THE PORTSMOUTH GRAMMAR SCHOOL

# ITHAKA EVENING

WEDNESDAY 26TH FEBRUARY 2025

Front page image: a close up image of the funghi studied by Alice C. for her project

# PROGRAMME

Welcome from Mr David Wickes, Head

Ithaka by Constantine P. Cavafy

Introduction to this evening's pupil presentations,
Mr Paul Gamble, Co-ordinator of Sixth Form Extend and EPQ

Presentations by the twelve pupils nominated for the
Ithaka Award

Judging and feedback on projects, Mr James Burkinshaw,
Head of Careers, Universities and Scholarship

Announcement of the winner of the 2025 Ithaka Award by our
Guest of Honour, Mr Matt Bryan, OP

Closing remarks and thanks

# FINALISTS

**Bhushan B.**
What is the biggest setback to health providers in using AI for screening within ophthalmology, radiology and pathology? (EPQ)

**Alice C.**
An experiment demonstrating the foraging behaviours of cord-forming fungi. (EPQ)

**Sakura E.**
How far has the role of social media led to an increase in misogyny in younger men in the Western World post 2000? (EPQ)

**Grace G.**
A story, with 3 segments, set in the 19th century, dealing with the suspects and the victims of the Jack the Ripper case, using the influence of Arthur Miller's 'The Crucible'. (EPQ)

**Jiali H.**
An oil painting to support the well-being of high school students in China. (EPQ)

**Keryan L.**
Built a bipedal robot (EPQ)

**Marvin L.**
Where would decelerated ageing have the greatest impact? The USA or Indonesia? (PGS Extend)

**Chloe M.**
Created a jacket that is suitable for several social settings. (PGS Extend)

**Marinela P.**
Can an economy be successful with a dictatorship? (PGS Extend)

**Rowan R.**
Design, reconstruct and play the Ancient Egyptian board game 'Hounds and Jackals'. (EPQ)

**Sabiha S.**
How effective is psychosurgery at treating major depressive disorder? (EPQ)

**Nikhil S.**
What are the effects of chillies on human health especially with reference to cancer prevention. (PGS Extend)

# ITHAKA

As you set out for Ithaka
hope your road is a long one,
full of adventure, full of discovery.
Laistrygonians and Cyclops,
angry Poseidon - don't be afraid of them:
you'll never find things like that on your way
as long as you keep thoughts raised high,
as long as a rare excitement
stirs your spirit and your body.
Laistrygonians, Cyclops,
wild Poseidon - you won't encounter them
unless you bring them along inside your soul,
unless your soul sets them up in front of you.

Hope your road is a long one.
May there be many summer mornings when,
with what pleasure, what joy,
you enter harbours you're seeing for the first time;
may you stop at Phoenician trading stations
to buy fine things,
mother of pearl and coral, amber and ebony.
sensual perfume of every kind -
as many sensual perfumes as you can;
and may you visit many Egyptian cities
to learn and go on learning from their scholars.

Keep Ithaka always in your mind.
Arriving there is what you're destined for.
But don't hurry the journey at all.
Better if it lasts for years,
so you're old by the time you reach the island,
wealthy with all you've gained on the way,
not expecting Ithaka to make you rich.

Ithaka gave you the marvellous journey.
Without her you wouldn't have set out.
She has nothing left to give you now.

And if you find her poor, Ithaka won't have fooled you.
Wise as you will have become, so full of experience,
you'll have understood by then what these Ithakas mean.

*Constantine P. Cavafy, translated by Edmund Keeley & Philip Sherrard*

# PGS EXTEND AND THE ITHAKA PRIZE

When creativity is combined with resilience and resourcefulness, and with the skills of research, evaluation and independence, the most impressive human achievements emerge. At The Portsmouth Grammar School, all our pupils are encouraged to carry out independent research, and to be original in their approach but rigorous in their academic honesty. We subscribe to Edward de Bono's belief that 'creativity is a great motivator because it makes people interested in what they are doing … [it] gives the possibility of some sort of achievement to everyone … [and] it makes life more fun and more interesting'. The Ithaka prize is our celebration of the creative journey PGS Sixth Form pupils experience when they carry out their research projects for PGS Extend or the AQA Extended Project Qualification (EPQ).

All pupils in Year 12 follow our Extend course as part of their core curriculum. Pupils work alongside a Supervisor to undertake an Extended Project on a topic of their choice, identifying appropriate sources and methods for their research. They complete the projects independently during the Spring and Summer Terms and then submit them at the end of Year 12. Since 2020, pupils following the Extend course have been able to choose between completing either an EPQ or our longstanding in-house PGS Extend project. The EPQ is an externally certified qualification and is highly regarded by universities and employers alike; completing an EPQ is a significant achievement and all the more so for pupils in Year 12.

The EPQ projects completed by our largest cohort of 57 Year 12 pupils last year were submitted to the AQA exam board and achieved an excellent set of results, with 30% of grades at A*, 63% A*A and 100% A*-C grade in this demanding qualification, equivalent to half an A-Level. The very best of this outstanding body of work is nominated for the Ithaka Prize for Independent Learning. The celebration this evening enables the finalists to showcase their projects and reflections on carrying out the research, before the prize is presented for the piece which has displayed the highest standard of research and creative skills.

Every year, our Sixth Formers benefit greatly from their extended projects as part of their university applications. Higher Education Institutions are particularly keen to see evidence of studies beyond examination syllabuses and a number make lower, alternative offers to pupils who successfully complete an EPQ. Indeed, at the time of writing, our current Year 13 pupils have received a total of almost 100 of these lower offers on account of completing the EPQ. Successful Extended Projects provide an excellent grounding for further study. Last year's Ithaka prize recipient, Annika B, is now studying Medicine at the University of Nottingham having completed her EPQ on the role of physical and mental exercise in delaying the onset of Alzheimer's Disease.

We hope and believe that you will be inspired, entertained and informed by the pupils' work. The breadth and quality of their work is breathtaking, and it should be remembered that this evening's presentations represent only a sample of the completed projects. As you will see, the judging panel have been faced with an incredibly difficult decision.

Mr Paul Gamble, Co-ordinator of Sixth Form Extend and EPQ

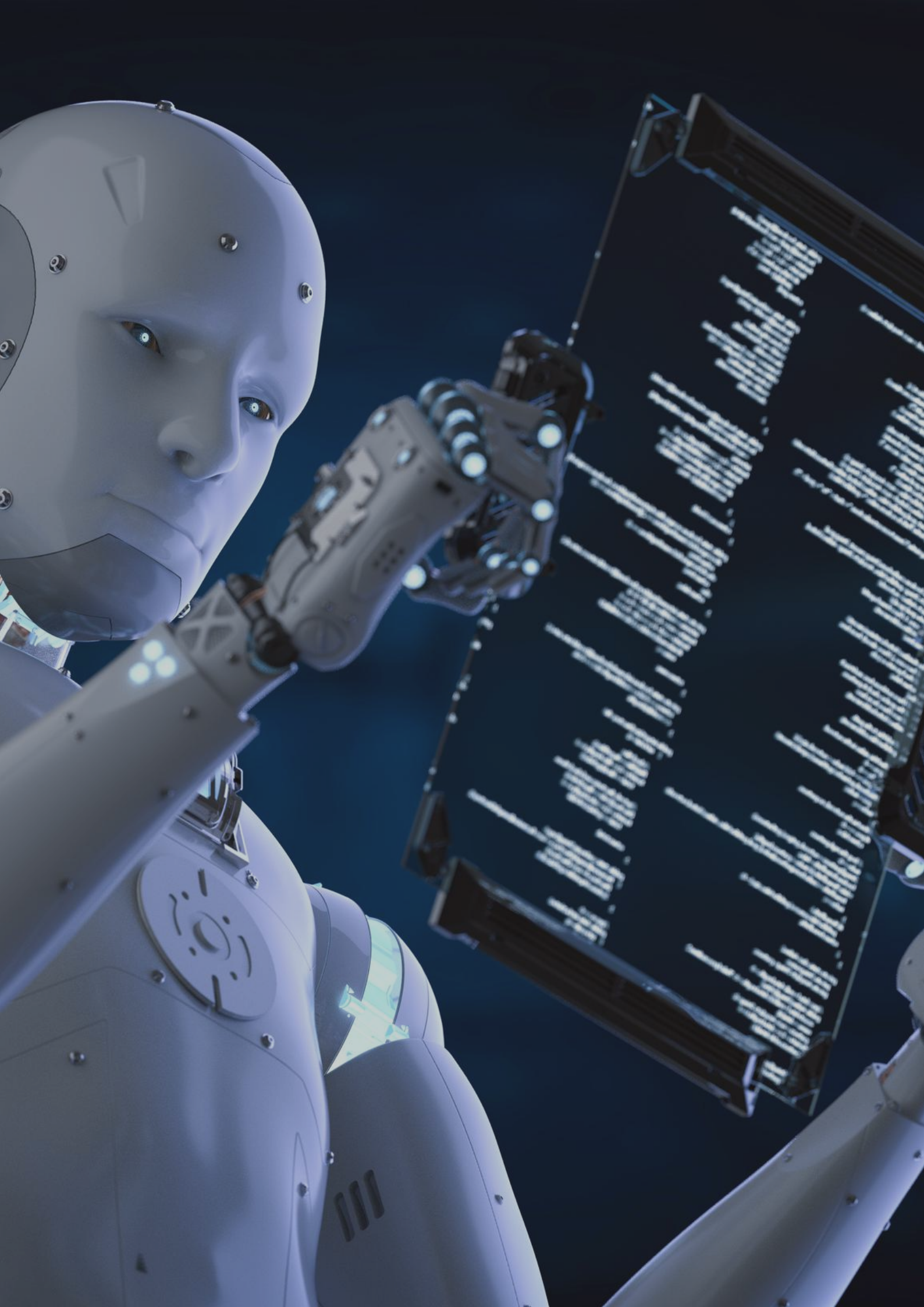
# Guest of Honour, Matthew Bryan, OP

Matt attended Sixth Form at The Portsmouth Grammar School from 2018 to 2020, taking A Levels in Physics, Chemistry, Mathematics and Further Mathematics. Matt's PGS Extend entitled 'The Hour Record: An Engineer's View' won the Ithaka Prize in 2020, focusing on the history behind and mathematical modelling of cycling's most legendary record.

The report discussed how engineering is essential in the race to ride the furthest distance in an hour, and combined his passion for cycling with the fundamental physical factors (aerodynamic drag, frictional losses etc.) that cutting-edge technologies aim to combat.

Following this, he read the Engineering Tripos at Magdalene College, University of Cambridge, specialising in Mechanical, Information & Control Engineering, graduating MEng with a double first in 2024. During his undergraduate degree and placements at Siemens MRI Oxford, he found himself drawn to research, especially in dynamics, vibration, and machine-learning.

In his final year, he was awarded a research studentship funded by Bose to undertake a PhD at Cambridge on hybrid physics/machine-learning models for active noise cancellation. He remains at Magdalene, teaching mechanics to first and third year engineering undergraduates in addition to interviewing for admissions. He is also still a keen cyclist and choral singer (at Queens' College Cambridge and occasionally Portsmouth Cathedral).



# Bhushan B.

**What is the biggest setback to health providers in using AI for screening within ophthalmology, radiology and pathology? (EPQ)**

**Supervisor: Mr M Hill**

My personal passion for computer science, combined with my family's medical professions, led me to a project which merged computer science with medicine.

I was particularly interested in the recent developments in AI, so I wanted to find the greatest setback of using AI in healthcare. I went on to research different uses of AI within healthcare in many areas such as primary care, psychiatry and insurance, however it was in ophthalmology, pathology and radiology I found the greatest potential for a project. I went on to research these areas further, using different articles, surveys and reports from various bodies ranging from governments, clinicians, technology companies and others. During this process I carefully assessed the risk of any bias from the authors. I identified the key setbacks as training Main Users, Efficacy, Legal Responsibility, Explainability, Patient Trust and Cost, and came to the conclusion that training the Main Users was the greatest setback, defending this conclusion with a criteria I created within my report.

# Alice C.

**Carry out an experiment demonstrating the foraging behaviours of cord-forming fungi. (EPQ)**

**Supervisor: Mr M Hill**

When you walk through a woodland, your mind is almost certainly on the things you'll find by looking up - so absorbed by the trees and the birds that you almost trip over the rotting log at your feet.

Something you might be less aware of is the silent web of life, lying ten centimetres below your feet, without which none of the splendour above would be possible.

I've been fascinated by fungi ever since I read Merlin Sheldrake's *Entangled Life*. Nature's unsung heroes, the role they've played in earth's past (and the role they'll play in humanity's future) is astounding. They acted as roots for the first ever land plants, before they evolved anchors of their own, and still act as such today. They allow plants of all kinds to share resources and distribute toxins throughout a forest, creating ecosystems more resistant to climate change - mycological technologies have applications in fields ranging from transplant medicine to waste disposal to network theory.

For my EPQ, I wanted to study the remarkable capability fungal networks have to rearrange themselves - to better assimilate existing food sources, forage for new ones, and maximise efficiency when resources become scarce. With invaluable guidance from Professor Sarah Christofides of Cardiff University's Fungal Ecology Department, I cultured several samples of Hypholoma fasciculare in (completely homemade) microcosms of their natural environment. I varied the placement of food sources within each tray, and was successful in replicating the results of each paper that inspired me to begin my project!

# Sakura E.

**How far has the role of social media led to an increase in misogyny in younger men in the Western World post 2000? (EPQ)**

**Supervisor: Mr S Lemieux**

I chose this topic to link my passion for psychology, politics and feminism into one sizable project.

My research included all manner of resources and analysis, including books such as *Men Who Hate Women* by Laura Bates. The essay was broken down into four subtopics: incels, the manosphere, algorithms and misogynistic influencers. My evidence led me to conclude that there is a strong argument that social media has increased the levels of misogyny in younger men in the western world.

Image:The Strand, London,
late 19th Century

# Grace G.

**To write a story, with 3 segments, set in the 19th century, dealing with the suspects and the victims of the Jack the Ripper case, using the influence of Arthur Miller's *The Crucible*. (EPQ)**

**Supervisor: Mr M Hill**

I chose this as my EPQ as I found it combined both my love for history and a passion for creative writing.

I found that writing a story allowed me to not only express my own opinion and thoughts, but also through emulating Miller's writing style, I found satisfaction in drawing comparisons and connections between different parts of history. I was able to approach the research using a wide range of sources, including doing a walking tour in London where I gained insight into the lives of both Jack the Ripper and his victims. In the end, I found that I had been successful in producing a story that paralleled *The Crucible* in its themes, and also engaged in a process of writing that had pushed me out of my initial comfort zone.

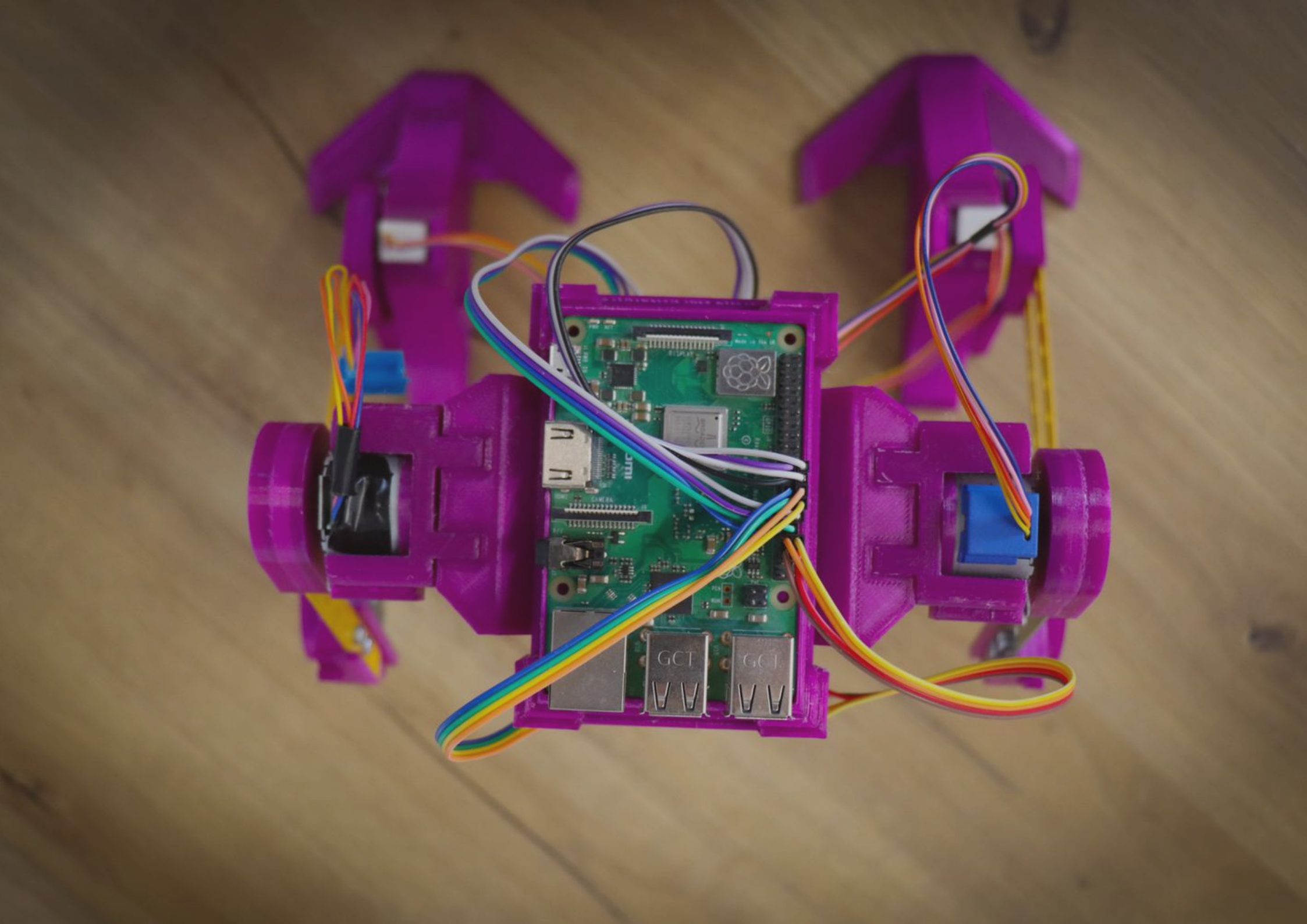
# Jiali H.

**Create an oil painting to support the well-being of high school students in China. (EPQ)**

**Supervisor: Mr P Gamble**

This was not my first idea.

I originally planned to write an essay on student mental health in China and if and how it was impacted by the most recent education reform. What I realised very quickly was that this was an astoundingly depressing topic and very little research discussed the potential influences of the education system on teenagers' mental well-being. So, around the end of January (which was much later than both my supervisor and Mr Gamble was comfortable with), I decided to shift my focus to creating artwork to support mental well-being, building on my interest in art therapy. I thought about the appeal of art galleries and looked into how viewing artworks affected the mind and body, which led me to a charity that transformed NHS psychiatric wards with wall murals as well as journal articles detailing the psychophysiological effects of viewing nature photos on both stressed and unstressed individuals. I created a checklist using the research I'd done to help me determine what to paint, painted the painting, and made a questionnaire to evaluate if it really did have positive psychological effects. I sent this out to high school students in China and received an overall response that the painting felt relaxing, which was my intention and which aligned with the research I'd read.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# Keryan L.

**To build a bipedal robot (EPQ)**

**Supervisor: Miss S Stewart**

As soon as I knew I could do an artefact, I chose to make a robot. I wanted to challenge myself and decided to build a bipedal robot that is mostly inspired by Star Wars droids but also by nature by mimicking cats and ostrich morphology and movement.

This project was made in different steps, including research, modelling, printing, assembly, and coding. I contacted an expert in the field after doing my research, which helped me manage my thoughts and ideas to make this project realistic. It allowed me to improve on 3D modelling and extend my knowledge of bipedal robotics. This project encountered problems in both hardware and software, which slowed down the building process, but in the end, the build was completed with almost all set goals reached.

# Marvin L.

**Where would decelerated ageing have the greatest impact? The USA or Indonesia? (PGS Extend)**

**Supervisor: Mr S Lemieux**

Driven by my interest in biology, medicine, and their intersection with sociology, I began a research project exploring the implications of decelerated ageing - a phenomenon we are experiencing today.

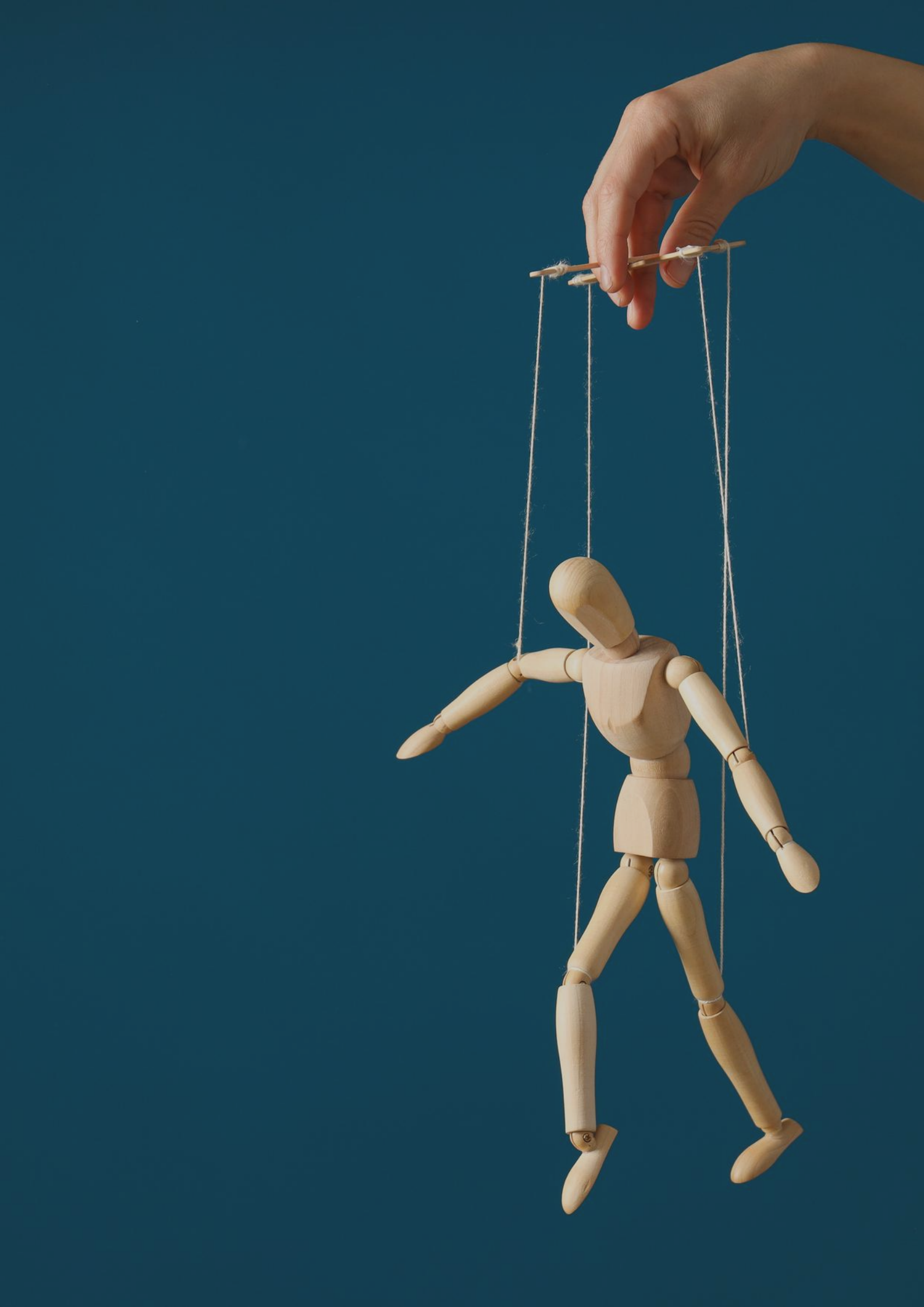
I tackled the topic with a future-oriented approach, questioning the feasibility of a country fully investing their resources into this cause. While the potential benefits, such as a faster response to epidemics and improved chronic disease management, were compelling, I encountered counter-arguments at every turn. My research revealed innumerable pre-existing and future challenges of managing an ageing population. For example, I had to consider factors directly affecting the health of the population and concerns emerging as a result of decelerated ageing, such as strain on food supplies and human resources. After carefully evaluating my sources, I arrived at the grim conclusion that, although the USA did seem to benefit more significantly than Indonesia, neither country, and in turn, possibly no country in the entire world, is prepared for such an advancement. A global, holistic approach would be necessary - yet we remain ill-equipped for such a transformation.

# Chloe M.

**Creating a jacket that is suitable for several social settings. (PGS Extend)**

**Supervisor: Mrs S Smith**

I chose to create a jacket for my PGS Extend artefact due to my own personal interest in fashion and sewing. I saw it as a good opportunity for me to develop my own sewing skills while challenging the ever-increasing rise of fast fashion trends. This led me to design and create a jacket suitable for western fashion trends that was able to remain a timeless garment while being an adaptable and stylish item within the accelerating trend cycle. Informing my design through researching past fashion trends and fashion projections, along with research into reputable sewing techniques, I was equipped to create my jacket. My project resulted in me achieving the creation of an oversized faux leather jacket, which was formulated to successfully fit most of the social environments I focused on.



# Marinela P.

**Can an economy be successful with a dictatorship? (PGS Extend)**

**Supervisor: Mrs N Neil**

My Extend Project derived from an interest in dictatorial regimes, but more specifically the factors that cause their instability and subsequent demise.

Through my research I examined the dictatorship of Qaddafi in Libya and Salazar in Portugal to create a profile for why both of these regimes lasted less than half a century. My initial conclusion was that dictatorships yielded poor economic situations which in turn created instability in the government, however I soon realised that whilst economics was one cause of instability it formed only one part of a profile of an unsuccessful government. Alongside looking at unsuccessful dictatorships, I also analysed the reasons as to why Cuba has continued to be an effective dictatorial regime. The broad judgement I made from my research was that dictatorships fall because the people that are subjected to them grow tired of being ruled by tyranny and that the very design of a dictatorship is not designed to outlast the leader who founded it.

# Rowan R.

**Design, reconstruct and play the Ancient Egyptian board game 'Hounds and Jackals'. (EPQ)**

**Supervisor: Mr P Gamble**

My EPQ was to create a reconstruction of the Ancient Egyptian board game 'Hounds and Jackals', adapting it slightly to be better understood by a modern audience. The game is a little similar to Snakes and Ladders, with dog and jackal shaped game pieces. I made my reconstruction of the game from air-drying clay, painting it using natural pigments, and using various examples of the game in museums as a reference. After this I tested whether the board game was easy and fun to play by choosing a group of volunteers to play it, using rules that I had extrapolated based on the game's design and the rules of similar ancient games.

# Sabiha S.

**How effective is psychosurgery at treating major depressive disorder?. (EPQ)**

**Supervisor: Mrs S Pye**

Seeing that 5-10% of the global population suffers from major depressive disorder (MDD), with 60% finding their treatment unsatisfactory, I wondered whether more effective alternatives to psychotherapy and antidepressants existed. My interest in the failed psychosurgical treatments of the 1900s led me to explore whether their resurgence in the form of advanced lesional procedures and modern neuromodulation techniques could offer a more effective approach.

To assess their efficacy, I analysed 19 sources, including medical journals, articles, and books. I explored the history of lesional and stimulation-based psychosurgical procedures for MDD, evaluating postoperative mortality rates, complications, long-term outcomes, and classification criteria for MDD. Additionally, I studied brain structures relevant to symptom relief.

From my research, I found that neuromodulation techniques, such as deep brain stimulation and electroconvulsive therapy, significantly improved treatment outcomes when targeting brain regions like the nucleus accumbens and anterior cingulate cortex, which regulate motivation, anxiety, and stress. Furthermore, accuracy improved when combined with functional imaging and stereotactic techniques refined from psychosurgery. While lesional surgery has shown potential, a lack of sufficient evidence makes it an unreliable option and thus a last resort. In contrast, neuromodulation has demonstrated greater effectiveness in treating MDD.

# Nikhil S.

**What are the effects of chillies on human health especially with reference to cancer prevention. (EPQ)**

**Supervisor: Ms A Casillas-Cross**

This specific topic stems from a debate I had with my mother about the validity of an online article claiming that the overconsumption of chillies is linked to cancer.

I am very interested in biochemistry and how it affects us on a cellular level. Delving deeper into the topic, I was surprised and delighted to find that there is an enormous amount of research on the biomedical potential of chillies and the capsaicin that it contains, which allayed my initial concerns about the topic being too niche. During my research, I spent time reading scientific journal articles from various online databases like the National Institute of Health and PubMed. After carefully evaluating 46 articles and identifying two strands of arguments about the risks and benefits of using capsaicin in cancer treatments, I concluded that the “double-edged” nature of capsaicin means that there is currently no viable method to safely administer an efficacious dose. However, its use in tandem with anti-cancer therapies continues to be a promising area of research, and one which I will follow closely.

THE PORTSMOUTH GRAMMAR SCHOOL

# Extended Project and EPQ Celebration Evening

**Wednesday 26th February 2025**