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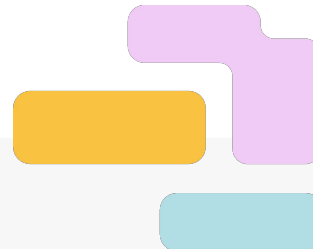


RASPBERRY PI
COMPUTING EDUCATION
RESEARCH CENTRE

Research Design

An introduction to the TICE project

Teacher Inquiry in Computing Education (TICE)



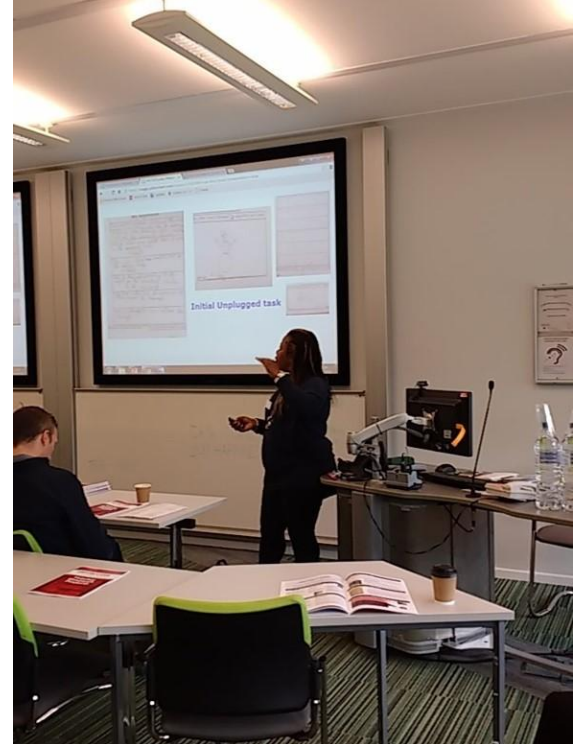
Teacher research in computing

As teachers, it can be transformative to practice to investigate what might improve your practice.

In the case of computing in school there's even more reason to do this. We've all been learning how to teach it and there isn't a huge amount of research available.

However, there are barriers: time, confidence, expertise ...

That's why we created the Teacher Inquiry in Computing Education project. In this project, we want to help to facilitate teachers wanting to engage in small-scale computing education inquiry projects, either through partnerships with researchers, or through our new self-study option.





An introduction to the Teacher Inquiry in Computing Education project

Self-study option

Conduct your own research project

Help provided

- Access to online resources and videos
- Monthly email prompting you on where you should be now
- Synchronous online workshops to discuss your project

Supported option

Conduct your own research project

Help provided

- Support from a helper who is experienced in conducting research
- Access to online resources and videos
- Monthly email prompting you on where you should be now
- Synchronous online workshops to discuss your project
- One F2F day to meet your helper and present a detailed research plan, with financial support of £250

Your commitment

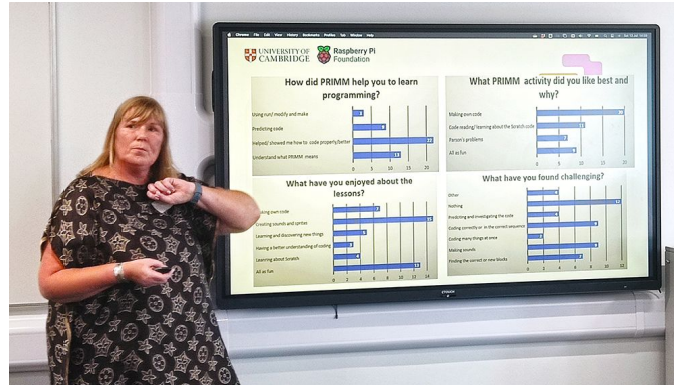
- Keep on track with the schedule
- Keep us (organisers) and your helper up to date with your progress
- Attend the F2F day
- Write up your project

Optional (but recommended)

- Present your work at the CAS Conference

Objectives of this video

- o Start to identify the area of research
- o Consider how this might be achievable
- o Find out about logistics and resources



Essential reading for the TICE project!

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Teacher Research Projects

July 2024

Project reports from the Teaching Inquiry in Computing Education (TICE) project 2023/2024

Published in July 2024 by the Raspberry Pi Computing Education Research Centre

bit.ly/tice-booklet-2024

bit.ly/tice-resources

Teacher Inquiry in Computing Education (TICE)



Welcome to the **Teacher Inquiry in Computing Education (TICE)** project, which is organised by the [Raspberry Pi Computing Education Centre](#) and supported by [Computing At School \(CAS\)](#) as well as volunteers from several UK universities.

The TICE project supports computing teachers in conducting action research projects within their schools as part of their classroom activity.

These pages are the starting point for your own project, whether you're taking part in the supported or self-study route. Find out more about the TICE project in general, explore what is involved in an action research project and access all the resources and materials you need for a successful project.

[Get started with your research](#)

TICE 2024-25



Finding a research topic

Two main types of research project

Investigation

Finding something out without making a change, e.g. *what is the difference between children in year X and children in year Y with respect to their beliefs about the internet/AI/....?*

Intervention

Making a change and then gathering data or reflecting about what then happens, e.g. *does using X approach to teach Y increase students' engagement?*

Research questions should be specific and measurable

Does using PRIMM help program comprehension?

Too vague - add a target group

Does using PRIMM for Year 8 help program comprehension?

Quite a big task!

Does using a targeted predict exercise at the beginning of Year 8 programming lessons help program comprehension?

What about time period

Does using a targeted predict exercise at the beginning of all year 8 programming lessons for 4 weeks help program comprehension?

Is this realistic?

Does using a targeted predict exercise at the beginning of year 8 programming lessons for 4 weeks help my students explain their programs orally during the lesson? ETC

Use reports from 2024 for inspiration



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Data collection

Options

- Questionnaires
- Focus groups or interviews (qualitative data)
- Documents (textbooks, curricula, student homework)
- Digital artefacts
- Journalling
- Structured observations
- Log data (e.g. Moodle)

Questions to ask yourself

- Am I only collecting the data I need to answer my question (very easy to over scope)
- Are my questions free of bias and my own expectations?
- Am I aiming for a representative sample, or is my data collection more in-depth about one or two cases?
- What do I need help with?

Ethical research

You should ensure that for any inquiry project you carry out in your school:

- o You have the permission of your headteacher to collect data about the pupils
- o The intervention will not harm, disadvantage or have any negative effect on the pupils
- o Children (or parents) give informed consent if appropriate (ie something different to normal lessons)
- o Children are not under pressure to participate in any research activity

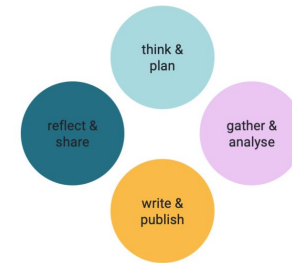
The main source of guidance is the [BERA Educational Guidelines](#)

Next steps

1. Bookmark the TICE resources page here:
bit.ly/tice-resources
2. Read through the Research Design section
3. Write a plan using the following headings
 - a. Describe your investigation or intervention
 - b. What outcomes are you looking to observe?
 - c. What is your context (type of school, characteristics of your context)
 - d. What is your target population (what year group, what topic, students or teachers, etc.)
 - e. What are the next steps
4. A template is available on our web pages



The research process



The research process is often depicted as a cycle with several steps that researchers move through as they work on their project. There is no prescribed way of doing research, but there are some key stages that will be similar in each project. Most projects begin with a broad question, theme, idea, or hypothesis. In the next steps, the researcher explores and refines their work into a clear and specific research question.

Selecting the topic of interest

The topic is the general area of enquiry. When deciding on the general topic for your project, we recommend choosing an area of interest to you, as this will have a direct impact on your motivation.

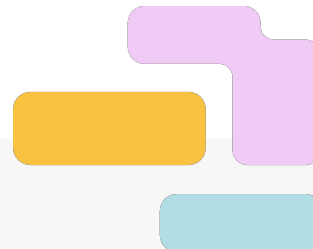
Examples from an educational context might be:

- Enhancing programming skills
- Improving computational thinking
- Integrating technology in the classroom
- Promoting inclusivity and diversity
- Assessing learning and progress
- Developing soft skills
- Curriculum development
- Use of emerging technologies
- Teacher professional development
- Student motivation and engagement

Further reading

Resources to help you get started:

- An [action research course](#) from School Education Gateway
- Tips for creating questionnaires:
<https://blog.optimalworkshop.com/write-great-questions-research/>
- Validated questionnaires that you can use:
<https://csedresearch.org/resources/evaluation-instruments/>
- [Understanding the research process](#) (PDF)



**Good luck with this stage of
your teacher inquiry project!**

