Project Report

Technostress in the Age of GenAI:

Voices from L2 doctoral students in the UK

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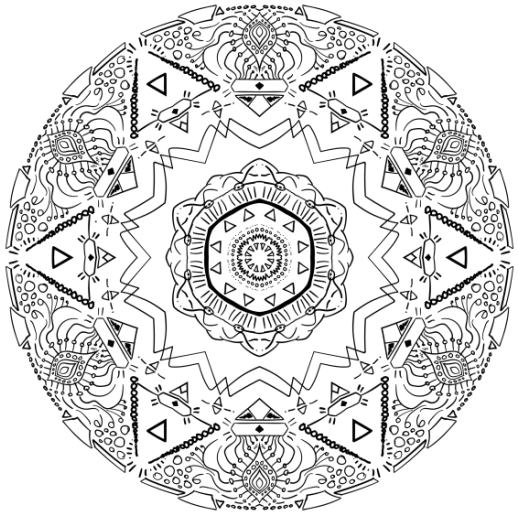
Project Overview

This student-led interdisciplinary research project, drawing upon Applied Linguistics, the School of Modern Languages and Warwick Medical School, examines the negative psychological and behavioural impact on L2 doctoral students arising from the introduction or adoption of generative AI tools based on large language models.

By addressing this under-researched area, this project aims to raise awareness of the critical need to mitigate the (potential) negative impacts of evolving technologies on student well-being. The research findings provide valuable insights for Warwick and beyond to effectively support student success while navigating the ethical and psychological implications of using generative AI tools.



Project details

Introduction

Since the launch of ChatGPT in November 2022, generative AI (GenAI) tools based on large language models have gained widespread adoption in all sectors of society, including Higher Education (HE). While research increasingly highlights the various opportunities GenAI offers in HE, encompassing the four major educational domains: learning, teaching, assessment and administration (Chiu, 2024), limited attention has been given to addressing its negative impacts, such as technostress, defined as the negative impact on an individual's attitudes, psychology, and behaviour resulting from the introduction or adoption of new or evolving technology (Weil & Rosen, 1997).

In the context of HE, research has shown that language barriers constitute a major challenge for L2 doctoral students in English-speaking countries (Gao, 2021). Compared to English L1 background students, L2 doctoral students can be significantly disadvantaged by the additional time and effort required to navigate the language barriers in their academic pursuit. It would be ideal for them to harness the benefits of GenAI for their academic pursuit in L2, considering the potential they can offer for language learning and research (e.g., Pack & Maloney, 2023). However, there is a lack of clear ethical guidelines on acceptable uses for AI tools for this disadvantaged student group among HE in the English-speaking countries. As a result, L2 doctoral students may experience more complex ethical terrain when it comes to using GenAI for academic pursuit, which can severely impact their wellbeing. This project aims to explore this issue and address the gap in literature.

This student-led interdisciplinary research project, drawing upon expertise in Applied Linguistics, School of Modern Languages and Warwick Medical School, examined the negative psychological and behavioural impact on L2 doctoral students arising from the introduction or adoption of generative AI tools based on large language models. By addressing this under-researched area, this project has raised awareness about the critical need to mitigate the negative impacts of evolving technologies on student well-being. The research findings provide valuable insights for Warwick and beyond to effectively support student success while navigating the ethical and psychological implications of using generative AI tools.

Data collection stages

This project consisted of three stages, which involved 20 students across 12 different disciplines from Warwick, including four from Applied Linguistics, three from Education Studies, two from PAIS, two from GSD, two from WMG , one from WBS, one from SMLC, one from English and Comparative Literary Studies, one from Sociology, one from Chemistry and one from Statistics and one from engineering. We attracted participants from 14 different cultural and linguistic backgrounds, including Malawi, Indonesia, Pakistan, China, Kazakhstan, India, Türkiye, Chile, Malaysia, Bangladesh, Spain, Russia, Egypt, and the UK.

Stage 1: We organised a face-to-face two-hour zine-making workshop to explore the technostress experienced by **eight** L2 doctoral students at Warwick. Participants were introduced to the project, the team, the notion of technostress, and the method of zine-making. Participants were then invited to make their own zine to tell their stories of technostress related to GenAI. Finally, each participant presented their zine to the whole group. We also collected participants' feedback on this event. At this stage, we collected eight zine pages and zine presentations, and eight feedback responses. See Table 1 for the agenda and zines collected from this stage.

Stage 2: We did an online one-hour semi-structured interview with **five** L2 doctoral students at Warwick on Teams. The interviews were video recorded directly on Teams. For each of the interview, we produced an interview summary as well as the key quotes related to technostress, coping strategies and needed support. See Table 1 for one example of the interview summary and quotes.

Stage 3: We organised another face-to-face two-hour zine-making workshop as a means for participatory dissemination of existing research findings: including the zines and zine presentations of Stage 1 and the interview summary and key quotes of each interviewee from Stage 2. This stage attracted **eight** participants, with one L1 Research Assistant member staff, six L2 doctoral students and one PGT student. Similar to Stage 1, Participants in Stage 3 were introduced to the project, the team, the notion of technostress, and the method of zine-making. Participants were then invited to make their own zine to interpret the data of Stage 1 and Stage 2. Specifically, participants were asked to identify the factors causing technostress, the coping strategies, and the support needed from the university and the HEIs in general. Participants decided to work in groups to produce their zine pages together. Finally, participants presented their zine to the whole group. We also collected participants' feedback on this event. At this stage, we collected three zine pages and zine presentations, and five feedback responses. See Table 1 for the agenda and zines collected from this stage.

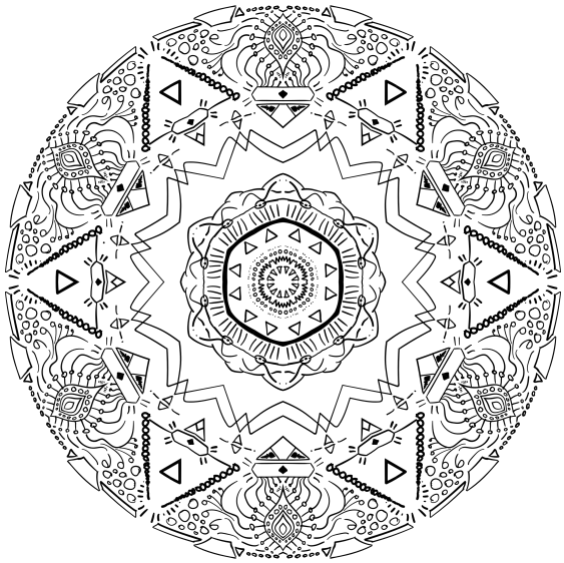
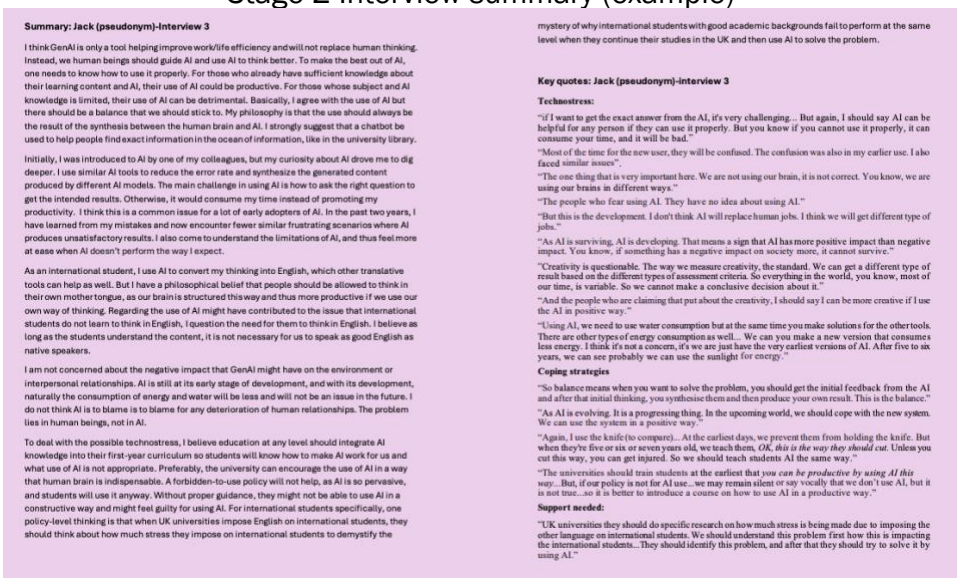


Table 1

Stage 1 Agenda (8 participants)	Stage 1 Zines
30th April 2025 • 10:15-10.30- Registration and refreshments • 10.30-10.40- Introduction • 10.40-11.00- Short Talks • “AI, translation and sustainability” by Dr. David Orrego-Carmona) • "AI and wellbeing in HE" by Dr. Carla Toro • 11.00-11:15- Group discussion on AI use • 11:15-12:20—Technostress and zine-making • 12:20-12:30- Feedback and conclusion • 12:30- Lunch	

Stage 2 Interview (5 participants)
One to one on Teams, one hour each

Stage 2 Interview summary (example)



Summary: Jack (pseudonym)-Interview 3

I think GenAI is only a tool helping improve work/life efficiency and will not replace human thinking. Instead, we human beings should guide AI and use AI to think better. To make the best out of AI, one needs to know how to use it properly. For those who already have sufficient knowledge about their learning content and AI, their use of AI could be productive. For those whose subject and AI knowledge is limited, their use of AI can be detrimental. Basically, I agree with the use of AI but there should be a balance that we should stick to. My philosophy is that the use should always be the result of the synthesis between the human brain and AI. I strongly suggest that a chatbot be used to help people find exact information in the ocean of information, like in the university library.

Initially, I was introduced to AI by one of my colleagues, but my curiosity about AI drove me to dig deeper. I use similar AI tools to reduce the error rate and synthesize the generated content produced by different AI models. The main challenge in using AI is how to ask the right question to get the intended results. Otherwise, it would consume my time instead of promoting my productivity. I think this is a common issue for a lot of early adopters of AI. In the past two years, I have learned from my mistakes and now encounter fewer similar frustrating scenarios where AI produces unsatisfactory results. I also come to understand the limitations of AI, and thus feel more at ease when AI doesn't perform the way I expect.

As an international student, I use AI to convert my thinking into English, which other translative tools can help as well. But I have a philosophical belief that people should be allowed to think in their own mother tongue, as our brain is structured this way and thus more productive if we use our own way of thinking. Regarding the use of AI might have contributed to the issue that international students do not learn to think in English, I question the need for them to think in English. I believe as long as the students understand the content, it is not necessary for us to speak as good English as native speakers.

I am not concerned about the negative impact that GenAI might have on the environment or interpersonal relationships. AI is still at its early stage of development, and with its development, naturally the consumption of energy and water will be less and will not be an issue in the future. I do not think AI is to blame is to blame for any deterioration of human relationships. The problem lies in human beings, not in AI.

To deal with the possible technostress, I believe education at any level should integrate AI knowledge into their first-year curriculum so students will know how to make AI work for us and what use of AI is not appropriate. Preferably, the university can encourage the use of AI in a way that human brain is indispensable. A forbidden-to-use policy will not help, as AI is so pervasive, and students will use it anyway. Without proper guidance, they might not be able to use AI in a constructive way and might feel guilty for using AI. For international students specifically, one policy-level thinking is that when UK universities impose English on international students, they should think about how much stress they impose on international students to demystify the mystery of why international students with good academic backgrounds fail to perform at the same level when they continue their studies in the UK and then use AI to solve the problem.

Key quotes: Jack (pseudonym)-interview 3

Technostress:

“if I want to get the exact answer from the AI, it's very challenging… But again, I should say AI can be helpful for any person if they can use it properly. But you know if you cannot use it properly, it can consume your time, and it will be bad.”

“Most of the time for the new user, they will be confused. The confusion was also in my earlier use. I also faced similar issues”.

“The one thing that is very important here. We are not using our brain, it is not correct. You know, we are using our brains in different ways.”

“The people who fear using AI. They have no idea about using AI.”

“But this is the development. I don't think AI will replace human jobs. I think we will get different type of jobs.”

“As AI is surviving, AI is developing. That means a sign that AI has more positive impact than negative impact. You know, if something has a negative impact on society more, it cannot survive.”

“Creativity is questionable. The way we measure creativity, the standard. We can get a different type of result based on the different types of assessment criteria. So everything in the world, you know, most of our time, is variable. So we cannot make a conclusive decision about it.”

“And the people who are claiming that put about the creativity, I should say I can be more creative if I use the AI in positive way.”

“Using AI, we need to use water consumption but at the same time you make solutions for the other tools. There are other types of energy consumption as well… We can you make a new version that consumes less energy. I think it's not a concern, it's we are just have the very earliest versions of AI. After five to six years, we can see probably we can use the sunlight for energy.”

Coping strategies

“So balance means when you want to solve the problem, you should get the initial feedback from the AI and after that initial thinking, you synthesise them and then produce your own result. This is the balance.”

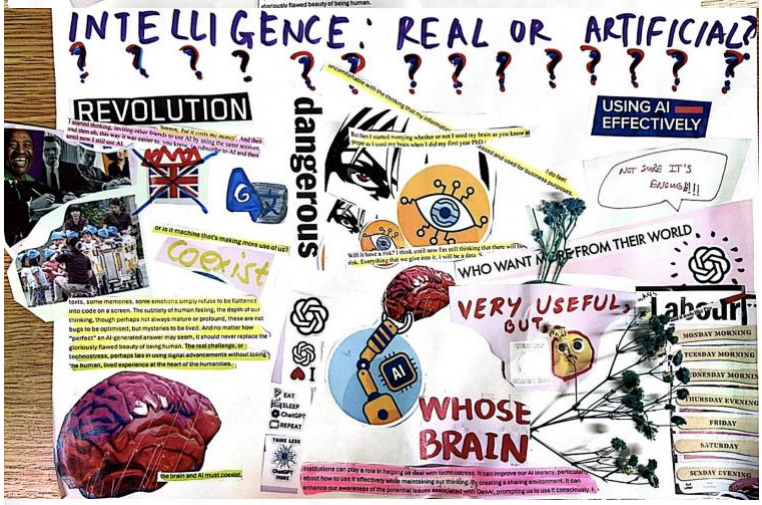
“As AI is evolving. It is a progressing thing. In the upcoming world, we should cope with the new system. We can use the system in a positive way.”

“Again, I use the knife (to compare)… At the earliest days, we prevent them from holding the knife. But when they're five or six or seven years old, we teach them, *OK, this is the way they should cut*. Unless you cut this way, you can get injured. So we should teach students AI the same way.”

“The universities should train students at the earliest that *you can be productive by using AI this way*…But, if our policy is not for AI use…we may remain silent or say vocally that we don't use AI, but it is not true…so it is better to introduce a course on how to use AI in a productive way.”

Support needed:

“UK universities they should do specific research on how much stress is being made due to imposing the other language on international students. We should understand this problem first how this is impacting the international students…They should identify this problem, and after that they should try to solve it by using AI.”

Stage 3 Agenda (8 participants)	Stage 3 Zines
25th June 2025 • 10.15-10.30 Registration and refreshments • 10.30-10.40 Introduction to the project, team • 10.40-10.50 Warm-up Group discussion • 10.50-11.00 Stage 1 and Stage 2 data • 11.00-11.50 Individual/Collaborative zine-making • 11.50-12.20 Zine presentation • 12.20-12.30 Workshop feedback • 12.30 - Lunch	  

Analysis and Results

The recordings of data, including the zine presentations of Stage 1 and Stage 3 as well as the interview data of Stage 2, were transcribed word-for-word. Then, for the data of Stage 1 (zines and zine-presentations, see Figure 1 for an example of the data from one of the participants), qualitative content analysis (Elo et al., 2014) was adopted as the main analytical approach to identify themes of the zine-making data.

For the interview data of Stage 2, reflexive thematic analysis (Braun & Clarke, 2024) was adopted. Three themes included the key factors causing technostress, coping strategies and support needed were identified. The themes were triangulated with the data of Stage 3.

Figure 1

Stage 1 data-example: zine and zine presentation

Hi, my zine is pretty simple. So it's about the war that's between humans and robots also known as the AI!. But Long story short, 'THE WORD IS OUT!' and there's 'a war for talent', and 'who wants more from the world?' Is it us humans? We're gonna make use of the machine or is it machine that's making more use of us? So. But then without negative... we spoke about the good thing about AI. But without negative comments, positive ones won't matter, so we do need to highlight. The potential shortcomings or the potential dangers and threats this new technology has added to humans, which is taking away lots of our brain power, making humans complacent in general. So is it time to start the advancement and let humans flourish the way they've been doing naturally? Or is it about time that we really let the computers take over the world?

Technostress

This interdisciplinary collaborative research project aimed to examine the negative psychological and behavioural impact on you arising from the introduction or adoption of generative AI tools based on large language models. Academically, this is termed as technostress, the negative impact on an individual's attitudes, psychology, and behaviour resulting from the introduction or adoption of new or evolving technology (Weil & Rosen, 1997). By exploring this issue, this project aims to raise awareness of the critical need to mitigate the (potential) negative impacts of evolving technologies on student well-being. The research findings will provide valuable insights for Warwick and beyond to effectively support student success while navigating the ethical and psychological implications of using generative AI tools.

Key takeaways

Stage 1:

The analysis of the zine-making data indicated the complexity of participants' attitudes towards the adoption and the use of GenAI. The zines demonstrated explicitly participants' mixed emotions regarding GenAI. The zine presentations revealed

(1) the tension between wonder and worry that participants experienced while living in the present in the GenAI age. On the one hand, they were filled with curiosity and awe by the benefits that AI has created (e.g., reduced workload; enhanced efficiency; easier life; language enhancement, and improved intercultural communication competence). On the other hand, they had anxiety and fear caused by various concerns about using AI (e.g., outsourcing thinking; human brain disengagement; data privacy issues; reduced human agency and questionable reliability).
(2) the hope to build a wise and shared future for the use of GenAI while envisaging what lies ahead in the era of GenAI age. The future is characterised by accountability and reflection, humanistic AI development, informed education and employability, coexistence of the human brain and AI, sustainable use of AI and balanced media coverage of AI.
(3) the reflection on AI as a part of the human journey while looking back on the development of human history. Human culture tends to be more powerful than various emerging technologies. Unique human thinking makes us distinct from AI. What we experience now is just a fragmented part of the development of AI. The issues regarding AI and concerns about AI are normal processes in the development of AI. Increased AI literacy can help reduce the worry about AI and false accusations caused by ignorance and misuse of AI.

The feedback collected from Stage 1 zine-making workshop demonstrates that:

(1) Participants enjoyed the session and believed that the session was insightful for them to think about AI use.
(2) Participants believed that using zine-making to tell and share their AI story is creative, helpful (more vivid storytelling, organising their thoughts, sharing personal voices effectively, encouraging critical thinking, facilitating the reflection), and informative (learning about others' thoughts).

(3) Key takeaways for participants included the knowledge of technostress; the appropriateness to discuss the negative of AI; the validation for inner peace; the necessity to keep conversation going; a potential way to build the community for sharing AI thoughts.
(4) Participants believed that sharing is the key to dealing with technostress. Additionally, to reflect, to enhance awareness, and to think differently also helps.

Stage 2 & 3:

(1) Key factors causing technostress in the age of GenAI

While participants in this study recognised the various benefits of GenAI, including enhancing work efficiency and productivity, improving language quality and overcoming language barriers, reducing workload and human labour, as well as satisfying spontaneous human needs, they acknowledged a variety of technostress experienced by themselves or people around them.

1) Fear of reduced human brain engagement and decreased human agency. Participants worried that they were not learning themselves, not using their brains enough or were being too AI-dependent.
2) Lack of confidence in the data security of GenAI. Participants wondered if their personal data would be stored, collected, and used for illegal or commercial purposes.
3) Lack of confidence in using AI, or in making the most of AI.
4) Stress in choosing answers produced by different AI tools.
5) Negative environmental impact caused by using GenAI. Participants doubted if their use of GenAI was worth the cost to the planet.
6) Moral stress caused by uncredited artworks reproduced by AI. Participants realised that the ability of AI to create art works was trained by the real artworks produced by artists, whose contribution was not credited properly.
7) Fear of distanced human relationships caused by GenAI as people prefer AI to human beings or are asked to turn to AI when in need of information.
8) Fear of deterioration in interpersonal relationships and negative impact on social interactions when people trust AI blindly for advice on relationships.
9) Ethical dilemmas and internal conflict- the tension of whether to use or not to use. On the one hand, participants felt the use of AI was not a must and sometimes can cause unfairness. On the other hand, they worried that not using AI would put them at a disadvantage, especially if no specific rules were stated against it.
10) Concern about people's blindness in trusting information produced by GenAI, which may lead to cognitive bias and impede societal development.
11) Fear of skill degradation due to a lack of practice.
12) Concern about the large amounts of time spent crafting prompts and refining outputs to get exact answers from GenAI.
13) Confusion about the line between what is allowed and what is forbidden in using AI for academic purposes
14) Frustration and anger prompted by unsuccessful interactions with AI
15) Fear of being left behind or considered less competent if one does not adopt AI

16) Concern about AI's taking human jobs

(2)Coping strategies in relation to technostress caused by GenAI

Correspondingly, participants shared some strategies that they themselves can take to deal with the aforementioned factors which cause technostress.

1) Practice AI detoxification: stop using AI completely for a while to be free from some stress
2) Limit AI time: use AI for the information in the least amount of time
3) Rationalise AI use: refer to AI only to meet deadlines instead of being lazy
4) Do it by oneself once in a while to sustain essential skills, including critical thinking
5) Incorporate one' s own thinking while seeking support from AI for answers
6) Adapt AI answers to make it one's own
7) Adopt a pragmatic adaptation mechanism: Change what you can and adapt to what you can't
8) Enhance personal AI literacy through informal learning (YouTube videos and online articles)
9) Be cautious about the information produced by AI and always double check
10) Communicate with others to demystify the concerns regarding the use of GenAI
11) Develop a balanced view of GenAI and recognise its status of early development, not yet mature
12) Enable artists to opt out of their works from being used for AI training to protect their copyright
13) Recognise that initial difficulties are commonplace among new GenAI users
14) Acknowledge the water consumption caused by using AI but have hope for its green development
15) Reconceptualise brain engagement in the era of GenAI
16) Redefine creativity in the age of AI and recognise the potential of AI in contribution to creativity
17) Focus on the possibility of AI-induced job opportunities and role redefinition
18) Recognise human control and decision-making power in using AI instead of acting like passive victims
19) Seek advice on the integration of AI into work
20) Consider AI only as a tool that either works or not work
21) Develop resilience through more successful experiences with AI
22) Build unique human value to remain irreplaceable by GenAI

(3)Institutional Support needed in response to technostress caused by GenAI

Additionally, participants shared their views on how the institutions can do to support students to deal with or avoid the aforementioned technostress in the era of GenAI.

1) Build students' AI literacy by enabling experiential learning, conducting informal workshops, organising AI competitions, delivering hands-on lectures, integrating AI into curriculum, or introducing a course on how to use AI in a productive way
2) Encourage responsible AI use with clear guidelines
3) Acknowledge the environmental impact of GenAI and discuss the shared responsibility
4) Build up confidence in human power while bringing visibility to the possible damage caused by GenAI to human agency and capability
5) Gather peer testimonies to bring attention to the negative impact of GenAI and for peer validation

6) Create a community to share, particularly the success in using AI tools, reflect and grow
7) Redefine assignments to include something beyond facts and reflections
8) Teach students to think with the support of the machine and possibly grade their assignments by how well they interact with AI for enhancing their thinking
9) Make AI tools accessible and create a repository to support students in navigating opportunities and challenges in using AI

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