



## Participant Information Sheet

REC reference number: ETH2425-1988

Date: 01/10/2025

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Title of study: Exploring Recursion as a Threshold Concept for Novice Computer Science Students

Name of researcher: Jude Nzemeke

### Invitation paragraph

I would like to invite you to take part in a research study. Before you decide whether you would like to take part it is important that you understand why the research is being done and what it would involve for you. Please take time to read the following information carefully and discuss it with others if you wish. Ask me if there is anything that is not clear or if you would like more information. You will be given a copy of this information sheet to keep.

### What is the purpose of the study?

Recursion, a fundamental concept in computer science, involves solving problems by breaking them down into smaller instances of the same problem. Many students find recursion challenging, struggling with understanding the recursive process, tracing calls, and creating efficient solutions. This study is part of my PhD research, and it explores recursion as a Threshold Concept for novice computer science students, and how students' understanding changes when recursion is taught. The research will offer teaching recommendations, inform computer science curricula, and enhance our understanding of how students learn recursion.

### Why have I been invited to take part?

You have been invited to participate in this research as you are a Key Stage 5 student studying computer science.

### Do I have to take part?

Participation in the study is voluntary, and you can choose not to participate in part or all of the project. You can withdraw at any stage of the study without being penalised or disadvantaged in any way. It is up to you to decide whether or not to take part. If you do decide to take part, you will be asked to sign a consent form. If you decide to take part, you are still free to withdraw at any time and without giving a reason.

Kindly be aware that after anonymizing or publishing the data, the option to withdraw your data will no longer be available.

You will be able to withdraw your data up to 1st October 2026.

## What will happen if I take part?

If you choose to take part in this study, you will be involved in three short research interviews/activities over the course of about five months. These will take place at three key points in time:

- First interview – before you are formally taught recursion in class
- Second interview – during or just after you've been taught recursion (within a week or two)
- Third interview – several weeks later (around 4 to 8 weeks after the first interview)

At each of these timepoints, you'll be asked to take part in a short interview and complete a few tasks related to how you understand recursion. These activities are designed to explore how your understanding develops over time and how you feel about learning this topic.

Each session will take between 20 and 50 minutes and will happen during lunchtime in H6 or a suitable computer room in Term 1 and Term 2 (September 2025 – March 2026). I'll be there to guide and supervise each session, so you'll have support throughout.

## What are the possible disadvantages and risks of taking part?

There are several potential risks associated with conducting the survey, each with its corresponding severity and mitigation strategy.

Privacy concerns, such as the risk of exposing personal data, are also rated as low. Mitigation involves implementing measures such as anonymizing and securely protecting data, along with informing you (students) about the purpose and use of the collected information.

The risk to academic activities is low, as the survey is scheduled during break/lunch times - this is when most of the extracurricular activities are held in school, to minimize disruption during lessons. There is a medium risk to extracurricular activities that you (students) may miss out on however, the risk is further minimized as participation is voluntary.

Time management is identified as a low-risk factor, with the possibility of the survey taking longer than anticipated and affecting form-time activities. Mitigation strategies include sending you reminders, allocating sufficient time for the survey, and ensuring that IT equipment is in order before students begin.

Another potential risk is that you may feel the study assesses your individual performance in computer science which is not the case. You are reassured that the study does not measure your performance in computer science but focuses only on how students consider recursion.

Ethical considerations and approval from the City St Georges, University of London ethics committee has been obtained.

## What are the possible benefits of taking part?

While there are no immediate personal benefits to participating in this study, your involvement will indirectly contribute to the improvement of teaching and learning practices in computer science. The findings from this research will help enhance educational approaches and benefit students and teachers in the long term.

## Expenses and Payments

In appreciation of your participation, all students taking part in the study will receive a complimentary lunch (e.g. Pizza).

## Conflicts of interests

None

## What should I do if I want to take part?

Further information will be provided on the date and time the survey will be conducted.

## Data privacy statement

City St George's, University of London is the sponsor and the data controller of this study based in the United Kingdom. This means that they are responsible for looking after your information and using it properly. The legal basis under which your data will be processed is City St Georges' public task.

Your right to access, change or move your information are limited, as we need to manage your information in a specific way in order for the research to be reliable and accurate. To safeguard your rights, we will use the minimum personal-identifiable information possible (for further information please see <https://ico.org.uk/for-organisations/guide-to-data-protection/guide-to-the-general-data-protection-regulation-gdpr/lawful-basis-for-processing/public-task/>).

City St Georges will use your name and contact details to contact you about the research study as necessary. The only people at City St Georges who will have access to your identifiable information will be Senate Research Ethics Committee. City St Georges will keep identifiable information about you from this study for 5 years after the study has finished.

You can find out more about how City St Georges handles data by visiting <https://www.city.ac.uk/about/governance/legal>. If you are concerned about how we have processed your personal data, you can contact the Information Commissioner's Office (IOC) <https://ico.org.uk/>.

## What will happen to the results?

The outcomes of this study will be incorporated into my PhD thesis/report and may be published by reputable research-focused publishers. Rest assured that all information will be anonymized to protect the confidentiality of participants.

## Who has reviewed the study?

This study has been approved by City St Georges, University of London Research Ethics Committee.

## What if there is a problem?

If you have any problems, concerns or questions about this study, you should ask to speak to a member of the research team. If you remain unhappy and wish to complain formally, you can do this through City St Georges complaints procedure. To complain about the study, you need to phone 020 7040 3040. You can then ask to speak to the Secretary to Senate Research Ethics Committee and inform them that the name of the project is Addressing Novice Students' Misconceptions in Recursive Algorithm Learning.

You can also write to the Secretary at:

Annah Whyton  
Research & Enterprise Office  
City St Georges, University of London  
Northampton Square  
London, EC1V 0HB  
Email: [senaterec@city.ac.uk](mailto:senaterec@city.ac.uk)

### **Insurance**

City St George's, University London holds insurance policies which apply to this study, subject to the terms and conditions of the policy. If you feel you have been harmed or injured by taking part in this study, you may be eligible to claim compensation. This does not affect your legal rights to seek compensation. If you are harmed due to someone's negligence, then you may have grounds for legal action.

### **Further information and contact details**

Researcher: Jude Nzemeke; email: [jude.nzemeke@citystgeorges.ac.uk](mailto:jude.nzemeke@citystgeorges.ac.uk)

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**Thank you for taking the time to read this information sheet.**