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ARTICLE

Save the Bees and Save Ourselves: Young People's Cli-Fi as Normative Myths of the Future

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Abstract
We co-designed a bee sequence with a specialist primary science teacher at an Australian government school. Year 6 students learned about European honeybees and Australian native bees, including through Cli-Fi. In this paper, we explore the pedagogical power of providing students with opportunities to create Cli-Fi about bee futures in the Anthropocene. We present and thematically analyse examples of students' bee Cli-Fi to argue that they generated these narratives to express how we ought to value bees and how we ought to conduct ourselves towards bees to realise more desirable futures. We propose that these students were futuring as normative myths. Students generated dystopian views of bee futures in adopting a human perspective, but also present were glimmers of hope for a more positive outlook that embraced more-than-human perspectives. We adopt a pragmatist semiotic approach to propose that these young people's bee Cli-Fi constituted normative claims about the future of bees, as they outlined the aesthetics (how and what we ought to value) and ethics (how and in what way we ought to act) of humans caring for bees in an epoch of polycrisis. We suggest that Cli-Fi ought to be an integral part of climate change education in empowering students to assert their agency.

Keywords: Cli-Fi; Anthropocene; bees; science education

Bees in the Anthropocene

We are currently living the epoch of the Anthropocene, as are all entities that make up the whole-Earth ecosystem. These are times and spaces of great suffering on a planetary scale; we are currently witnessing and participating in the sixth mass extinction (Cowie et al., 2022, Pievani, 2014). Humans have breached the planetary boundaries of Earth in almost (but not quite) irreversible ways (Rockström et al., 2009, 2024) through/as anthropogenic climate change. We, that is humans —and more specifically, white Western civilisation —have unleashed hydroclimate volatility on all our Earth kin, such that we wildly swing from droughts to floods and back again in an ongoing process of whiplash (Swain et al., 2025). We are not in crisis, but rather we are in polycrisis (Jørgensen et al., 2023)[1], as we struggle to come to terms with the socio-ecological challenges that cannot be easily resolved through the Industrial-driven techno-ingenuity of the Global North that got us into this mess in the first place (Head, 2018), and which disproportionately impacts the people of the Global South (Ogunbode, 2022) and in particular

[1]Jørgensen et al. (2024, p. 1) define polycrisis as: "... multiple interacting crises spanning the ecological, social, economic and technological domains."

First Nations people (Jones et al., 2024). As such, the issue of human-induced climate change is first and foremost an issue of climate justice for all (Sultana, 2022), and that necessarily includes our more-than-human kin (Verlie, 2021). And as we explore in this paper, education must serve a central role as part of these forces for climate-justice, including through/as creative narrative forms in our teaching and learning.

Bees are of course part of this tragic story. The history of the human-bee dynamic is long and varied, with a continuum of relationships (Andrews, 2019; Fraser, 2025). In some cases, bees serve human masters in exploitative relationships (e.g., colonialist mass-agriculture-dependent societies) (Ellis, 2023; Roffette-Salque et al., 2015), while in other cases, bees are kin with humans in familial relationships (e.g, First Nations people in Australia) (Hill et al., 2019; Nakagawa et al., 2025). But in all cases, bees of all kinds are critical to natural ecosystems, in particular as they pollinate local plants that enables the flourishing of these species and the rich biodiversity that is characteristic of healthy ecosystems (Patel et al., 2021; Katumo et al., 2022; Rhoades et al., 2013). Indeed, bees are super-sensitive indicator organisms that signal when ecosystems are in peril; at the moment the signs are deeply disturbing (Farias et al., 2023; Mair et al., 2023; Quigley et al., 2019). Bees are telling us very clearly, if we care to attune to them, that natural ecosystems are deteriorating due to lack of pollinators, as well as increased presence of pesticides and pathogens (Cunningham et al., 2022).

All of which can be linked to anthropogenic climate change, with bees severely impacted in immediate ways by the whiplash effect of hydroclimate volatility that plays havoc with their temperature-sensitive and seasonally-based being (Albacete et al., 2023; Soroye et al., 2020). Not only are solitary bees perishing but so too are whole colonies of bees; we are witnessing the eradication of entire bee communities across the globe (Batley & Hogendoorn, 2009; Zapata-Hernández et al., 2024). And by extension, due to the pivotal role that bees play in pollinating the food crops that feed human civilisations, we are facing the possibility of widespread famine in not just the Global South but also the Global North (Benjamin & McCallum, 2009; Jacobsen, 2008). Food security is now everyone's concern. Perhaps most profoundly, the honey that plays such a nourishing role—physiologically and spiritually —in so many human societies, but most especially for the bees themselves, is disappearing along with these unique insects (Kumar, 2024). A world without bees is no Earth at all, and that is a sad future.

Climate change education abuzz

As we continue to collectively endure the Anthropocene, we are realising the necessity to radicalise education in ways that maximise its transformative potential for young people and their adult-allies. The current situation is so urgent that any notion of sustaining the status quo is inconceivable, and we cannot continue to treat the problems of the Anthropocene as simply 'environmental' issues as this ignores the socio-ecological complexity of such challenges. We must draw on these rich educational traditions to enact something new, that is Climate Change Education (CCE), which acknowledges the interconnections between human systems and Earth systems (White, Ardoin, Eames & Monroe 2023; White & Ferguson, 2025). As science education activists, we are particularly motivated to explore CCE through the lens of science education and to really embrace these revolutionary potentialities (Ferguson & White, 2023).

As such, CCE for us is all about "Agency in the Anthropocene" (White et al., 2024, p. 117). This type of approach to education emphasises the competencies required by young people to realise their status as agentic citizens: "those with agency in the Anthropocene work individually and collectively with hope and efficacy to understand diverse perspectives on socio-ecological systems and to create a more just and resilient future" (White et al., 2023, p. 3). And, indeed,

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such an approach to education is endorsed by the Organisation for Economic Co-operation and Development (OECD) as reflected in the development of a Programme for International Student Assessment (PISA) *2025 Science Framework* that seeks to measure: "the degree to which 15-year-olds are knowledgeable of, concerned about, and able to act on environmental issues as a result of their science education" (White et al., 2023, p. 3). Such a framing of education explicitly acknowledges that "human impacts already have significantly altered Earth's systems, and they continue to do so" (White et al., 2023, p. 7). As such, what we mean by 'environmental issues' is really 'socio-ecological issues.'

Therefore, evidently there is global institutional recognition—as reflected in global assessment programmes —that the aim of science education, and we argue by extension CCE, is the development of young people's capacity to realise:

> . . . ways of being and acting within the world that position people as part of (rather than separate from) ecosystems, acknowledging and respecting all species and the interdependence of life . . . acknowledge the many ways societies may have created injustices and work to empower all people to contribute to community and ecosystem wellbeing . . . demonstrate hope, resilience, and efficacy in the face of crises that are both social and ecological (socio-ecological) . . . respect and evaluate multiple perspectives and diverse knowledge systems and demonstrate their ability to engage with other young people and adults, across generations, in civic processes that lead to improved community wellbeing and sustainable futures . . . work individually and with others across a range of scales, from local to global, to understand and address complex challenges that face all beings in our communities (White et al., 2023, p. 7).

As Monroe et al. (2023, p. 351) point out, "this change in the assessment has the power to alter the concepts and competencies to which science education attends in schools." It's important to remember that what often counts in education is that which is assessed, whether we like it or not, and so we need to ensure that what we value in education is part of these assessment agendas. Such changes in global assessment processes are a sign that we ought to be hopeful of converting potentialities into actualities in terms of reforming science education as part of CCE. However, young people are only able to meaningfully pursue this agency if they "believe that their actions will be appreciated, approved, and effective as they work to mitigate climate change, biodiversity loss, water scarcity, and other complex issues and crises" (White et al., 2023, p. 7). All of which is to say that agency in the Anthropocene is first and foremost a matter of education (White et al., 2023), which necessitates that we "dare to think differently about education" (White et al., 2023, p. 27). In particular, there is a need to invest in exploring and welcoming a post-anthropocentric education (Stiegler, 2018) that situates more-than-human kin as central to education processes (Poelina et al., 2022, 2023; Wooltorton & White, 2024).

Climate change education for/as Cli-Fi

In 2008, Dan Bloom coined the term "Cli-Fi" to describe the particular form of speculative fiction that concerns the possible Earth futures playing out as a result of human induced-climate change (Wright, 2019). And seventeen years later, we are immersed in Cli-Fi in a plethora of forms, from written texts to films/TV shows to stage productions and more. Of course, Cli-Fi existed as a narrative form long before Bloom termed it thus, and indeed all societies across the globe engage in such futuring (Williams, 2023) even if they term it otherwise. And now that we also have a

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multifaceted term to articulate our seemingly inevitable impending doom—the "Anthropocene"—then we can consider Cli-Fi as a critical component of efforts to realise the "Neganthropocene" (as Steigler terms it, 2018) that is a hopeful more-than-human alternative to our current anthropocentric trajectory. It is in this way that Cli-Fi may function to support young people to "learn-to-live-with climate change" (Verlie, 2019, p. 752) as they can affectively and noetically speculate about humans being differently with other entities on Earth (Ferguson, 2024), including bees (see Maya Lunde's *The History of Bees* as an example of bee Cli-Fi). And part of this potential therapeutic function of Cli-Fi is supporting individuals and communities to engage with their eco-emotions —in particular increasing eco-anxiety in a burnt and flooded world —in ways good for humans and far beyond (Hennessy et al., 2024; Malecki et al., 2025).This is Cli-Fi as a driver of agency in the Anthropocene, and importantly these are not always stories of utopia, for dystopic impressions of the future can also empower young people to realise their citizenship of (local, national, international), communities, today and tomorrow.

We agree with Young (2022) that Cli-Fi ought to constitute a key part of CCE as part of efforts to embrace the power of participatory storytelling in CCE to empower students to enact more-than-human futuring in agentic ways (Ghajargay, 2025; Heinemeyer et al., 2024). As science educators, we concur with Milner and Bergmann (2020) that Cli-Fi at least some of the time needs to address climate science in an explicit way. Young people need to be provided with opportunities as part of their education, including CCE-infused science education, to create and share Cli-Fi as they come to terms with the Anthropocene via futuring (Cork et al., 2023; Jukes et al., 2024). However, research is required to explore and determine the pedagogical entailments of such Cli-Fi work for both teachers and students, which is the primary focus of our paper that embraces the need for humans to better love bees, via caring conduct, as more-than-human kin. CCE is constantly evolving and if we are striving to be innovative science educators then we need to contribute to efforts to understand the place of Cli-Fi as part of such science education. Saving the bees to save ourselves may well depend on us working with teachers and students to do CCE in this Cli-Fi way.

Enacting climate change education in the Anthropocene

Our work with teachers, students, and bees is part of the project *Enacting Climate Change Education* that seeks to infuse climate change related content and processes into science education through links with contemporary science and scientists. We have worked with teachers via a design-based research process (DBR) (Tytler & White, 2023) at primary and secondary schools in Victoria, Australia to design and implement science lesson sequences that support students to engage critically with the socio-ecological challenges of the Anthropocene as part of the development of their agentic citizenship (Tytler et al., 2024). This approach is underpinned by a guided inquiry pedagogy (Kirk et al., 2023) that priorities teachers supporting students to work flexibly with various semiotic forms (i.e., multimodality) to reason in collaborative ways about scientific phenomena. Topics explored in these sequences include: bees, hydrogen energy, natural disasters, frogs, light and vision. Each sequence is connected to the curriculum and was developed in an iterative process, such that adjustments to pedagogy and content were made based on teacher and student input.

We designed and implemented a seven-lesson bee sequence with Year 5 and Year 6 teachers and students in 2023 and 2024. The sequence concerned three main themes: bees as kin, biology of bees, and socio-ecology of bees. The lessons consisted of various activities in which students were hands-on and minds-on working in groups to explore the world of bees in the Anthropocene through various representational forms. For the purposes of this paper, we focus on a version of

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the sequence run with three Year 6 classes (30 students in each class) in 2024 that included a Cli-Fi element that was not part of previous iterations. The motivation for including this Cli-Fi element was to increase the potential for students to agentically engage with the ideas and processes of the sequence concerning science and climate change. All lessons were taught by Maya, the science specialist teacher at the Melbourne school, who was familiar with the guided inquiry approach.

The Cli-Fi challenge occurred at the end of the lesson sequence as a culminating event and involved the students firstly exploring, through a variety of media, the impacts of climate change on European Honeybees in Greece (in particular more intense and frequent bushfires) and the impacts of climate change on endemic bees in Australia (in particular Green Carpenter Bees, on Kangaroo Island off the coast of South Australia, who were recently impacted by devastating bushfires). The students were then provided with an overview of the meaning of Cli-Fi and informed that they were going to create their own Cli-Fi to advocate for bees. They were then presented with this prompt:

> *European Honeybees and Green Carpenter Bee populations are in trouble in Australia – so what are YOU going to do about it? Write a climate fiction story from the bees' perspective. This can be either utopian (best case scenarios) or dystopian (worst case scenarios). Make use of your new scientific understandings of bees to come up with your creative story that advocates for bees.*

The students were provided with some possible strategies to follow in enacting this Cli-Fi: choose a media form (written, video, audio etc.); include a beginning, middle, and end to the narrative; choose a dystopian or utopian focus; and define characters and the plot. Students had two lessons (of fifty minutes each) to plan for, create, and share their Cli-Fi. In this paper, we respond to the research question: *Can Cli-Fi be a useful pedagogy to explore futuring as part of CCE-infused science education?*

Working with Cli-Fi as data

We adopted a Peircean pragmatist semiotic (1894/1998, 1907/1998) approach for generating and engaging with data to make our claims about the pedagogical value of Cli-Fi as part of CCE-infused science education. The semiotic element here concerns considering the students' Cli-Fi creations as semiotic constructions consisting of different sign forms that enable the students to communicate their particular messages to peers as part of meaning making as futuring. As such, this Cli-Fi is open to interpretation and analysis as representations, with these Cli-Fi as signs always to a degree general (up to the interpreter to supply further determinations of meaning) and vague (up to some other possible sign, and not the interpreter, to complete the determinations of meaning). While the pragmatic element here concerns the three normative sciences of aesthetics (how and what we ought to value), ethics (how we ought to conduct ourselves with what actions), and logic (how we ought to think about what ideas) (Peirce, 1903/1998).

Data was collected in the form of photographs and digital scans of students' written/drawn Cli-Fi as well as video/audio of the performative Cli-Fi, and in some cases video/audio of the students reading aloud their written/drawn Cli-Fi. Students were also asked about Cli-Fi as part of their audio-recorded focus group interviews at the end of the sequence. As the focus of this paper is on the students' Cli-Fi as semiotic artefacts and this constitutes a preliminary stage of our bee Cli-Fi investigations, we only make use of the photographs and digital scans of students' written/drawn Cli-Fi for the purposes of a consistent thematic and semiotic analysis. However, in the future we plan to also explore students' audio-visual Cli-Fi and their discussions/explications of their

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creations on-the-spot in the classroom and for the end of sequence interviews, in order to enrich the picture we paint of student's narratives and create time and space for these students' voices.

For the analysis there were a total of 27 Cli-Fi artefacts included from two of the Year 6 classes, that is 27 of a total of 29 Cli-Fi artefacts (93%). The Cli-Fi artefacts from the third class were not included due to issues with the digital technology used to collect and organise this data, which made it unworkable to analyse these student artefacts in a way commensurate with the methodological rigour of our analysis process. Data analysis was thematic in nature using both deductive and inductive means (Braun & Clarke, 2006, 2022; Clake & Braun, 2016) that played out in an iterative process. Joseph undertook this deductive and inductive analysis process and then met with Peta to cross-check the coding through a collaborative process, that wove together critical insights as independent evaluations of these codes.

For the deductive analysis, students' Cli-Fi was initially analysed in terms of predetermined codes: narrative form (story, cartoon/comic, poetry, play); outlook (dystopian or utopian or both); perspective (bee or human or both). These codes were determined based on the way the Cli-Fi task was set up for students by the researchers and Maya, which was based on our understanding of the role of Cli-Fi in CCE (and as part of the bee lesson sequence in particular). In undertaking this process, some student Cli-Fi (2 of the total of 29 student Cli-Fi artefacts, that is 7%) was excluded from the analysis as it was not aligned with expectations of Cli-Fi in the context of the research, more specifically not exploring the futures of humans and bees in a climate changed world. This deductive coding of the students' artefacts enabled us to make some claims about the nature of the students' Cli-Fi in terms of narrative form, outlook, and perspective.

In terms of the inductive analysis, the plot of the Cli-Fi narratives was described and then patterns in the narratives (at a more fine-grained level of detail than the overall plot) were determined that reflected the perceived communicative intent of the students' Cli-Fi. This way of analysing the students' artefacts is methodologically justifiable on semiotic grounds, as we positioned the students' narratives (with the students as sign-makers) as their communications about possible human and bee futures that they put out into the world to be interpreted by others, which includes us as sign-receivers. We propose that this process of interpretation, even though not inclusive of students' own interpretations of their own creations, was still sensitive to the students' communicative intentions as we shared with these students a common language about bees, humans, and Cli-Fi as we worked closely with them and Maya for the duration of the lesson sequence. As such, the students' narrative creations partly emerged from their interactions with Maya and ourselves, which is the case with any representation in that sign making and sign reading are always a collective undertaking. Indeed, we argue that Cli-Fi in the science classroom ought to always involve teachers working alongside students to support them in futuring in desired ways. In this way, the narratives of the students' Cli-Fi could be considered through the lenses of both aesthetics and ethics. Aesthetics was relevant as students seemed to express concern in their narratives about how we ought to value bees, and ethics was relevant as students seemed to then also express concern about how we ought to conduct ourselves towards bees (based on these values). Logic also plays a role in our analysis but in a secondary way, in that we consider the aesthetic and ethical nature of students' Cli-Fi as partly reflecting the knowledge with which the students engaged (or did not engage) with over the course of the sequence. In addition, we position these understandings as partly emerging from students' aesthetic and ethical stances in relation to bees and their human allies. In this way, we are able to say something meaningful about how students ought to think about bees, with future work needing to unpack how the students themselves think we ought to think about bees.

In this paper, we provide some simple descriptive statistics about students' Cli-Fi as derived from the deductive analysis, as well some examples of students' Cli-Fi as informed by the inductive analysis. We present selected examples of artefacts to exemplify the aesthetic and ethical aspects of students' Cli-Fi. As such, we explore themes/patterns at different levels; 1) in relation to specific

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content of narratives as revealed by deductive codes 2) in relation to normative framing of narratives as revealed by inductive codes.

Save the bees & ourselves

In terms of the narrative form of the Cli-Fi: 11 students constructed comics; 14 students constructed stories; while one student constructed a play, and one student constructed a poem. In this way, students seemed to prefer text-based Cli-Fi stories, but also embraced opportunities to make use of pictorial forms (as comics) to construct narratives. It is noteworthy that the play form and poetry forms were taken up by some students, even if this was only one student in each case, which emphasises the need to provide students with multimodal opportunities to construct and share their futuring as/through Cli-Fi.

In terms of the outlook: 27 students (that is all the students!) expressed dystopic futures and so no students expressed purely utopic futures, however the dystopic futures of 13 of these students were lined with a glimmer of hope (as such they were full of utopic potential). In this way, students seemed to default to a dystopic futuring process as they focused on human-induced climate change impacts on bees, but with the depressing nature of this outlook serving to highlight hopeful potentials (the silver utopic lining of the dark dystopic cloud). As such, for these students, there is hope in misery. The complete absence of outright utopic narratives is confronting, but perhaps not surprising considering these students are of a generation that has always experienced the climate as human-induced climate change.

In terms of the perspective: 20 students adopted a purely human perspective; four students adopted a purely bee perspective; while three students adopted both a human perspective and bee perspective. The dominance of the human perspective is to be expected considering the anthropocentric nature of Western schooling in Australia and indeed much science education (with our DBR work trying to shift this paradigm). However, the presence of combined bee and human perspectives as well as solely bee perspectives in these students' narratives goes to show that these students are capable of decentring the human from futuring, and positioning more-than-human (including bees) as integral to such narratives. It is not possible to determine for sure, but the emphasis on more-than-human perspectives in the bee lesson sequence may have played a role in the perspective adopting of these students, as likely combined with other aspects of these students' experiences (e.g., cultural beliefs of them and their families).

With these findings from deductive analysis in mind, we can now present the main themes that seemed present in the Cli-Fi constructions of the students as enabled by the inductive analysis. We frame these themes in terms of students' aesthetic (values) and ethical (conduct) claims. Many of the narratives concerned the detrimental impact of human-induced climate change on Earth, and the consequent extinction of bees, with humans having to take extreme actions to survive (e.g., living underground, procuring alternative food sources). In most cases, students did not detail the specifics of these human-induced climate change impacts, but rather presented these impacts as a general threat. And if they did provide more specifics, this tended to be related to what they had most recently learned in class (e.g., more frequent and intense bushfires that destroy bee colonies and habitats). In addition, students were vague in terms of the specific type of bees that were dying out, as in whether they were European honeybees or native Australian bees, but in most cases they seemed to focus on European honeybees (as indicated by the behaviours they attributed to their bee characters). Perhaps this neglect of native Australian bees is reflective of a European honeybee bias that is linked to students primarily considering bees in relation to human agriculture. Again, this bias was counteracted by the emphasis on Australian native bees in the

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lesson sequence, but perhaps this was still not sufficient to properly disrupt students' preference for European honeybees.

A common aspect of these narratives was an intergenerational element in that the students temporally positioned themselves (or their narrative alter egos) relative to younger or older generations (e.g., a grandparent telling a child about earlier Earth days when bees were present). It is evident that most humans featured in these narratives are mourning the loss of the bees, and this loss often is framed in terms of the utility of bees to enable mass food production for humans. As such, students are valuing the bees in anthropocentric terms; the value of bees to enable lots of people to acquire sufficient food to live their chosen lives. However, it is noticeable, albeit in some cases subtle, that students also wanted to communicate that the demise of the bees is an existential loss. In other words, the absence of bees on Earth is a loss of quiddity; the essence of bees is no more, and so Earth is fundamentally worse off. As such, students are valuing bees in a more-than-human way; the value of bees in and of themselves, as part of the lifeforce of Earth.

In both cases—the anthropocentric and more-than-human valuing of bees—it is apparent that students put forward an imperative to save the bees via actions of redemption (i.e., humans are directly responsible for the extinction of bees and so they must take the actions that can save the bees). While students in these cases often do not articulate the particulars of these actions that can address specific human-induced climate change impacts, it is evident that they demand that humans must take some sort of action that will raise bees from the dead. Importantly, these actions are framed as redemptive by these students as they construct their narratives to make clear that in saving the bees that humans can also save themselves (and make up for their bee-killing sins). And this redemption is not just in a physiological sense but also in a spiritual sense, in that humans can take their existential place alongside, and not above or below, more-than-human kin. In this way, bees for these students are sacred while humans are profane; bees are the saviour than can elevate humans to sanctity. However, this redemptive potential of humans is in some narratives never actually realised in the students' Cli-Fi, with these students suggesting that humans may need to suffer some more (i.e., honestly come to terms with their anthropocentric ways) before they are worthy of rising again.

We present below a selection of some student narratives, for each of which we provide a description of the narrative as well as the form, outlook, and perspective. In presenting these examples of student's Cli-Fi, we want to give direct presence to student voices in our paper and to support the reader to appreciate the aesthetic and ethical nature of these narratives. We note that while it is not possible to determine with certainty, we suggest that in all these examples that when students refer to "bees" they mean "European honeybees."

Katie

Katie and her peers (Rebecca and Chantelle) created two possible plays (Figure 1) with similar but slightly different narratives which concerned the death of the final bee (due to unspecified human impacts) and its potential to rise as a divine being and save humanity. They adopted a human perspective as framed by a dystopic outlook but with potential for hope through honouring bees.

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Scene one, climate change begins.

narrator: Climate Change has destroyed the earth, [redacted] crippling the bees, and only a few thousand are left. The scene is set in a market, where everyone is buying their food.

Crazy woman: The world is ending! save yourselves! Run! Fly! Do anything! *Runs through market* There are only a few thousand bees left.

narrator; 20 years later

narrator: 20 years later, the world is barren, and there is only one bee left; gasp.

Crazy woman: [redacted] *prays* Please help us bee, don't die!

*Bee comes back to life reincarnated as god

Mean Woman: Beer are important!.

Scene one

Narrator: The world is slowly dying, and there are only a few thousand bees left, Ria is the only one aware of the situation, but nobody else listens, the scene is set with Ria running throughthe market, attempting to inform the rest of the world of the danger.

Ria: *Running through market* The world is ending! There is only a few thousand bees left!

Keira: *Playing concentation with Kayla*, your so weird! Go away!

Narrator: 50 years later, the world is barren and there is only one bee left, the scene is set where two people are looking for food.

Ria: [redacted]. Hey look, the last bee on earth! We must save it!

Charllote: Buzz Buzz Buzz

Keira: *pushes bee over and steps on it* Suck that! We don't need bees!

Ria: Noooooo! The last bee! We need the bees because erm actually without the bees we will run out of food within a [redacted] four years! Were gonna die!.

Figure 1. Katie's (and Rebecca's and Chantelle's) Cli-Fi plays.

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Cheryl

Cheryl created a story, written as diary entries (Figure 2a, b), which involves siblings separated over time and the way this society experienced the loss of bees (as entwined with the collapse of all Earth ecosystems) and that these people yearn to bring back the bees and save them with a focus on the possibility of a last remaining bee that could save humanity from itself (but humans have to save this divine bee first). Cheryl adopted a human perspective as framed by a dystopic outlook but with potential for hope through saving the final bee.

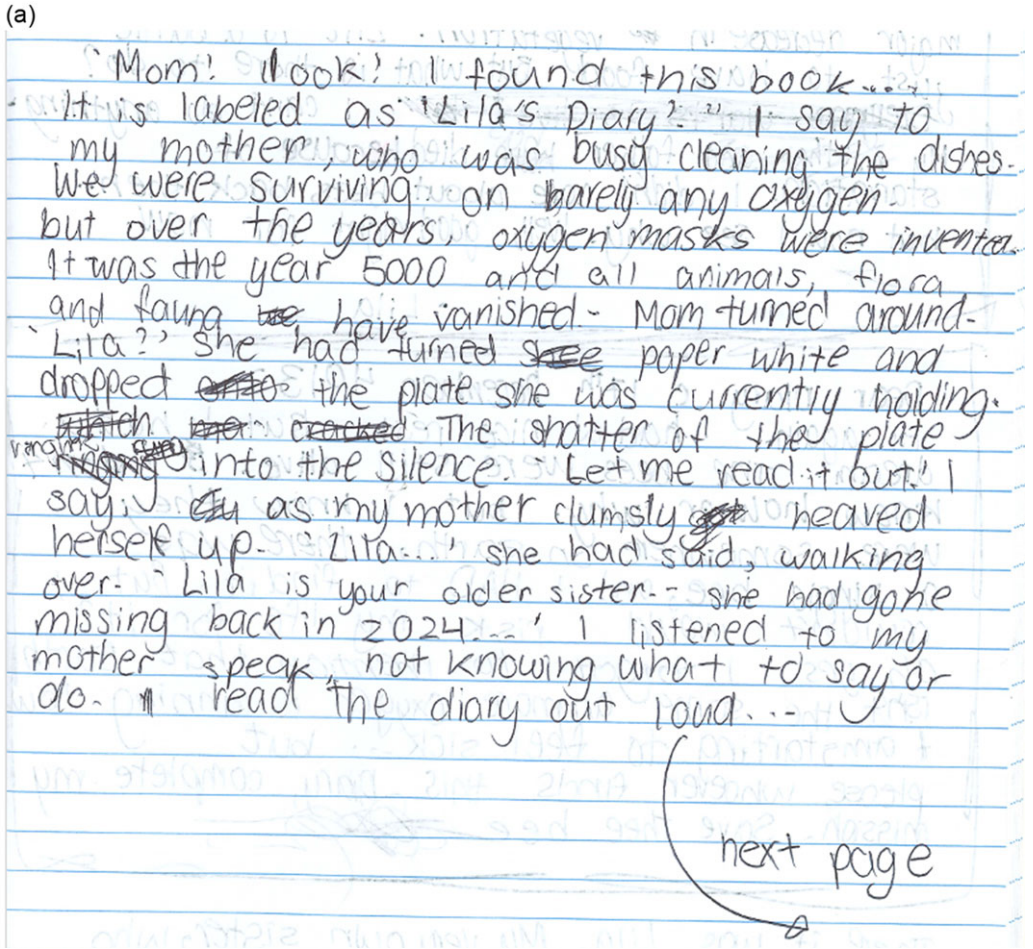

Figure 2A. Cheryl's Cli-Fi story (as diary entries).

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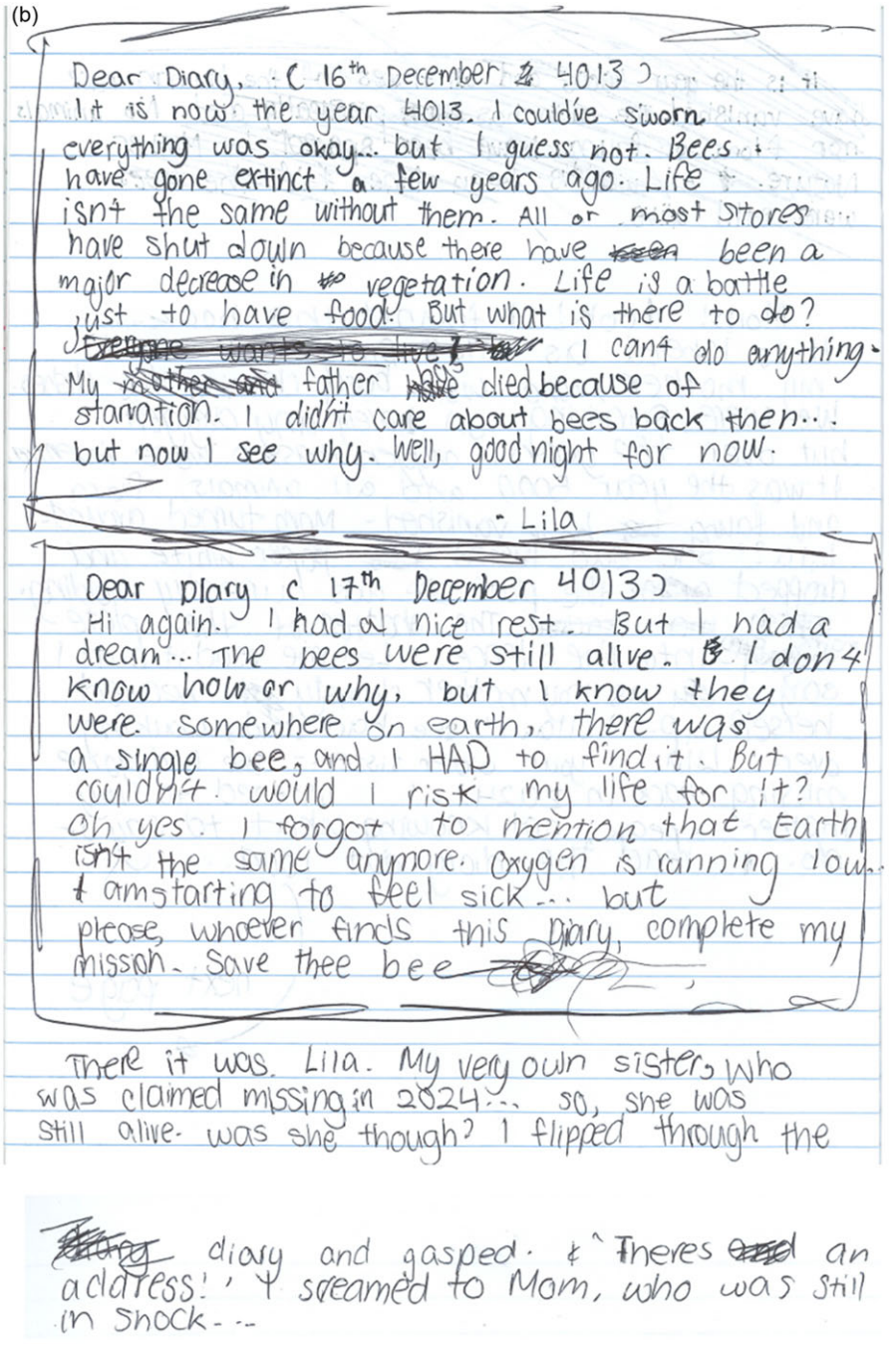

Figure 2B. Cheryl's Cli-Fi story (as diary entries).

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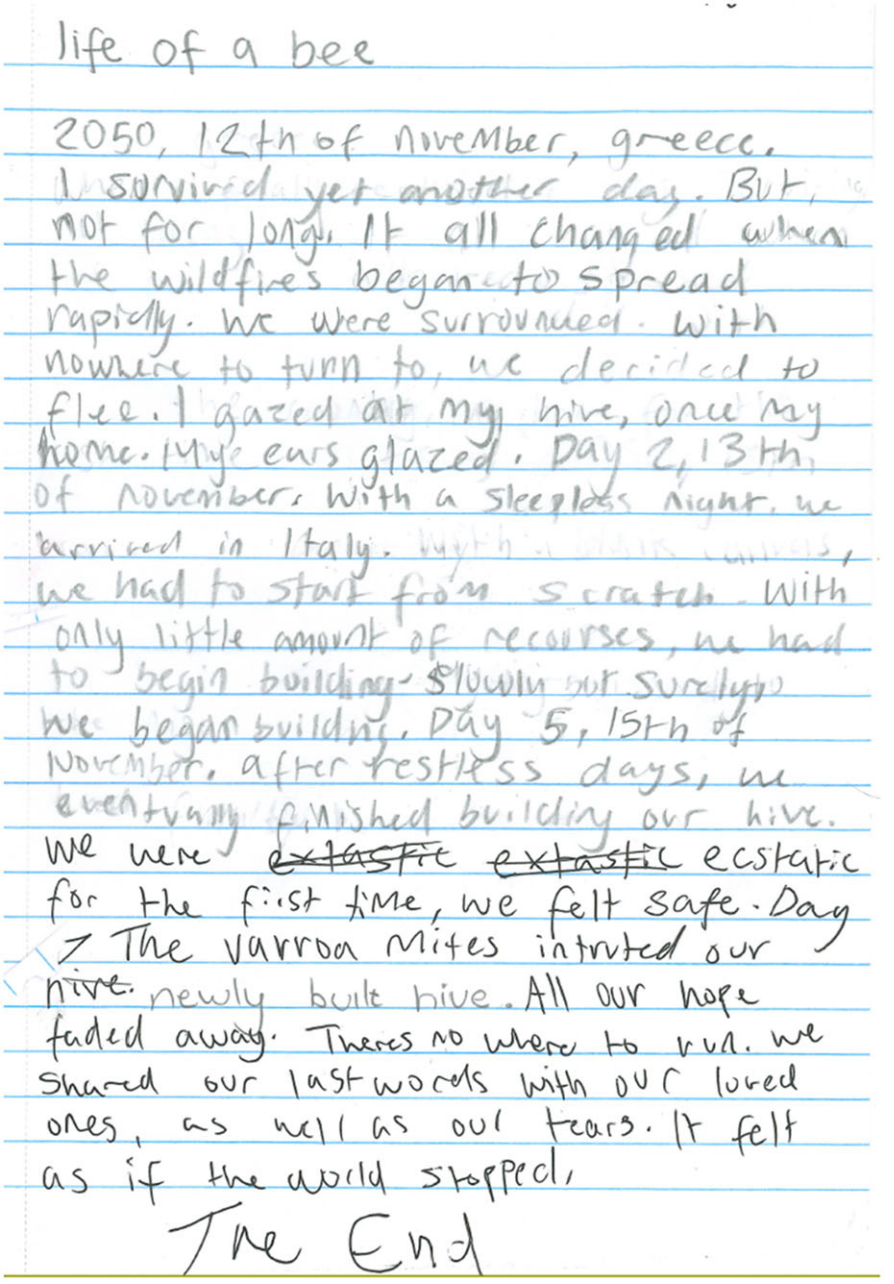
Anand

Anand created a story, written as diary entries (Figure 3), in which bees flee a wildfire in Greece (presumably caused by humans) and set up a new hive in Italy, only for varroa mites (presumably caused by humans) to destroy this new home and the bee's hope for a desirable future. Anand adopted a bee perspective as framed by a dystopic outlook, with no evidence of hope in the form of humans changing their ways to save the bees.


life of a bee

2050, 12th of November, greece.
I survived yet another day. But,
not for long. It all changed when
the wildfires began to spread
rapidly. We were surrounded. With
nowhere to turn to, we decided to
flee. I gazed at my hive, once my
home. My eyes glazed. Day 2, 13th
of November. With a sleepless night, we
arrived in Italy. With
we had to start from scratch. With
only little amount of recourses, we had
to begin building. Slowly but surely
we began building. Day 5, 15th of
November. after restless days, we
eventually finished building our hive.
We were ~~extastic~~ ~~extastic~~ ecstatic
for the first time, we felt safe. Day
7 The varroa Mites intruted our
hive. newly built hive. All our hope
faded away. Theres no where to run. we
shared our last words with our loved
ones, as well as our tears. It felt
as if the world stopped,

The End

Figure 3. Anand's Cli-Fi story (as diary entries).

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Reece

Reece created a comic, Figure 4, in which a human lights a fire that alarms the bees, and they go back to their hive to tell the rest of the colony, and then the fire spreads, and then further in the future all bees (sacred) are gone with the human perpetrator (profane) sentenced to prison for their bee-killing sins. Reece adopted a human perspective but also a bee perspective, as framed by a dystopic outlook, with no evidence of hope in the form of humans changing their ways to save the bees.

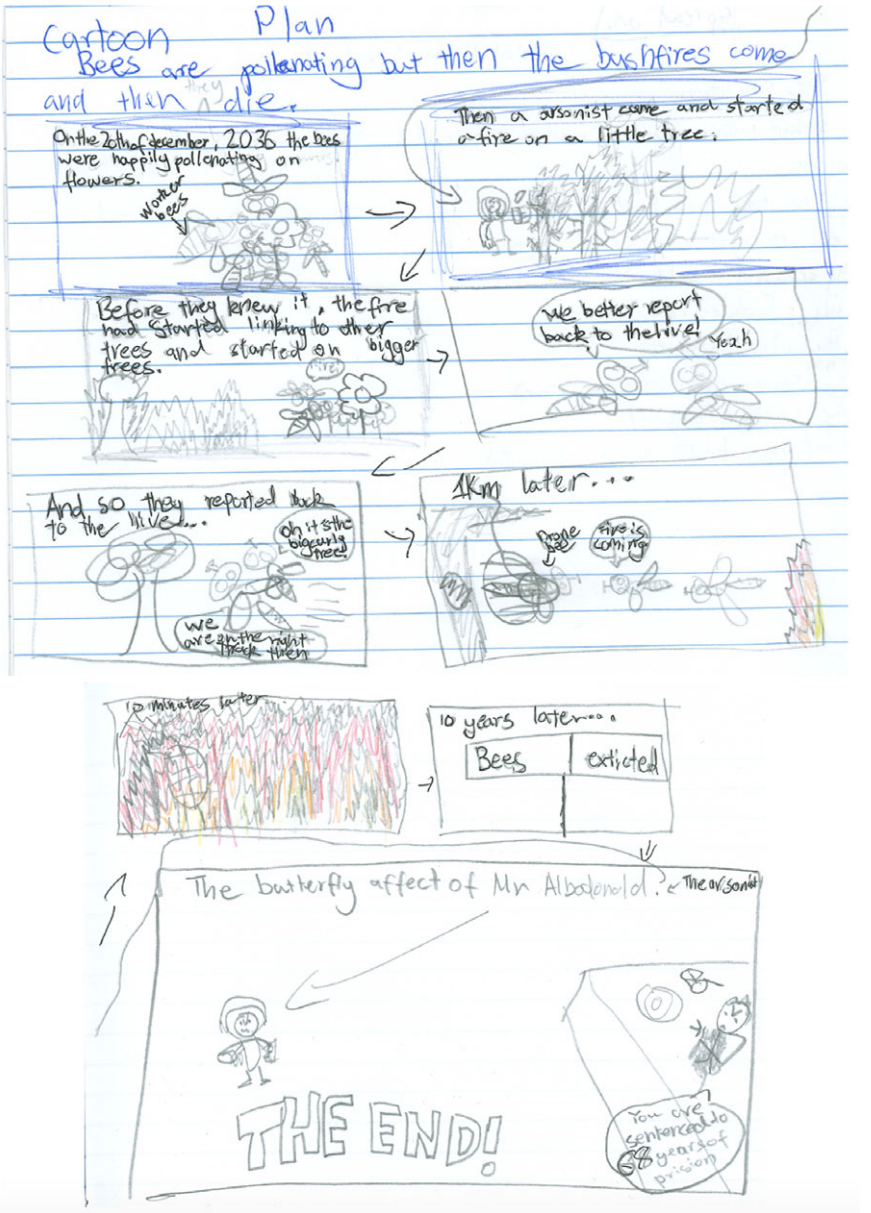

Figure 4. Reece's Cli-Fi comic.

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Helena

Helena created a poem, as a series of haikus (Figure 5), in which human (profane) impacts on Earth (unspecified) lead to the extinction of bees (sacred) (due to lack flowers from which to collect pollen as a food source) with an explicit message to humans to save the bees and in doing so save themselves. Helena adopted a human perspective but also a bee perspective, as framed by a dystopic outlook but with potential for hope by caring for bees as humans care for themselves.

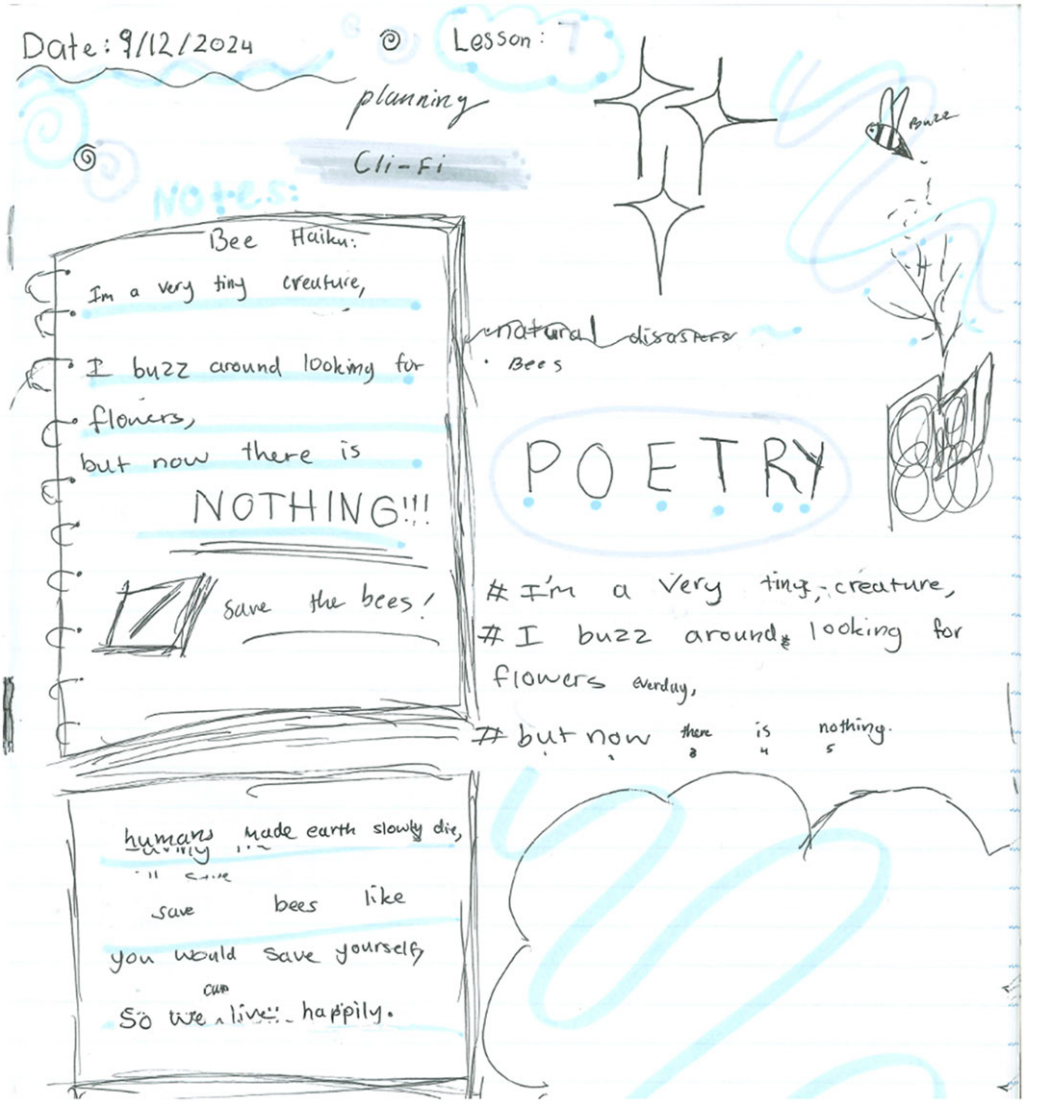

Figure 5. Helena's Cli-Fi poems.

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Young people's Cli-Fi as normative myths of the future

In returning to our research question—*Can Cli-Fi be a useful pedagogy to explore futuring as part of CCE-infused science education?*—in simple terms we can answer in the affirmative. In exploring the students' narrative creations through the lenses of aesthetics and ethics, we suggest that this Cli-Fi enables students to explore humans' valuing of bees and the links with what actions these values lead to in relation to bees. In this way, through the Cli-Fi, students were able to present particular value statements that entail certain ethical imperatives, more specifically in terms of humans loving bees and the caring conduct this then demands of humans in relation to bees. In other words, more-than-human futures. We argue that students presented these narratives not in suggestive terms, but rather in normative terms; as in, this is the way in which humans *ought* to value bees and conduct themselves towards bees. WE (HUMANS) MUST CHANGE OUR RELATIONSHIPS WITH BEES; WE (HUMANS) MUST RELATE TO BEES AS KIN. We propose that these students' Cli-Fi are therefore normative myths of the future (Boschetti et al., 2016; Dege, 2023; Patton, 1999), a particular manifestation of normative future visioning (Comelli et al., 2024). These student narratives are epic in thematic scope as they position humans as profane beings who can only redeem themselves from their bee-killing sins by saving the sacred bees who have the divine power to in turn save humans. By framing the students' Cli-Fi in this way, we can appreciate the general nature of the students' narratives and the lack of specificity, as the point of myths is not to narrativise particular individuals and their experiences, but rather to communicate aesthetic and ethical messages about the human condition (in relation to other organisms). Of course, this is not to ignore the way these students often included themselves and families as part of the Cli-Fi, but rather to highlight that in doing so the students were presenting themselves and loved ones as symbolic of humanity in general.

It seems to us that the utopian and dystopian outlooks of the students' Cli-Fi do not fundamentally change the nature of these normative claims, in the sense that even the purely dystopic narratives are a message about humans needing to lovingly value bees and conduct themselves caringly towards them. However, we argue that a more dystopic outlook compared to a more utopic outlook does indicate a stronger focus on the impacts of human-induced climate change by these students, which may potentially limit their capacity to engage in more positive futuring. As such, teachers need to work with students to better understand and appreciate climate science, which can empower students to think beyond just the impacts of human-induced climate change to framing their futuring in terms of the relationships between human systems and Earth systems. We propose that this is a matter of logic in a Peircean sense, in that this is the way in which students ought to think about humans' connections with bees. It would seem to us that students' Cli-Fi that is not just aesthetically and ethically but also logically focused on humans being-as-kin with bees is likely to constitute narratives of futures that are more desirable for all, as partially grounded in climate science (in addition to other ways of knowing, including First Nation Peoples' perspectives).

We similarly propose that the form of the students' Cli-Fi—whether comic, play, poem, or story—does not seem important for the nature of the students' claims, as in each case they are normative statements. But having said this, we point out that it is essential to provide students with the choice of Cli-Fi form as each student is likely to be able to most effectively communicate their normative claims in a preferred form. In terms of the perspectives adopted by the students in their narratives, it is apparent that both or either of the human perspective and bee perspective are capable of setting up normative claims that humans must value bees in both a utilitarian and existential sense, and in both cases act to ensure the health of bees. However, it seems likely that even if a student does not adopt a bee perspective in their narrative that they would greatly benefit from engaging with peers' Cli-Fi that does prioritise these bee perspectives, as such perspectives more greatly demand more-than-human futuring.

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As science educators who are dedicated to supporting young people to realise agency in the Anthropocene, we posit that CCE-infused science education needs to involve teachers working with students to create and share normative claims. In this way, we can talk of normative agency (Kennett & Matthews, 2008; Laitinen, 2022), which we position as part of agency in the Anthropocene. Students who are able to effectively communicate what ought to be, are students who feel they can make a difference in matters that matter to them and their communities. We further suggest that Cli-Fi as narrative, and more specifically as myth making about the future, is a powerful means for students to undertake such normative work. And more than this, we are hopeful that such Cli-Fi can foster students to decentre humans from their world views and instead position humans alongside (not above or below) other Earth entities; this is all about more-than-human futuring. As we have shown in this paper, saving the bees for young people is at least partly a matter of making myths about futures of humans and bees saving each other as kin, but with this transformation dependent on humans firstly realising that they need redemption and then actively seeking to interact in positively transformative ways with bees. We propose that such Cli-Fi focused pedagogy need not be restricted to bees, but can be expanded to students futuring about other possibilities of Earth systems and human systems interacting in more desirable ways for all biotic and abiotic forms. We acknowledge that such a creative narrative approach may well be in tension with existing pedagogical expectations in science education, our focus here, but we argue that this just means that science education needs to change to reflect our Anthropocene times.

So, we conclude in a speculative and hopeful spirit—much like the students' narratives —by saying that Cli-Fi ought to be a central part of CCE-infused science education, as its normative nature in epic form is of the magnitude required for young people and their adult allies (teachers and researchers) to come to terms with the challenges of the Anthropocene and realise more desirable futures for humans and more-than-human kin. We encourage our education researcher colleagues, including in science education, to join us in fully valuing students' narrative creations as essential to appreciating students' epistemological and ontological experiences as core to their educational experiences in the Anthropocene.

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References

Albacete, S., Sancho, G., Azpiazu, C., Rodrigo, A., Molowny-Horas, R., Sgolastra, F., & Bosch, J. (2023). Bees exposed to climate change are more sensitive to pesticides. *Global Change Biology*, *29*(22), 6248–6260.

Andrews, E. (2019). To save the bees or not to save the bees: Honeybee health in the Anthropocene. *Agriculture & Human Values*, *36*(4), 891–902.

Batley, M., & Hogendoorn, K. (2009). Diversity and conservation status of native Australian bees. *Apidologie*, *40*(3), 347–354.

Benjamin, A., & McCallum, N. (2009). *A world without bees*. Penguin.

https://doi.org/10.1017/aee.2025.10057 Published online by Cambridge University Press

Boschetti, F., Price, J., & Walker, I. (2016). Myths of the future and scenario archetypes. *Technological Forecasting and Social Change*, *11*(1), 76–85.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101.

Braun, V., & Clarke, V. (2022). Toward good practice in thematic analysis: Avoiding common problems and be(com)ing a knowing researcher. *International Journal of Transgender Health*, *24*(1), 1–6.

Clarke, V., & Braun, V. (2016). Thematic analysis. *The Journal of Positive Psychology*, *12*(3), 297–298.

Comelli, T., Pelling, M., Hope, M., Ensor, J., Filippi, M.A., Menteşe, E.Y., & McCloskey, J. (2024). Normative future visioning: A critical pedagogy for transformative adaptation. *Buildings & Cities*, *5*(1), 83–110.

Cork, S., Alexandra, C., Alvarez-Romero, J.G., & Bennett, E.M. (2023). Exploring alternative futures in the Anthropocene. *Annual Review of Environment & Resources*, *48*(1), 25–54.

Cowie, R.H., Bouchet, P., & Fontaine, B. (2022). The sixth mass extinction: Fact, fiction or speculation? *Biological Reviews*, *97*(2), 640–663.

Cunningham, M.M., Tran, L., McKee, C.G., Polo, R.G., Newman, T., Lansing, L., et al. (2022). Honeybees as biomonitors of environmental contaminants, pathogens, and climate change. *Ecological Indicators*, *134*(1), 1–10.

Dege, C.L. (2023). On the political and normative implications of myth as philosophical discourse. *Critical Review of International Social and Political Philosophy*, *28*(2), 339–346.

Ellis, R. (2023). *Capitalist agriculture and the global bee crisis*. Routledge.

Farias, R.A., Nunes, C.N., & Quináia, S.P. (2023). Bees reflect better on their ecosystem health than their products. *Environmental Science and Pollution Research International*, *30*(33), 79617–79626.

Ferguson, J.P. (2024). Learning to live-with climate change through film: The arche-cinema of Gummo as climating and becoming-climate. *Australian Journal of Environmental Education*, *40*(5), 845–862.

Ferguson, J.P. (2024). Negentropic education for the Anthropocene: Flourishing as agapism. *Learning: Research and Practice*, *10*(2), 146–162.

Ferguson, J.P., & White, P.J. (2023). Science education in the Anthropocene: The aesthetics of climate change education in an epoch of uncertainty. *Frontiers in Education*, *8*, 1–14.

Fraser, A. (2025). One bee is no bee: The partnership between bees and humans. *Retrospect Journal*. retrieved from https://retrospectjournal.com/2025/02/16/one-bee-is-no-bee-the-partnership-between-bees-and-humans/

Ghajargay, M. (2025). Tellings of the Pacific Ocean: A landscape-based approach for multispecies design and HCI. *ACM Journal on Computing and Sustainable Societies*, *3*(3), 1–25.

Head, B.W. (2018). Forty years of wicked problems literature: Forging closer links to policy studies. *Policy and Society*, *38*(2), 180–197.

Heinemeyer, C., Reason, M., Quatermass, N., Wood, N., & Adekola, O. (2024). Mutual learning through participatory storytelling: Creative approaches to climate adaptation education in secondary schools. *Research in Education*, *118*(1), 87–107.

Hennessy, R., Cothren, A., & Matthews, A.T. (2024). *Cli-Fi' might not save the world, but writing it could help with your eco-anxiety*. The Conversation. https://theconversation.com/cli-fi-might-not-save-the-world-but-writing-it-could-help-with-your-eco-anxiety-218801.

Hill, R., Nates-Parra, G., Quezada-Euán, Jé J.G., Buchori, D., LeBuhn, G., Maués, M.M., Pert, P.L., Kwapong, P.K., Saeed, S., Breslow, S.J., Carneiro da Cunha, M., Dicks, L.V., Galetto, L., Gikungu, M., Howlett, B.G., Imperatriz-Fonseca, V.L., O'B. Lyver, P., Martín-López, B., Oteros-Rozas, E., Potts, S.G., Roué, M. (2019). Biocultural approaches to pollinator conservation. *Nature Sustainability*, *2*(1), 214–222.

Jacobsen, R. (2008). *Fruitless fall: The collapse of the honeybee and the coming agricultural crisis*. Bloomsbury.

Jones, R., Reid, P., & Macmillan, A. (2024). An indigenous climate justice policy analysis tool. *Climate Policy*, *24*(8), 1080–1095.

Jukes, S., Fox, R., Hills, D., White, P.J., Ferguson, J.P., Kamath, A., Logan, M., Riley, K., Rousell, D., Wooltorton, S., Whitehouse, H. (2024). Eco-anxiety and a desire for hope: A composite article on the impacts of climate change in environmental education. *Australian Journal of Environmental Education*, *40*(5), 811–830.

Jørgensen, P.S., Jansen, R.E.V., Ortega, D.I.A., Wang-Erlandsson, L., Donges, J.F., Österblom, H., et al. (2024). Evolution of the polycrisis: Anthropocene traps that challenge global sustainability. *Philosophical Transactions of the Royal Society B*, *379*(1893), 1–17.

Katumo, D.M., Liang, H., Ochola, A.C., Lv, M., Wang, Q.F., & Yang, C.F. (2022). Pollinator diversity benefits natural and agricultural ecosystems, environmental health, and human welfare. *Plant Diversity*, *44*(5), 429–435.

Kennett, J., & Matthews, S. (2008). Normative agency. In C. Mackenzie & K. Atkins (Eds.), *Practical identity and narrative agency* (pp. 212–231). Routledge.

Kirk, M., Tytler, R., & White, P. (2023). Critical thinking in primary science through a guided inquiry pedagogy: A semiotic perspective. *Teachers and Teaching*, *29*(6), 615–637.

Kumar, R. (2024). *Historical and religious perspective of honey*. CRC Press.

Laitinen, A. (2022). Normative powers, agency, and time. In C. Bagnoli (Eds.), *Time in action: The temporal structure of rational agency and practical thought* (pp. 52–72). Routledge.

https://doi.org/10.1017/aee.2025.10057 Published online by Cambridge University Press

Lunde, M. (2015). *The history of bees*. Simon & Schuster.

Mair, K.S., Irrgeher, J., & Haluza, D. (2023). Elucidating the role of honeybees as biomonitors in environmental health research. *Insects*, *14*(11), 1–17.

Malecki, W.P., Schneider-Mayerson, M., Petterson, A., Dobrowolska, M., & Thaker, J. (2025). The role of hope and fear in the impact of climate fiction on climate action intentions: Evidence from India and USA. *Poetics*, *108*, 1–11.

Milner, A., & Bergmann, J.R. (2020). *Science fiction and climate change: A sociological approach*. Liverpool University Press.

Monroe, M.C., Eames, C., White, P.J., & Ardoin, N.M. (2023). Education to build agency in the Anthropocene. *The Journal of Environmental Education*, *54*(6), 351–354.

Nakagawa, P., Nakagawa, H., & Bobiwash, K. (2025). Decolonizing indigenous science: Bees and indigenous sovereignty. *FACETS*, *10*(1), 1–11.

Ogunbode, C.A. (2022). Climate justice is social justice in the Global South. *Nature Human Behavior*, *6*(1443), 1–2.

Patel, V., Pauli, N., Biggs, E., Barbour, L., & Boruff, B. (2021). Why bees are critical for achieving sustainable development. *Ambio*, *50*(1), 49–59.

Patton, M.Q. (1999). Myths as normative frames for qualitative interpretation of life stories. *Qualitative Inquiry*, *5*(3), 338–352.

Peirce, C.S. (1894/1998). What is a sign?. In N. Houser, A. De Tienne, J.R. Eller, C.L. Clark, A.C. Lewis & D.B. Davis (Eds.), *The essential Peirce – selected philosophical writings* (Vol. *2*, pp. 4–10). Indiana University Press.

Peirce, C.S. (1903/1998). The three normative sciences. In N. Houser, A. De Tienne, J.R. Eller, C.L. Clark, A.C. Lewis & D.B. Davis (Eds.), *The essential Peirce – selected philosophical writings* (Vol. *2*, pp. 196–207). Indiana University Press.

Peirce, C.S. (1907/1998). Pragmatism. In N. Houser, A. De Tienne, J.R. Eller, C.L. Clark, A.C. Lewis & D.B. Davis (Eds.), *The essential Peirce – selected philosophical writings* (Vol. *2*, pp. 398–433). Indiana University Press.

Pievani, T. (2014). The sixth mass extinction: Anthropocene and the human impact on biodiversity. *Rendiconti Lincei*, *25*(1), 85–93.

Poelina, A., Paradies, Y., Wooltorton, S., Mulligan, E.L., Guimond, L., Jackson-Barrett, L., & Blaise, M. (2023). Learning to care for Dangaba. *Australian Journal of Environmental Education*, *39*(3), 375–389.

Poelina, A., Wooltorton, S., Blaise, M., Aniere, C.L., Horwitz, P., White, P.J., & Muecke, S. (2022). Regeneration time: Ancient wisdom for planetary wellbeing. *Australian Journal of Environmental Education*, *38*(3-4), 397–414.

Quigley, T.P., Amdam, G.V., & Harwood, G.H. (2019). Honeybees as bioindicators of changing global agricultural landscapes. *Current Opinion in Insect Science*, *35*(1), 132–137.

Rhoades, P., Haase, D.L., Pinto, J.R., & Wilkinson, K.M. (2013). The importance of bees in natural and agricultural ecosystems, *Technical coordinators*. In *National Proceedings: Forest and Conservation Nursery Associations –2012. Fort Collins (CO): USDA Forest Service, Rocky Mountain Research Station. Proceedings RMRS-P-69* (pp. 77–79). Retrieved from https://research.fs.usda.gov/treesearch/45636.

Rockström, J., Donges, J.F., Fetzer, I., Martin, M.A., Wang-Erlandsson, L., & Richardson, K. (2024). Planetary boundaries guide humanity's future on Earth. *Nature Reviews Earth & Environment*, *5*(11), 773–788.

Rockström, J., Steffen, W., Noone, K., Persson, Åsa, F.S. Chapin III, Lambin, E.F., Lenton, T.M., Scheffer, M., Folke, C., Schellnhuber, H.J., Nykvist, Börn, de Wit, C.A., Hughes, T., van der Leeuw, S., Rodhe, H., Sörlin, S., Snyder, P.K., Costanza, R., Svedin, U., Falkenmark, M., Karlberg, L., Corell, R.W., Fabry, V.J., Hansen, J., Walker, B., Liverman, D., Richardson, K., Crutzen, P., Foley, J.A. (2009). A safe operating space for humanity. *Nature*, *461*(7263), 472–475.

Roffet-Salque, Mélanie, Regert, M., Evershed, R.P., Outram, A.K., Cramp, L.J.E., Decavallas, O., Dunne, J., Gerbault, P., Mileto, S., Mirabaud, S., Pääkkönen, M., Smyth, J., Šoberl, L., Whelton, H.L., Alday-Ruiz, A., Asplund, H., Bartkowiak, M., Bayer-Niemeier, E., Belhouchet, L., Bernardini, F., Budja, M., Cooney, G., Cubas, M., Danaher, E.M., Diniz, M., Domboróczki, László, Fabbri, C., González-Urquijo, J.E., Guilaine, J., Hachi, S., Hartwell, B.N., Hofmann, D., Hohle, I., Ibáñez, J.J., Karul, N., Kherbouche, F., Kiely, J., Kotsakis, K., Lueth, F., Mallory, J.P., Manen, C., Marciniak, A., Maurice-Chabard, B., Mc Gonigle, M.A., Mulazzani, S., Özdoğan, M., Perić, O.S., Perić, Sša R., Petrasch, Jörg, Pétrequin, A.-M., Pétrequin, P., Poensgen, U., Joshua Pollard, C., Poplin, Fçois, Radi, G., Stadler, P., Stäuble, H., Tasić, N., Urem-Kotsou, D., Vuković, J.B., Walsh, F., Whittle, A., Wolfram, S., Zapata-Peña, L., Zoughlami, J. (2015). Widespread exploitation of the honeybee by early Neolithic farmers. *Nature*, *527*(1), 226–230.

Soroye, P., Newbold, T., & Kerr, J. (2020). Climate change contributes to widespread declines among bumble bees across continents. *Science*, *367*(6478), 685–688.

Stiegler, B. (2018). *The Neganthropocene*. Open Humanities Press.

Sultana, F. (2022). Critical climate justice. *The Geographical Journal*, *188*(1), 118–124.

Swain, D.L., Prein, A.F., Abatzoglou, J.T., Albano, C.M., Brunner, M., Diffenbaugh, N.S., et al. (2025). Hydroclimate volatility on a warming Earth. *Nature Reviews Earth & Environment*, *6*(1), 35–50.

Tytler, R., & White, J.P. (2023). Researching for system reform: Giving voice to the authoritative outsider. In P.J. White, R. Tytler, J.P. Ferguson & J.C. Clark (Eds.), *Methodological approaches to STEM education research* (Vol. *3*, pp. 245–265). Cambridge Scholars Publishing.

https://doi.org/10.1017/aee.2025.10057 Published online by Cambridge University Press

Tytler, R., White, J.P., Ferguson, J.P., Kamath, A., Sharma-Wallis, S., & Wajngarten, L. (2024). Promoting and tracking student agency in climate change education. In P.J. White, R. Tytler, J.P. Ferguson & J.C. Clark (Eds.), *Methodological approaches to STEM education research* (Vol. *5*, pp. 124–154). Cambridge Scholars Publishing,

Verlie, B. (2019). Bearing worlds: Learning to live-with climate change. *Environmental Education Research*, *25*(5), 751–766.

Verlie, B. (2021). Climate justice in more-than-human worlds. *Environmental Politics*, *31*(2), 297–319.

White, P.J., Ardoin, N.M., Eames, C., & Monroe, M.C. (2023). 297*Agency in the Anthropocene: Supporting document to the PISA, Science Framework* (OECD Education Working Papers, No. 297). OECD Publishing.

White, P.J., Ardoin, N.M., Eames, C., & Monroe, M.C. (2024). Agency in the Anthropocene: Education for planetary health. *The Lancet Planetary Health*, *8*(2), 117–123.

White, P.J., & Ferguson, J.P. (2025). The aesthetics-ethics-logic of climate change education in an epoch of uncertainty: Theory into practice. In P.J. White, R. Tytler, J. Ferguson, J.C. Clark & J. Brown (Eds.), *Methodological approaches to STEM education research* (Vol. *6*). Cambridge Scholars Publishing.

Williams, L. (2023). From indigenous philosophy in environmental education to indigenous planetary futures: What would it take? *Australian Journal of Environmental Education*, *39*(3), 320–335.

Wooltorton, S., & White, P.J. (2024). Towards an indigenous-informed multispecies collaboratory. *Australian Journal of Environmental Education*, *40*(3), 458–472.

Wright, L. (2019). Cli-fi: Environmental literature for the Anthropocene. In S. Baumbach & B. Neumann (Eds.), *New approaches to the twenty-first-century anglophone novel*. Palgrave Macmillan.

Young, R.L. (2022). *Climate change education: Reimagining the future with alternative forms of storytelling*. Rowman & Littlefield.

Zapata-Hernández, G., Gajardo-Rojas, M., Calderón-Seguel, M., Muñoz, A.A., Yáñez, K.P., Requier, F., et al. (2024). Advances and knowledge gaps on climate change impacts on honeybees and beekeeping: A systematic review. *Global Change Biology*, *30*(3), e17219.

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Peta J. White is an Associate Professor in Science and Environmental Education at Deakin University. She led the OECD PISA Environmental Science contribution to the 2025 Science Framework "Agency in the Anthropocene" and is active in climate change education research and advocacy. Peta Co-directs the Centre for Regenerating Futures —a Faculty Centre that explores Anthropocene challenges and decolonising practices while building researcher capacity. She is the Editor-In-Chief of the Australian Journal of Environmental Education. Her current research follows three narratives: science and biology education; sustainability, environmental, and climate change education; and collaborative/activist methodology and research.

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