change. Using a mixed-methods design, this study provides an initial impact assessment of the newly designed intervention.

Rationale of the study

Only limited research has explored the impact of theatre-based interventions on climate change-related issues, highlighting the necessity for a study of this nature. Existing climate change imagery often employed within the multimedia realm is rarely associated with self-efficacy (Metag et al. 2016). A theatre-based intervention focusing on impacting individual and collective efficacy may help address this gap. Finally, this pilot study can serve as a foundation to scale the intervention to a culturally fit model of climate action efficacy embedded in educational settings. Policy recommendations such as the National Curriculum Framework 2023 suggest aligning educational goals with sustainable development objectives (National Steering Committee for National Curriculum Frameworks, 2023). The present study is an endeavour in that direction.

Objectives of the study

The present study had two main objectives:

1. To design an interactive theatre-based intervention to communicate the state of climate change and climate action efficacy among young adults in India.

- To conduct a preliminary impact assessment of this intervention in influencing environmental attitudes, pro-environmental behaviour, and efficacy towards climate action among study participants.

Methods

This study utilised a mixed-methods design for data collection before (Time 1) and after (Time 2) intervention participation. Most extant literature on theatre-based interventions has relied on a solely qualitative design, thereby limiting the generalisability of findings (see Keller et al. 2019), hence the inclusion of a quantitative element was considered crucial.

Participant recruitment

The recruitment (see Fig. 1) was conducted through purposive and convenience sampling. An open email invitation (see Appendix Fig. 4) invited students from the authors' university to participate in writing and performing an original play about climate change and climate action as part of a four-week workshop. The recruitment advertisement was also placed across popular locations on campus, including the cafeteria, library, gymnasium, dining halls, elevators, and hostels. Interested students were asked to register online. The authors then contacted registered participants

via email with details of the study. We offered a certificate upon successful workshop completion.

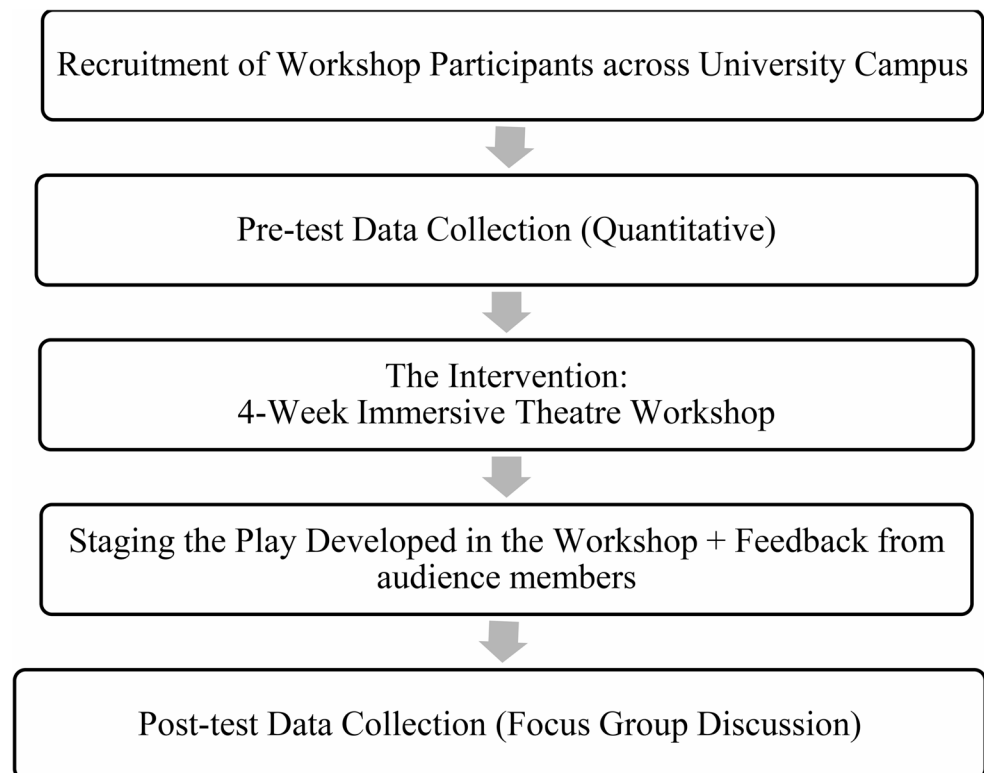
Participants

Out of 166 responses received to the call for recruitment, 72 participants aged 18 to 22 years (*Mean age = 19.15*, 74% female, 26% male) joined the introductory session of the four-week intervention (pre-test, Time 1).

70 participants were Indian citizens, one held American citizenship, and one held Singaporean citizenship. The students came from diverse academic backgrounds, including business, policy, liberal arts, psychology, law, international relations, architecture, banking and finance. Over the succeeding sessions, there was high attrition (72.2%) due to competing academic commitments and time constraints. To ensure rigor and fidelity, we only considered students who attended a minimum of six out of eight workshop sessions (75% attendance). Students failing to meet the minimum attendance criterion were excluded from the sample. Consequently, only 20 participants (*Mean age = 19.1 years*, 80% female, 20% male) completed the staging and post-test data collection (Time 2).

As a secondary participant group, we also sought feedback from 76 university students comprising the play audience. This group did not participate in the intervention per se.

Fig. 1 Process of participant recruitment and data collection



Ethical considerations

The study received clearance from the institutional ethics review board. In the introductory session, prospective participants were briefed about the scope of the study and assured of the anonymity and confidentiality of their responses. They were also informed about their right to withdraw from the study at any point and were provided with a digital consent form via Microsoft Forms. Participants were given the discretion not to reveal any personal identification details and were assigned a unique identification code, accessible only to the investigators.

Data collection tools

We used a mixed-methods design that aligned with the study objectives to generate climate action efficacy (via the 4-week intervention) and assess the intervention impact. The quantitative data represents individual environmental attitudes, frequency of pro-environmental behaviours, and efficacy perceptions before and after the intervention. The qualitative data offers in-depth insights through collective narratives explored in the focus group discussion.

Quantitative data collection (Time 1 and Time 2)

Participants completed the following scales through an online form:

New Environmental Paradigm (NEP) Scale (Dunlap et al., 2000): Participants' environmental attitudes were measured using the NEP Scale - a 15-item scale to assess attitudes towards the environment, rated on a 5-point Likert scale ranging from 1 'strongly agree' to 5 'strongly disagree.' It measures attitudes along five facets, - *limits to growth*, *anti-anthropocentrism*, *balance of nature*, *anti-exemptionalism*, and *ecological crises*. Sample items include, "We are approaching the limit of the number of people the earth can support," and "Plants and animals have as much right as humans to exist". This scale has been found to be reliable with an internal consistency of $\alpha=0.83$ (Dunlap et al., 2000).

General Ecological Behaviour (GEB-50) Scale (Kaiser, 2020): The GEB-50 Scale was used to assess participants' pro-environmental behaviours. This 50-item scale lists diverse pro-environmental behaviours and assesses participants' frequency of engagement. Each item was scored on a five-point Likert scale ranging from 1 'never' to 5 'very often' for the first 32 items, and 'Yes' and 'No,' for the remaining 18 items. Sample items include, "I ride a bicycle or take public transportation to work or school," and "I am a member of a carpool." The GEB-50 has been found

to be a reliable measure with a test-retest reliability (rtt) between .76 to .83 (Kaiser, 2020).

Perceived Self and Collective Efficacy Measures (adapted from Jugert et al. 2016): Ten items measured perceived self-efficacy and collective efficacy regarding climate action, on a 7-point Likert scale ranging from 1 'total disagreement' to 7 'total agreement'. We adapted the list of survey items from Experiment 4 by Jugert et al. (2016), catering to the general population. We selected the relevant items and modified the language to suit the study sample, for example, we replaced "large groups" with "university students." An example of a sample item is, "If we, as university students, decided to fight climate change, we would be able to take collective and coordinated action." The irrelevant items were also discarded.

Qualitative data collection (Time 2 only)

Focus Group Discussion: Intervention effectiveness and climate action efficacy were examined through a focus group discussion (FGD) after the staging of the play. This allowed participants to collectively consider the barriers to their agency in climate action and what they needed to develop and support it. The FGD also acted as a site for the researchers to gather feedback and allow for course correction for future iterations of the intervention.

In addition to the data collected from workshop participants, we also sought other report data in the form of an audience feedback survey. Respondents were asked Likert-type questions pertaining to feedback for the play, and individual and collective efficacy for climate action. They were also asked a 'Yes/No' question regarding the overall impact of watching the student play.

The intervention

Background preparation & intervention delivery

In developing a creative and participatory module on climate change communication and climate action, we designed a four-week immersive theatre workshop. The intervention consisted of eight bi-weekly sessions (see Table 1), and each session lasted up to ninety minutes. The agenda for each workshop session was prepared in advance by the primary researchers and shared with the research assistants to allow for the smooth facilitation of the sessions. Activities were designed in consultation with theatre artists who were experienced in forum theatre and performing arts for social change. We also relied on our own backgrounds and expertise in this process. The first author is a social psychologist

Table 1 Sequence, activities and underlying purpose of the Four-Week intervention

Sequence	Activities	Underlying Purpose
Week 1 (Sessions 1 and 2)	Rapport Formation and Orientation to the Theme ↳ Ice breakers and improvisation exercises to acquaint the participants with one another and the facilitator. ↳ Exposure to videos on perceptions around climate change and climate action, taken from the public platform YouTube.	<ul style="list-style-type: none"> • To facilitate participants' comfort on stage and allow them to shed any inhibitions. • To encourage participants to share their views and form the foundation of points that may later be used in their co-developed scripts. • To introduce discourse on individual and collective efficacy in climate action.
Week 2 (Sessions 3 and 4)	Group Division, Theme Allotment, and Script Development ↳ Introduction to stage acting, emoting, and movement. ↳ Collective reading of an open-source script on a pertinent climate change issue. ↳ Division into groups of 3 to 4, with each team working on any one of the EPI 2022 concerns for India. ↳ India-specific exposure to multimedia items on climate change and climate action. ↳ Script development drawing from participants' own experiences with climate change. Each group developed a script for 8–10 min of stage time.	<ul style="list-style-type: none"> • To enhance participants' ability to express themselves through performance, as actors and script writers. • To enable a locally driven understanding of climate change related concerns. • To enable participants to construct their own narrative around climate change and climate action.
Week 3 (Sessions 5 and 6)	Performance Rehearsal and Continued Exposure to Ideas for Sustainable Living ↳ Mock performances or rehearsals by each group. ↳ Detailed feedback by fellow participants and facilitator. ↳ Continued exposure to accessible ideas on sustainable living, and local stories on climate change.	<ul style="list-style-type: none"> • To facilitate script revisions and allow for perfecting the performance. • To enable participants to approach climate action from a viable and realistic lens.
Week 4 (Sessions 7 and 8)	Rehearsals and Staging ↳ Vocalisation exercises, rehearsals in public spaces, and staging of the participant-generated play.	<ul style="list-style-type: none"> • To refine the performance. • To let participants feel comfortable in the presence of viewers.

and trained theatre person. The second author is a professor with training in psychology and extensive experience as an education administrator and training facilitator across diverse stakeholders in higher education. While this domain expertise was necessary at the stage of intervention

development and pilot delivery, we do not envision this as a requirement for future iterations.

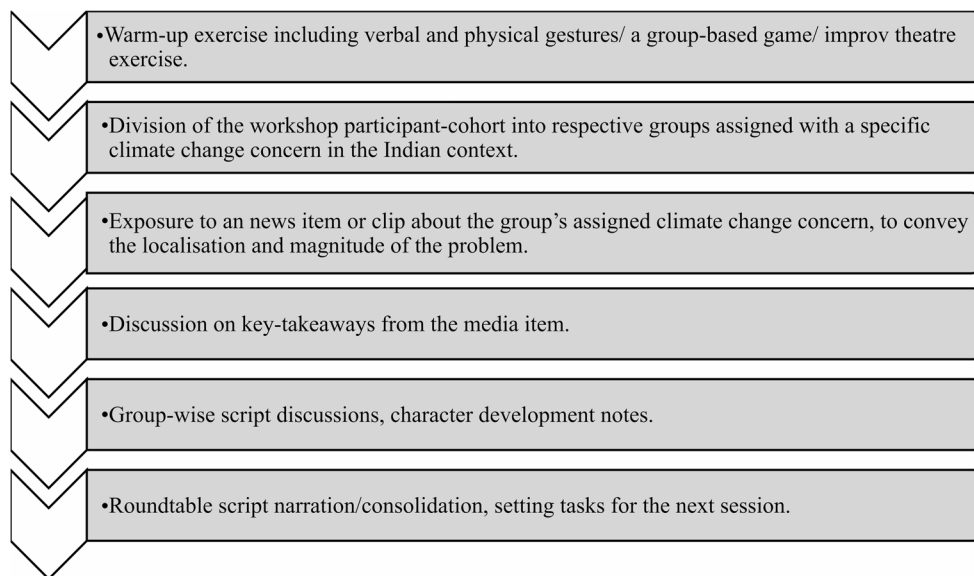
Every session in the first three weeks (Sessions 1–6) comprised a 'climate' component and a 'theatre' component, and the last week (Sessions 7 and 8) focused on rehearsals for the staging (see Fig. 2). Workshop activities took place at a designated rehearsal space on campus, and the final play (the participant-generated outcome of the workshop) was staged outside the campus cafeteria to generate a cascading effect for the participants' peers.

Week 1 (Sessions 1 and 2): Rapport formation and orientation to the theme

The first two sessions contained ice-breakers to acquaint the participants with one another and the facilitator. These included theatre games and improvisation activities, such as, 'Name and Gesture,' and 'Spaghetti!' to allow participants to familiarise themselves with the stage and the art of acting and reacting. For the 'climate' component, participants were shown two videos - 'What People Get Wrong About Climate Change' (Vox 2015) and 'Going Green Shouldn't be this Hard' (Vox 2017) on YouTube. These served as prompts for participant discussion on climate change and action. The research team noted points generated during the discussion, which would later contribute to the script development.

Week 2 (Sessions 3 and 4): Group division, theme allotment, and script development

The facilitator introduced the participants to the basics of forum theatre, stage parlance, blocking (synchronising stage movement with dialogue delivery), and demonstrated several ways to portray an emotion. The participants engaged in a roundtable reading of an open-source script on industrial pollution titled, 'The Wind from the East,' (Byrd 2006), from The Exchange Project, University of North Carolina at the Chapel Hill - adapted to the Indian context by the first author. The primary purpose of the script-reading was to orient participants to the general structure and writing style of a script, that incorporated climate-based narratives. Subsequently, the participants were divided into groups ensuring equal and uniform division. Self-selection was avoided to ensure groups were not skewed in number or strength. Each group was assigned to one of the following concerns informed by the EPI 2022's recommendations for India: (1) *Poor ambient air quality*, (2) *Unsafe drinking water and sanitation*, (3) *Threats to biodiversity and habitat*, and (4) *Accelerating greenhouse gas emissions*. Each group was exposed to local news on their respective topics. Drawing from these news items and their own experiences with climate change, they developed an original script of 8–10 min

Fig. 2 Detailed structure of a typical workshop session

of stage time. Participants assumed diverse responsibilities such as acting, writing, prop management, etc. The research team worked closely with each group to develop their script drafts. At the end of the fourth session, the research team gathered interim feedback and addressed any participant queries.

Week 3 (Sessions 5 and 6): Performance rehearsal and continued exposure to ideas for sustainable living

The facilitator trained participants in characterisation through writing and visualisation exercises. Each group developed and performed scripts on their respective theme in front of the participant cohort and research team. These mock performances were followed by group discussions and feedback from the facilitator and peers. Peer feedback was crucial in making the final play a participant-driven endeavour. There was continued exposure to media items on climate change in India through newspaper articles and the discussion of an online source of 101 Ways to Live Sustainably (Curbed 2019) in diverse facets of one's life. The participants embedded these ideas into their scripts as accessible ways for potential audience members to engage with climate action.

Week 4 (Sessions 7 and 8): Rehearsals and staging

In preparation for the final performance, the final two sessions consisted of vocalisation and articulation exercises, in addition to continued rehearsals and script revisions. Rehearsals were conducted in public spaces across the university to allow participants to acquaint themselves with the presence of the public.

Two additional rehearsals were scheduled after the planned eight-session intervention to allow participants to practice their scripts and strengthen their performance. Participants staged their in-house production on two consecutive days. The audience (other students across campus) was asked to fill out a digital form after the performance to share their impressions of the play.

Data analysis

Quantitative data was analysed using SPSS version 29. We employed paired t-tests to assess the pre-post intervention impact of the four-week workshop on participants' climate action efficacy.

The data collected from focus group discussions was recorded, transcribed, and anonymised. The analysis was conducted using the reflexive thematic analysis (RTA) framework (Braun and Clarke 2006, 2019). The RTA process allows for natural flexibility during coding and theme development, affording an active role to the researcher in generating new information (Byrne 2022). Given that study aimed to understand the participants' beliefs and sentiments around climate change and action and identify ensuing novel patterns of meaning that may emerge from these beliefs, RTA was deemed to be the most appropriate paradigm.

Ensuring reflexivity and credibility The researchers recognised the importance of maintaining a reflexive stance throughout the data collection and analysis. We also maintained awareness of our positionalities, backgrounds, beliefs, and experiences related to climate change and theatre. Guba's criteria (1981) were complied with to establish rigor and trustworthiness in the qualitative study. Credibility was ensured through peer and expert review,

Table 2 Pre and post-test quantitative data

Pre & Post-test		Paired Differences				t	Df	Significance		
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference			One-Sided p	Two-Sided p	
					Lower	Upper				
1	NEP Scale	10.600	9.28	2.07	-14.94	-6.25	5.10	19	<0.001	<0.001
2	GEB-50 Scale	14.40	15.30	3.421	21.56	7.23	4.20	19	<0.001	<0.001
3	Self-efficacy	7.25	8.35	1.86	11.15	3.34	3.8	19	<0.001	0.001

while transferability was achieved via thick description and purposive sampling. Data triangulation helped maintain dependability, enhancing the study's reliability and validity.

Results

This section presents findings from the quantitative data, followed by the qualitative findings and the results from the audience feedback survey.

Table 2 shows a statistically significant difference between pre-test and post-test scores on the NEP Scale, GEB-50 Scale, and efficacy measures following the intervention. In other words, the intervention resulted in marked improvements in participants' environmental attitudes and behaviors and their self-efficacy in environmental actions. These findings suggest that the intervention successfully enhanced environmental attitudes and promoted pro-environmental

behavior among participants. The qualitative study further explored and elaborated on this improvement.

Using reflexive thematic analysis to analyse the focus group discussion, we unveiled four broad themes, with sub-themes for certain topics (see Fig. 3). These are described in detail and supplemented with excerpts below.

1. Climate change communication: Need for novelty and generation of new ideas

This theme encompassed all participant responses pertaining to the importance of the *mode* of climate change communication and how it forms a critical aspect of the larger discourse on climate action. Responses corresponding to this theme were shared by 15 participants. They emphasised the importance of novel methods of message delivery, including but not limited to theatre and allied creative arts, while also providing accessible solutions for achieving this

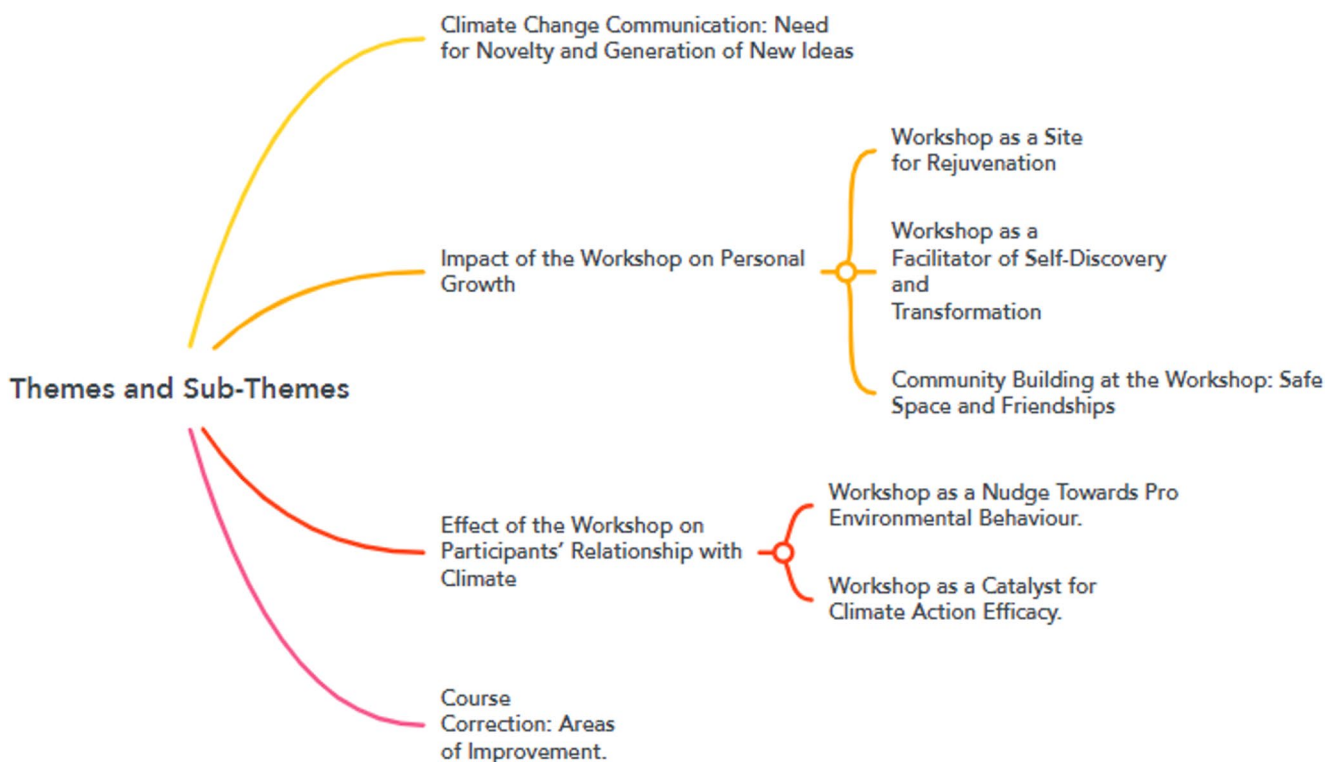


Fig. 3 Visual summary of the themes and sub-themes from the focus group discussion

aim. While some participants stressed the importance of promoting generic economical and feasible solutions (such as carpooling), others offered specific steps such as displaying flyers with simple eco-friendly solutions for students across campus, implementing a university-wide environmental code of conduct, etc.

We need to explore options that might appear a little more economical to people and not make them feel like they were going out of their way to do something... not making it a chore to have to save the climate.

(Respondent 9)

There is something that needs to trigger people and get them to feel that climate change is real...when I mentioned to my friends that there is a theatrical production taking place, that hugely interested them to consider watching. This is something we should pursue.

(Respondent 4)

2. Effect of the workshop on participants' relationship with climate action .

This theme discussed the impact of the workshop on how participants perceived their own efficacy towards climate action, as well as their increased engagement in pro-environmental behaviour. This theme contained two subthemes as described below:

2.1 Workshop as a catalyst for climate action efficacy

This subtheme comprised participant responses on how the workshop fostered a sense of personal responsibility and efficacy to fight climate change among the participants. 14 participants reported that they noticed a change within themselves as they compared their beliefs before and after the workshop. They discussed that they realised the importance of personal involvement and the need for individual action to boost collective action. They mentioned that the simple, accessible sustainable behaviours shared during the workshop helped promote their sense of efficacy toward climate action. They also discussed their belief in the potential of university students to take collective climate action. The essence of this subtheme can be found in the following excerpt:

At the starting (of the workshop) I strongly disagreed with the point that personally you can't make a change to the climate crisis...Something somehow changed a lot when we did these interactive sessions...at the

end while I was filling out the form...I strongly agree that on your personal level, you can make a lot of changes...and trying to do it at a university level will change something for sure.

(Respondent 18)

2.2 Workshop as a nudge towards pro-environmental behaviour

This subtheme encapsulated participants' increased awareness of their own environmentally unsustainable habits and a growing commitment to pro-environmental behaviour, citing their exposure to accessible eco-friendly solutions during the workshop. Six participants discussed incorporating small yet meaningful changes into their daily habits, such as reducing/substituting disposable cups and tissues, choosing eco-friendly methods for pest control, consolidating multiple online orders, and encouraging their friends to incorporate such changes. The subtheme has been expressed in the following excerpt:

In the first two sessions, the videos that were shown, were really impactful for my decision to buy a tumbler. And it just made me realise how I used to be using...three, four cups for coffee. And if I see any of my close friends, using a lot of cups I say, "Buy one tumbler, what will you lose?" And I rarely use tissues now, and even forks, spoons- I think before taking it because I know water will be used to wash them. These small changes have been brought into my daily habits, because I know the scale of things I used to do and I brought it down, so I think it is going to bring a change, however small it is.

(Respondent 17)

3. Impact of the workshop on personal growth

This theme encompassed responses that referenced the influence of the workshop in domains beyond climate change and action. This includes participant responses that emphasised the byproducts of the intervention, specifically the impact on their transformative journey with theatre, themselves, and each other. It comprised the following three subthemes:

3.1 Workshop as a site for rejuvenation

13 participants alluded to the workshop as a space of respite, rest, and relaxation. The theatre component of the workshop

served as a break from the participants' academically intensive schedules. They discussed the efficiency of the workshop structure, optimal frequency of sessions, and the balance between theatre-based and climate-based content. Participants found the workshop stimulating, the activities knowledgeable and enjoyable, and their interactions with the facilitator and among themselves engaging. According to one of the participants, "The unconventional activities of dancing, listening to music, and trying to flow with it was really fun and relaxing, it was something different. Some of us as students wanted something different than what we are academically doing."

3.2 Workshop as a facilitator of self-discovery and transformation

This subtheme captured participant responses on the role of the workshop in enabling them to shed inhibitions, boost confidence for public speaking and stage performance, and engage in self-exploration through the workshop activities. 11 participants described how they surprised themselves throughout the workshop – such as taking on acting roles as opposed to solely carrying out more reserved responsibilities like backstage chores. This was particularly highlighted by participants who engaged with theatre for the first time. The impact of the workshop percolated into other activities that the participants engaged in, such as campus events that involved public speaking. One of the respondents shared, "I thought me speaking in front of everybody would end here (at the workshop) but I tried...for campus elections, I spoke in front of fifty people and that would have never happened, if it wasn't for this workshop."

3.3 Community building at the workshop: Safe space and friendships

This subtheme encompassed all responses focused on the workshop as a space to forge new friendships and a safe space to discuss their concern for the environment without fear of judgement. Six participants mentioned finding like-minded people with whom they could share their worries about climate change as well as ideas for climate action, without feeling isolated for caring for this cause. While thinking of climate change provoked concern, identifying with their peers in the workshop elicited unison, empowerment, and optimism. Participants identified themselves as 'Climate Warriors'. They felt a sense of support, belonging, and connection as the group worked towards a shared purpose. This was exemplified in the excerpt below:

After coming here it gave me a sense that...people are also actually concerned about the climate and maybe

I'm not that weird, because I am portrayed as the weird one when I try to correct any unruly behaviour about climate...they laugh at me, but when I was here, I felt I belonged.

(Respondent 17)

4. Course correction: Areas of improvement

All responses in which participants shared key areas of improvement for the workshop were included in this theme. Six participant responses resonated with this theme. For regular workshop attendees, the high dropout rates posed the greatest difficulty – obstructing smooth coordination and delegation of tasks among group members and creating uncertainty around the final number of performers. To counter this, they offered solutions for future iterations of the workshop such as having an online group chat including the facilitator for higher accountability and increasing the gap between consecutive sessions within the same week. Additionally, participants also suggested the inclusion of a *research component* in the workshop wherein students engage academically and not just theatrically with the assigned topic. Finally, some participants suggested increasing the number of workshop sessions to amplify their impact. The following excerpt illustrates this theme:

If it [the workshop] is from one session on Monday and another session on Thursday there would be a gap of two or three days in between. So that will give people time to constantly keep thinking. What happened here was...we were thinking about this whole thing only for two [consecutive] days and then rest of the week...just forget.

(Respondent 19)

An additional insight from the focus group discussion was two participants' reportage of their aversion to negative emotions as a motivator for engaging in pro-environmental behaviour. Both participants discussed that forgetting to carry their tumblers to the university and being compelled to use disposable cups at the cafeteria elicited *guilt*. To avoid this negative emotion in the future, they resolved to become more diligent in remembering to carry out this environmentally friendly action. While this idea did not occur frequently enough to be regarded as a separate theme, it may have the potential to inform future iterations within this realm.

Feedback from the play audience

In addition to the data collected from workshop participants, 76 students responded to the audience feedback survey immediately after watching the play. 77.6% of the total respondents affirmed that watching the play sensitised them to the theme of climate change, while 22.3% were uncertain or denied any such outcome. 89.4% respondents reported that they enjoyed watching the performance and gave the play an above average rating. Approximately 84.2% of the audience reported a positive rating for the story (i.e., good or very good), and 90.7% did so for the message conveyed by the performance. When asked about individual and collective efficacy towards climate action, 96.3% and 95.3% respondents respectively reported better than average scores.

Discussion

This study focused on designing and testing an immersive theatre-based intervention to communicate the state of climate change to young adults in India, and tested its impact on variables of climate action. The study employed a mixed-methods design to assess the impact of the intervention, participants' beliefs on matters related to climate change, and their feedback for the workshop.

The quantitative data revealed significant gains on the scores on the NEP Scale, the GEB-50 Scale, and survey items on efficacy towards climate action. These results indicate the successful impact of the intervention in improving participants' attitudes towards the environment, their engagement in pro-environmental behaviours, and their sense of individual and collective efficacy towards climate action. These early findings supplement existing research on the promising potential of theatre-based participatory interventions. Theatre, as a modality, has been widely used to address issues of public health, such as access to reproductive rights (El-Dirani et al. 2023), countering the stigma around mental health conditions (Bacsu et al. 2022; Lee et al. 2022; Michalak et al. 2014), and shedding light on the health struggles faced by members of the queer community (Root 2021). This study acts as a step towards expanding the scope and impact of theatre to communicate a pressing global concern. Employing a participatory means, this intervention better explicates the social reality of climate change among youth as experienced and defined by them.

Participants' accounts of their experience of the intervention and its impact are summarised by the themes that emerged from the qualitative analysis of the focus group discussion conducted after the intervention. They emphasised the need for novelty in climate change communication while offering accessible, ascendable solutions to achieve

this end. This connects with the overarching aim of the study to innovate the modes and methods through which the climate crisis is conveyed within educational settings. Particularly within school and college contexts where climate change is taught within compulsory environmental education syllabi, this student-driven collaborative effort can help shape curricula in a context-informed manner. Jones et al. (2022) emphasise the importance of hands-on activities and community-building for climate change education in India, and the present study offers an exemplar for this.

Further, our participants reported an increase in their climate action efficacy and an incorporation of simple sustainable behaviours into their daily habits. These findings are corroborated by extant literature (Lam and Trott 2022; Law et al., 2021), wherein adopting an arts-based participatory strategy helped young participants realise their own impact on climate change and nudged them towards adopting pro-environmental practices. This is also mirrored by the feedback received from the audience members who affirmed the impact of the play in sensitising them to the issue of climate change through its narrative approach. Workshop participants emphasised the potential of university-wide initiatives in generating awareness and ensuring accountability from students. This is supported by Leal Filho et al.'s (2023) extensive review of literature, which acknowledged the significance of greater university engagement in efforts to address climate change locally and globally. They uphold the need for curricular reform, educational/awareness campaigns, and other recommendations to enhance the contributions of universities in this domain. Our findings also revealed how participants' engagement with theatre offered them an opportunity for personal growth, rejuvenation, and community building. This aligns with extant research (Keller et al. 2019; Lewandowska & Węziak-Białowska, 2023; Massó-Guijarro et al., 2021) that underscores the ability of theatre to extract personal narratives and facilitate interpersonal dialogue, while meaningfully addressing community-based concerns. This serves as a supplementary gain accrued from participating in a meaningful community-based activity embedded within an educational context. The cascading positive impact of such an intervention, extending from workshop participants to audience members, reinforces the ability of such an initiative to mobilize constructive action in the setting of a college campus.

Since this was a preliminary study that designed and tested a new intervention to influence young adults' environmental attitudes, pro-environmental behaviour, and climate action efficacy, it is crucial to recognize its limitations. This is widely documented in extant intervention-based pilot studies (Baños et al. 2014; Charbonnier et al. 2022; Ramstetter et al. 2023), and is also reflected in one of our qualitative data themes focused on participant feedback for 'course correction'.

Among the key suggestions offered by participants were practical solutions to control dropout rates and maximise the intervention's impact by optimising the dosage and frequency of sessions. Additionally, the research team ideated extensively to make note of challenges along the way, and possible modifications to ensure better outcomes for the future.

Limitations and future directions

As this is a pilot study and therefore a nascent step in a novel direction, we interpret its findings with caution. We present some of its limitations, along with recommendations for future research.

Firstly, the sample size was small, particularly at Time 2 ($n=20$) on account of challenges elaborated in the Methods section. Next, since the study was conducted within a single university, the demographic diversity within this sample was limited. The potential impact of attrition on the diversity of the sample was also not systematically examined. This compromises the generalisability of the findings. Involving students from other educational campuses, not just as participants but also as audience members, can help diversify the sample and widen the reach of the intervention. Additionally, participants were invited to self-identify their gender; however, all respondents identified within the male–female binary. This limits the inclusivity of our findings. We also acknowledge the gender imbalance in participation and stress the need for future research to actively incorporate more inclusive approaches to gender identity and expression. Further, a randomised trial involving a control/waitlisted control group comprising students from comparable contexts could strengthen the methodological rigor. Control participants may be administered the data collection measures while being engaged in their usual routine, sans intervention exposure. Future research may also include more robust data collection measures for audience members to better understand the spillover effect of such an intervention.

As is the case with community-based studies of this nature, participants were self-nominated and therefore likely to be already invested in the cause. While this may have aided participant commitment to the intervention, subsequent trials can adopt greater rigor in selecting a randomised sample. Next, the study relied on self-report measures, making the responses subject to social desirability. A more nuanced data collection tool, such as experience sampling using emotional and ecological momentary assessment, could help address these gaps. Future studies could adopt more advanced analytic methods and examine the interaction among variables of interest such as the NEP Scale (e.g., anti-anthropocentrism, anti-exemptionalism, etc.) with sub-factors of efficacy. This would go a long way to establish a more robust understanding of the impact of the intervention.

We also acknowledge, in congruence with related studies (e.g., Law et al., 2021; Logie et al. 2019), that the attitudinal

and behavioural changes generated by this intervention may be short-term. Follow-up data collection could help establish the scope of this intervention for long-term change.

The high attrition hampered the ability of the attending participants to assess the strength of the final performing team, which affected morale and confidence. We recommend introducing the intervention as a credit-based course to address this concern. This will act as an incentive for participants, bolstering accountability and increasing seriousness.

Additionally, while our study adopted a creative approach, there could be a greater focus of the workshop curriculum on regulatory and compliance aspects. Data points, economically relevant tools, global indices etc., can equip students to take on professional roles that demand working in conditions with rigorous environmental policies.

Despite the limitations and scope for improvement, the current study has promising implications for individual and collective stakeholders in the fight against climate change.

Implications

Students, both as workshop participants and audience members, are potential agents of change in incorporating and amplifying the importance of pro-environmental behaviours to their parents and peers. This fosters a culture of climate consciousness. Thus, educational institutions present themselves as an ideal ecosystem for harnessing the mettle of young people's individual and collective capabilities.

This newly designed theatre-based intervention comes about as a curricular module, fit to be utilised within educational settings to boost climate action efficacy among students. Its efficacy-oriented lens, combined with its component of knowledge dissemination, will equip students with the relevant skills and information needed to meet contemporary industry expectations. It also boosts their confidence to tackle a globally pressing challenge.

This intervention may be adapted to diverse cultural and educational contexts (schools and colleges), owing to its participatory paradigm and focus on amplifying individual and collective agency towards climate action. Facilitators could use the existing intervention module as a framework and tweak it to suit the developmental and contextual needs of the students involved. While the present trial was designed as an extra-curricular activity on account of the resources and logistics available to the research team, the program is flexible and adaptable to be delivered as a course with academic credits. Such implementation would require greater administrative buy-in, and procedural approvals. This could help minimise the problems of inconsistent attendance and participant attrition. On the downside, this may hamper students' intrinsic motivation that operates in case of voluntary participation.

A ‘train the trainer’ approach would be ideal to expand this program going forward. Collaboration with trained educators and theatre professionals could further enhance effectiveness. Structured facilitator training modules will ensure fidelity across diverse contexts, reducing the dependence on specially skilled facilitators. To sum up, we offer this intervention module as a resource suitable for adapting and implementing in education settings with varied needs. The focus on expected impact outweighs the concerns for mode of implementation. We believe that the users (educators, facilitators) would be best placed to select the appropriate manner for implementation in their own setting. Furthermore, the intervention is resource-efficient and scalable, important considerations if it must be accessible to the Indian milieu characterised by large student numbers, diverse educational contexts and relatively limited resources. When adapting and scaling the intervention, minimal resources are recommended. These include human resources (a workshop facilitator who has engaged with our training materials, a commitment of 3 to 4 h per week for four weeks from the facilitator and participants, consulting with theatre experts), venues (a safe rehearsal space that permits movement and expression for workshop participants, a well-lit and open performance space) technical support (speakers, microphone), incidental costs (printing certificates, recruitment posters and performance posters, stationery, refreshments for workshop participants).

The program can also be customised regionally and globally; due to the utilisation of forum theatre – a form that adapts to the context for which it is intended. The participant who plays the “joker,” a key element of forum theatre, must be skilled in handling unexpected situations and engage sensitively with challenging topics, while creating an inclusive space to receive a diversity of critical responses from the audience members. For these reasons, we recommend specific training in improvisational theatre skills – this can be done by employing improvisational theatre exercises as part of the four-week workshop (e.g., Yes And, Columbian Hypnosis, Blind Car, etc.). Building on the ‘train the trainer’ format, training the workshop facilitator to incorporate these elements into the workshop is an ideal starting point. This, however, is a good to have and not a necessity.

While forum theatre was our chosen modality, our primary goal was climate change communication and testing the impact of theatre- engagement on our workshop participants’ efficacy, attitudes towards the environment and pro-environmental behaviours. Thus, we adapted our strategy as we were working within logistical and practical boundaries of an academic term within a university campus. Our broad structure was derived from the forum theatre format, in that the protagonist in each skit found themselves in a problem-trap towards the end, and the audience was asked to share their thoughts imagining themselves in the character’s shoes. As the workshop participants did not wish to discomfort their

peers in the audience, they decided that they would like to ask audience members for suggestions, rather than having them transform to spect-actors within limited time. We integrated this suggestion, owing to the co-creative nature of the workshop. On the day of the performance, audience members offered solutions, which were incorporated into the play, and the skits re-enacted to alter the outcomes that the protagonist met with. This interaction was led by the joker – thus, forum theatre was chosen to introduce a problem, outline a lack of efficacy, and confront it in a collective setting.

The present study echoes existing literature on the use of theatre as a tool for climate action – there is a growing body of evidence supporting this globally (e.g., Balestrini 2017; Christie et al., 2022; Olvera-Hernandez et al. 2023). We reinforce the cultural necessity for developing an intervention that is rooted in locally-driven narratives, influencing the perception and resilience towards climate change and action. By bringing the theatre performance into a public space like the campus cafeteria, rather than a closed auditorium, this study also employs the indigenous art form of street theatre. This form is commonly used to generate awareness of social issues in India (Hussain 2024), and this study aligns its utilisation to the contemporary global concern of climate change.


Further, this paper challenges the dominant discourse on climate change education that emphasizes bleakness and doom, and instead offers a *positive action-based lens* to address the issue. This solution-focused approach illustrates the importance of leveraging the strength of young people as agents of change, mobilising their individual and collective attributes. It seeks to address the vacuum generated by didactic approaches to climate change education by placing young adults at the helm – a cohort that is more vulnerable to the impact of climate change than older generations.

Conclusion

Climate change can no longer be conceptualised as an exclusively environmental concern. It is deeply entrenched in our social and psychological world. Particularly for young people, who stand to endure its consequences more than previous generations, it is crucial to embed agency and efficacy into the narratives we adopt to communicate climate change. The findings of this study demonstrate that theatre can be a pedagogical catalyst to spark greater climate action efficacy among young people and motivate them to adopt pro-environmental practices. It also acts as a site for personal growth, rejuvenation, and community-building. The participatory nature of this study underscores the importance of incorporating context-and-stakeholder-driven voices into the larger discourse on the climate crisis, and positions young adults as agents of change who have the potential to positively influence those around them.

Appendix

CALL FOR PARTICIPANTS: A PROJECT ON CLIMATE CHANGE!



ARE YOU
BETWEEN THE
AGES OF 18 AND
23?

DO YOU WISH TO BE
PART OF A
MOVEMENT FOR
CLIMATE ACTION?

ARE YOU A
RESIDENT OF
THE JGU
CAMPUS?

IF YES, THEN THIS CALL IS FOR YOU!

As part of our research project, we are looking for students who are willing to participate in a movement for ecological and social change!.

SELECTION CRITERIA

- Preferably undergraduate students
- Regular attendance on campus
- Can give a commitment of 3-4 hours a week outside of class timings

WHAT WILL THE PROJECT CONSIST OF?

A 4-week workshop (2 sessions per week) during Fall 2023, culminating in a theatrical production focused on climate change and climate action.

FOR ANY QUERIES, YOU MAY WRITE TO ANY OF THE FOLLOWING CONTACTS:

- Samreen Chhabra, Assitant Lecturer, JIBS at schhabra@jgu.edu.in
- Dr. Pulkit Khanna, Associate Professor and Executive Dean, JIBS at pkhanna@jgu.edu.in

WHAT DO YOU STAND TO GAIN?

- The chance to be an agent of change and contribute to a movement for environmental and social good
- The opportunity to receive a certificate upon successful completion of the workshop
- The experience of working in an original theatrical production

HOW TO APPLY?

Scan this QR code for the form to apply latest by September 16th, 2023, 5 PM.
Limited slots available!




Fig. 4 Visual for call for participants for the four-week workshop

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Data availability This study was approved by the Research Ethics and Review Board (RERB), O.P. Jindal Global University. All best practices pertaining to ethical protocols were followed. Data will only be made available on reasonable request.

Declarations

Competing Interests The authors have no competing interests to disclose.

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