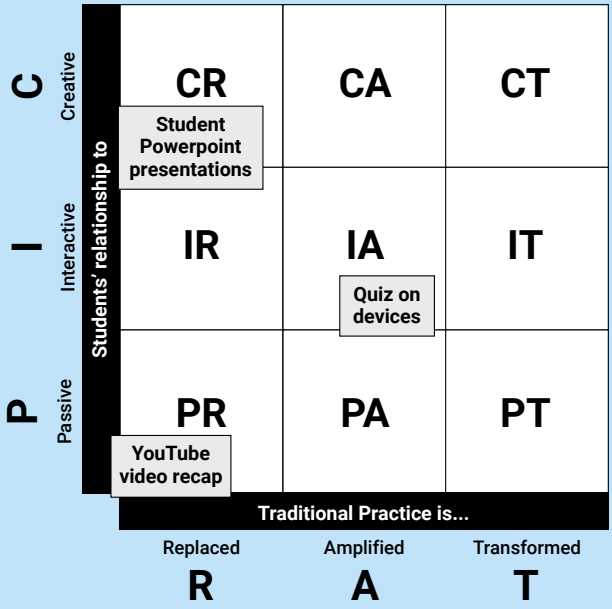
Raspberry Pi Foundation

Pedagogy Quick Read

Using the PICRAT framework to evaluate and improve technology integration in teaching

PICRAT was designed as a student-focused, pedagogical framework to help student teachers evaluate how they use technology in their teaching. It has grown into a cross-discipline tool that can help educators at any stage of their careers to continually improve how they integrate technology into their practice.



Adapted from Kimmons, Graham, and West (2020).[1]

What are conceptual frameworks for technology integration?

Approaches to technology integration in teaching can be "messy, complex and unstructured".[1] Our expectations of technology and the technology available are constantly changing, and teachers must make decisions based on context, subject content, and the age of their students. Therefore, researchers have created different theoretical models that aim to help teachers (especially student teachers) to reflect on and understand technological integration and improve their practice. Educators might already be familiar with some of these frameworks, for example:

- TPACK (Technology, Pedagogy, and Content Knowledge)[2]
- SAMR (Substitution, Augmentation, Modification, Redefinition)[3]

PICRAT builds on the existing RAT model[4] and was created after researchers found gaps in others models. They concluded that a clearer, teaching-compatible model was needed — one that treats technology as a tool, not the goal, and that focuses on students.

Summary

PICRAT is a **matrix tool** that allows teachers to reflect on **how effectively they are using technology**.

PIC runs along the y axis, and RAT along the x axis.

PIC: Students' use

PIC refers to how **students** experience the technology used in their learning. It stands for **Passive, Interactive, Creative**.

- **Passive**: Students receive learning through technology.
- **Interactive**: Students interact with the content or other learning through technology.
- **Creative**: Students construct knowledge using technology.

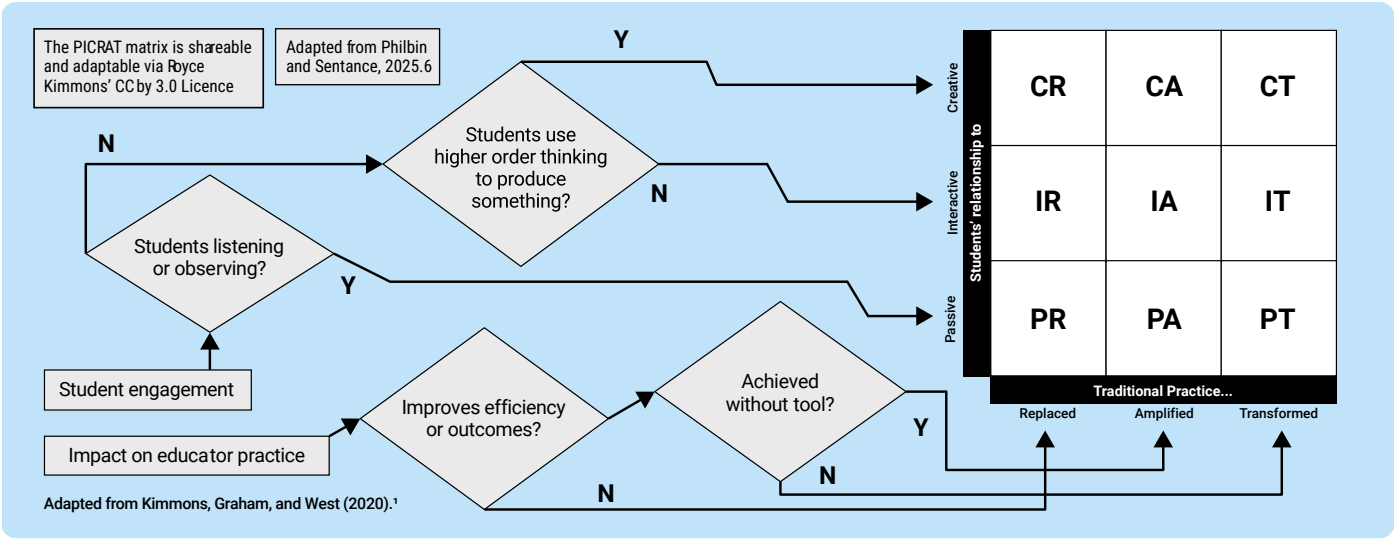
RAT: Teacher practice

RAT refers to the impact of the chosen technology on the **teacher's practice**. It stands for **Replacement, Amplification, Transformation**.

- **Replacement**: Using technology but with an existing pedagogy.
- **Amplification**: Using technology to improve pedagogy or outcomes.
- **Transformation**: Using technology to create new pedagogical practices.

Using PICRAT

PICRAT is a self-reflection tool that helps teachers to reflect on lesson plans, see where their use of technology sits, and explore how they might expand it. Each position on the matrix has value for different educational purposes, but the matrix is hierarchical. The goal is for teachers to move their practice towards 'Creative' in terms of how students are using technology and 'Transformation' in terms of how the chosen technology impacts the teacher's practice. Royce Kimmons (one of the authors of the original research) has produced a useful explainer video[5] on the PICRAT model.



Examples of PICRAT application

The image on the first page gives the example of a history lesson taught to 12- to 13-year-olds. From this, a teacher may identify the following:

- Using a YouTube video to recap previous historical events – the student experience is passive, and the technology use is replacement (the content could be covered by the teacher)
- A multiple choice quiz presented to students on their tablets or devices – the student experience is interactive and the technology use is amplification (the teacher is able to see student responses in real time, meaning they can give more effective and accurate feedback)
- Students create slide-based presentations and present them – the student experience is creative and the technology use is replacement (previously students would have made a verbal presentation)

You can find more ideas for technology integration for different ages and school subjects by using tools like the PICRAT Matrix Generator.

The PICRAT model's creators believe it presents an excellent opportunity for discussion and reflection. By discussing the above examples, the teacher may reflect on the following:

- What does the presentation tool offer that could be used to amplify their practice? What benefits would this have for students?
- Does the technology present opportunities for students to interact with each other, not just the technology? What technological tools might support collaboration?

Research on the application of the PICRAT model highlights that teachers are unlikely to use technology in a way that allows students to be creative and which transforms their practice.[7] By using this matrix, teachers can identity missed opportunities, seek out ways to expand their technological approaches, and have a greater impact on student learning.

Why use the PICRAT framework?

- The PICRAT matrix is designed to support you to reflect on the use of ever-evolving technology while **focusing on the student experience and pedagogies**, rather than just trialling the latest technology.
- **All squares on the matrix are valid and will suit different learning needs**, but using the matrix can help teachers identity when they could push their practice higher up the hierarchy to transformation of their pedagogy and creative student use.
- **Using the matrix collaboratively** with other educators leads to self-reflective practice and the sharing of approaches and tools that can enhance your own practice.
- The matrix means that **teachers have a shared language** with other educators to support discussion and reflection about technology integration.

This resource by the Raspberry Pi Foundation is licensed under CC BY-NC-SA 4.0. To view a copy of this licence, visit https://creativecommons.org/licenses/by-nc-sa/4.0/.

References

[1] Kimmons, R., Graham, C. R., & West, R. E. (2020). The PICRAT model for technology integration in teacher preparation. the-cc.io/qr29_1
[2] Koehler, M. J., & Mishra, P. (2009). What is technological pedagogical content knowledge? the-cc.io/qr29_2
[3] Puentedura, R. R. (2003). A matrix model for designing and assessing network enhanced courses. the-cc.io/qr29_3
[4] Hughes, J., Thomas, R., & Scharber, C. (2006). Assessing technology integration: The RAT – Replacement, Amplification, and Transformation – framework. the-cc.io/qr29_4
[5] Kimmons, R. (2016). PICRAT for Effective Technology Integration in Teaching. the-cc.io/qr29_5
[6] Philbin, C.A. and Sentance, S. (2025). Student Use and Teacher Practice: A Scoping Review of Generative AI in Computing Education Using PICRAT. the-cc.io/qr29_6
[7] Sung, W., An, H., & Thomas, C. L. (2024). PICRAT Analysis of Technology-Integration Activities in U.S. K–12 Public Schools. the-cc.io/qr29_7

Raspberry Pi Foundation