Presented by Dr Marsia Bealby

From Ancient Egypt to Decolonising the History of Mathematics Curriculum

Everything we know about the past survives by accident.

Everything we teach about the past survives by intention.

Introduction

Dr Marsia Bealby

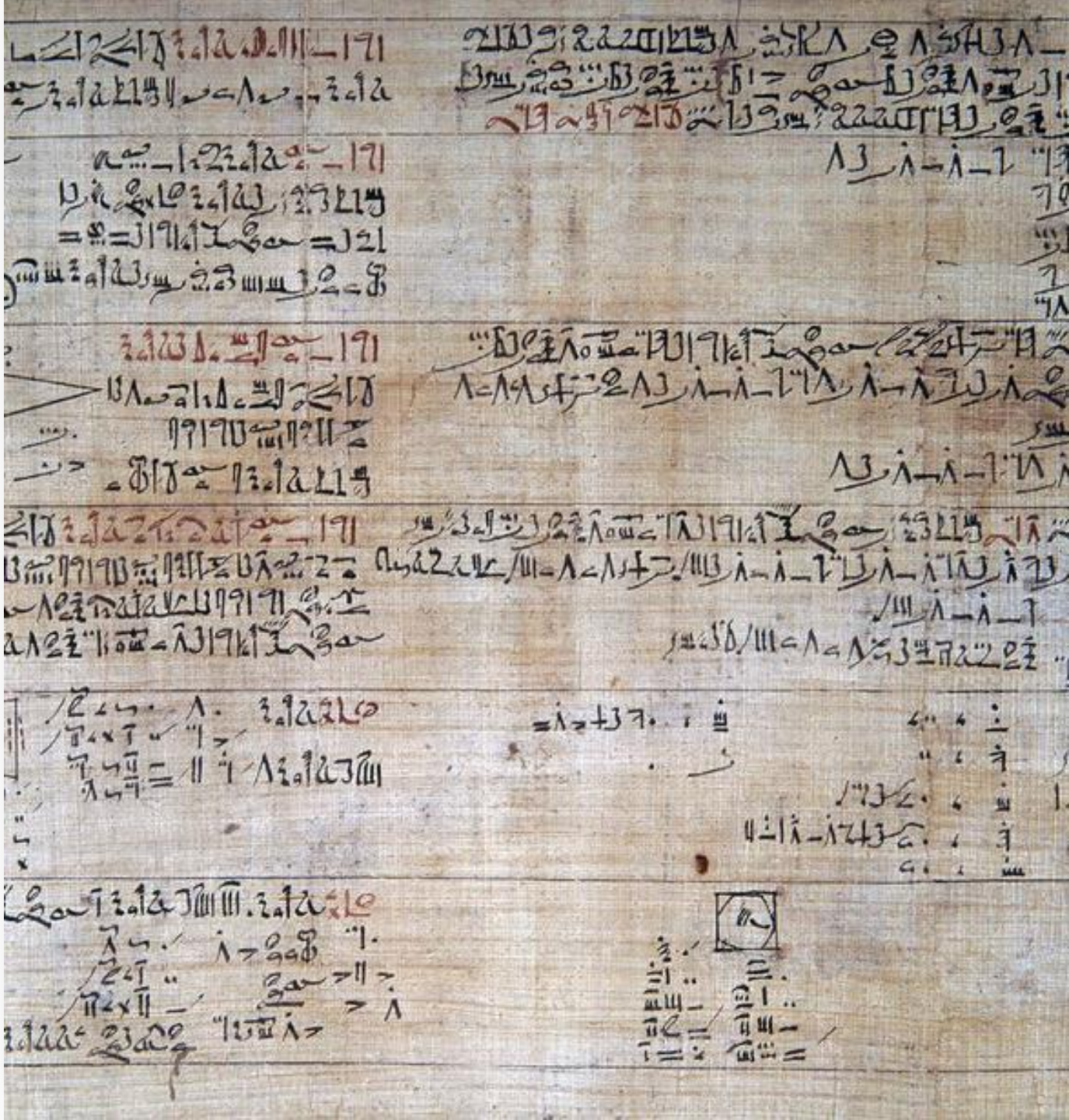
Ph.D in Archaeology, University of Birmingham. Specialism in Ancient Greece and Ancient Egypt.

Recently completed a Master's degree in Tertiary and Higher Education at the University of the Highlands and Islands.

University teaching and mentoring, career advising, research ethics (University of Warwick, University of Birmingham, University of the People).

I am using the Rhind Papyrus to show how decolonising the curriculum starts by rethinking how we frame ancient knowledge for students.

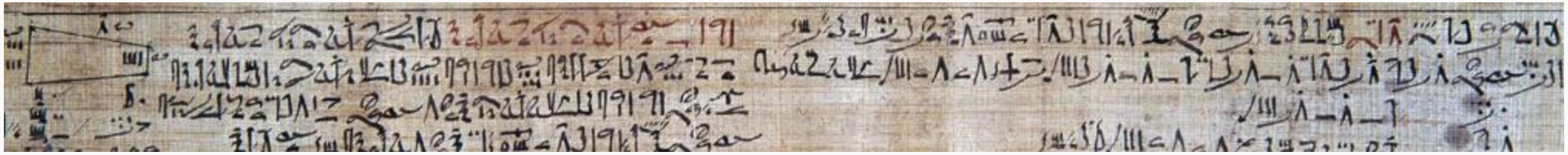
- The Rhind Papyrus contains 84 practical problems, from pyramid slopes to measuring bread, beer, and grain. It shows how ancient Egyptians calculated, checked quantities, and ensured accuracy in daily and state life.
- About 3,500 years old and originally 5 meters long, it reflects a highly trained administrative system where scribes and builders needed strong mathematical skills.



Written by scribe Ahmose in hieratic script with red headings and worked solutions, it presents practical mathematical knowledge for Egyptian state careers.

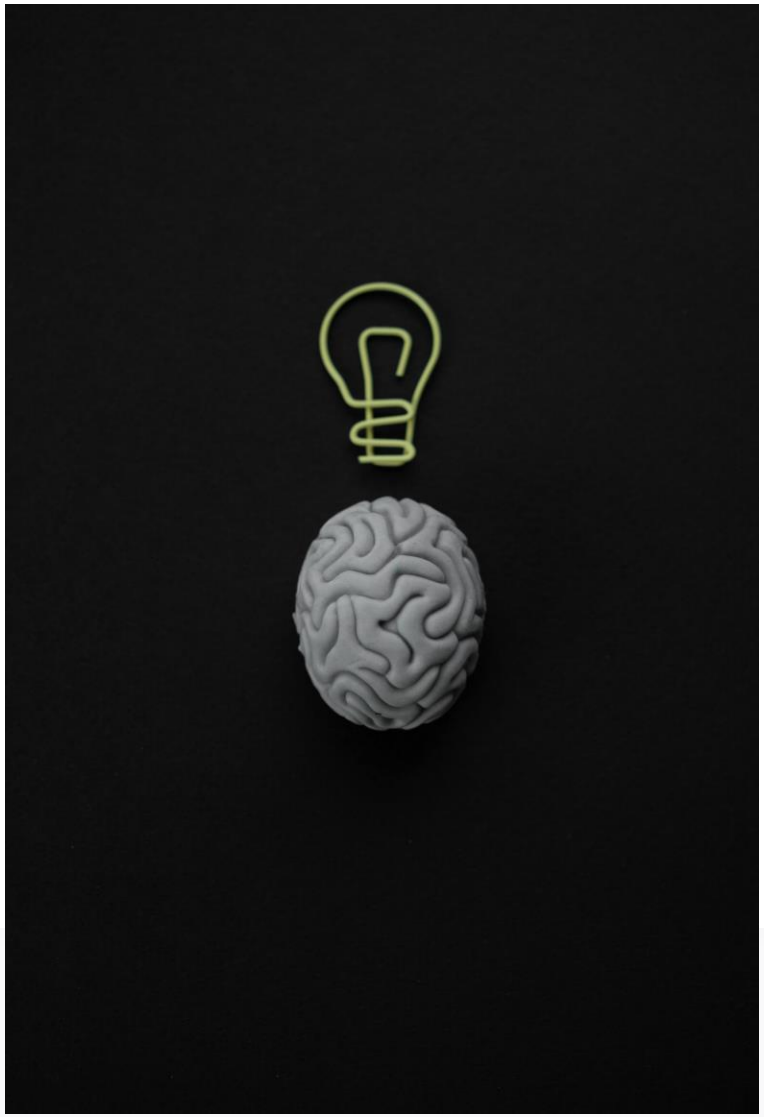
It was used to train scribes in essential calculations for administration, building projects, and rationing.

The mathematics in Rhind Papyrus is mostly practical and elementary by modern standards.



Using historical sources such as the Rhind Mathematical Papyrus shows that Mathematical knowledge has diverse origins and offers a practical pathway for decolonising curriculum design.

Decolonisation is about representation, restoring epistemic justice, and challenging the myth of a single mathematical lineage.



Theory

Teaching approach that encourages students to question dominant knowledge, power structures, and whose perspectives shape what is taught.

It positions education as a tool for critical awareness and social change rather than passive knowledge transfer.

Critical Pedagogy (Tutak et al., 2011; Cooper, 2015; Seal and Smith, 2021)

Making learning more meaningful and inclusive by connecting it to diverse cultural perspectives and experiences, and by making sure that different knowledge systems are represented in the curriculum.

Representation – including knowledge from various cultures

Relevance – link to real-word context

Inclusion – all students feel that they belong

Critical awareness - encouraging reflection on whose knowledge is taught and why

Culturally Responsive Teaching (Larke, 2013; Cochrane et al. 2017; Hutchison and McAlister-Shields, 2020)

All knowledge systems should be recognised and valued fairly, no group's knowledge should be ignored or marginalised.

(Re-)intoducing excluded knowledge.
Not replacing one canon with another, but broadening the picture!

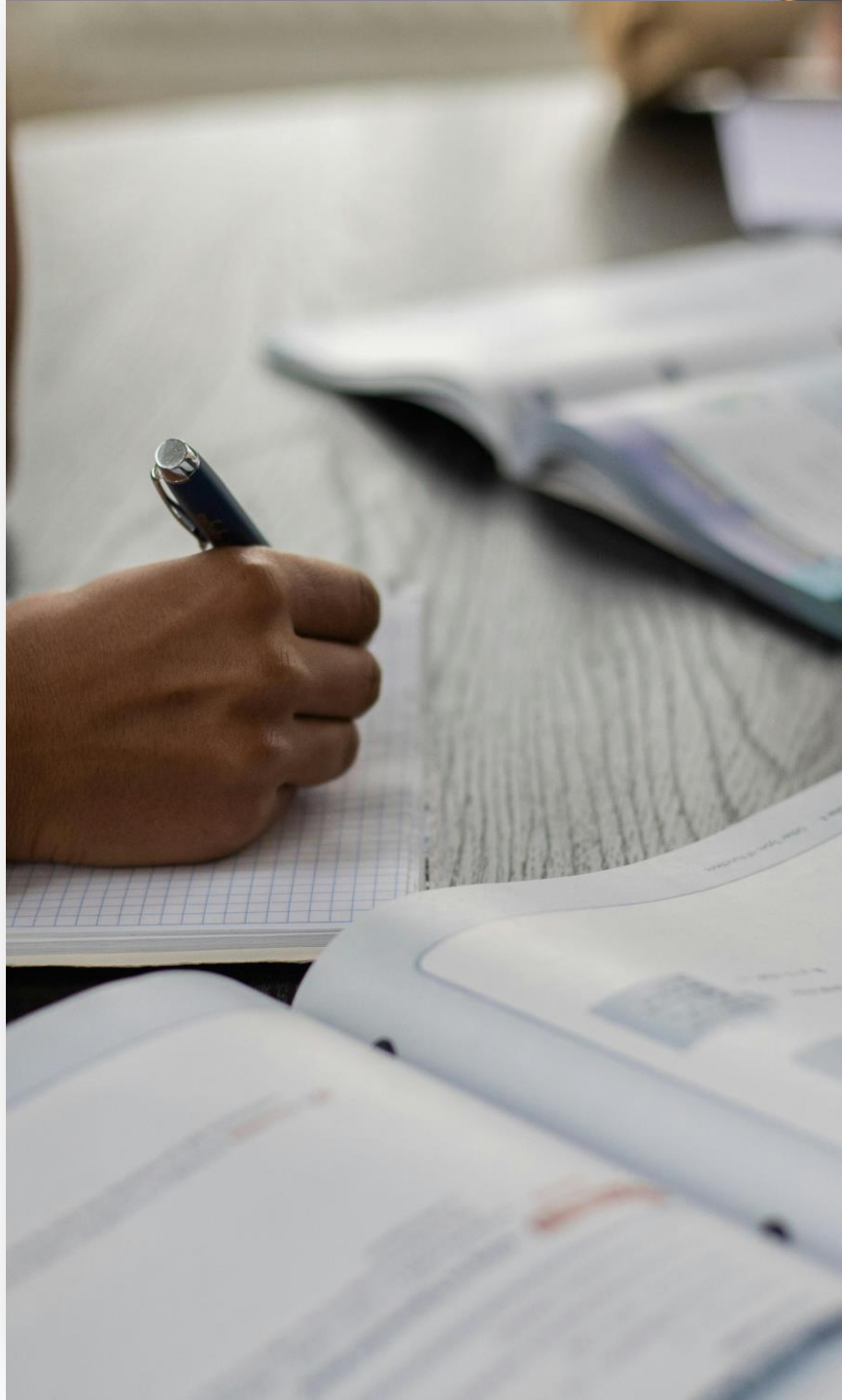
Restoring Epistemic Justice (Tanswell and Rittberg, 2020)

Why this papyrus matters

1. Demonstrates advanced mathematical thinking outside Greece / Europe. Shows multi-origin histories of mathematics.
2. Disrupts linear Eurocentric narratives. Challenges the narratives that mathematics "began" with Greek civilisation, and the traditional curriculum that often follows Greece-Renaissance Europe-Modern West.
3. Pedagogical tool that enables educators to rethink how mathematics is taught, understood and placed within global knowledge systems.

What can I do with this papyrus?

1. The papyrus is your vehicle, not the focus. Think about modern pedagogical theory and practice.
2. Ask students to take problems and compare them with modern methods, globally. Use these problems in method design (Inquiry-based learning & Culturally Responsive Reaching).
3. Ask students to compare approaches over space and time. There are multiple valid ways of teaching mathematically (Culturally Responsive Teaching).
4. Show your students alternative mathematical reasoning systems (Critical pedagogy & Restoring Epistemic justice).



What can I do with this papyrus?

5. Ask your students: *Who produces mathematical knowledge? Why does this papyrus matter? Why does the history of the item matter* (e.g. who has published on it)? (Critical Pedagogy).

6. Explain to your students the importance of decolonizing the mathematics curriculum (Critical Pedagogy & Restoring Epistemic Justice).

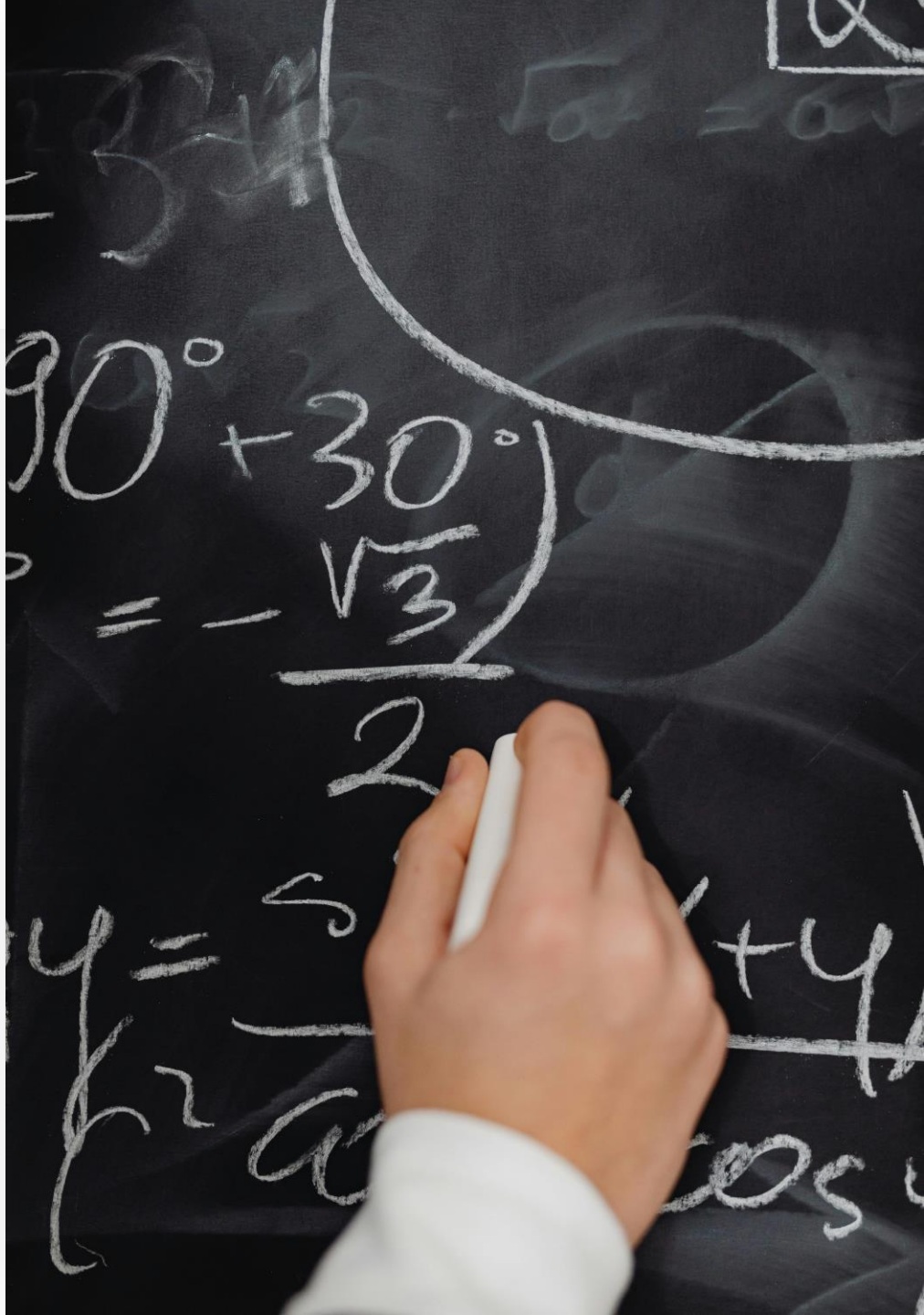
7. International classroom: help your students see themselves in knowledge systems (Critical Pedagogy & Restoring Epistemic Justice).

What can I do with this papyrus?

8. Ask your students: *Who decides what counts as "important mathematics"? Why did you study Euclid at school, but not Egyptian mathematics? What knowledge has been ignored or marginalised?* (Critical Pedagogy)

9. Help your students understand that mathematics is not owned by one tradition (Culturally Responsive Teaching).

10. Help them understand that mathematics is not neutral. It reflects power and history, and Education should challenge dominant knowledge structures (Critical Pedagogy).



Suggested assignment prompt (AI-proof; for late first year / second year undergraduates).

Suggestion: mark with marking rubric based on the prompt instructions.

The Rhind Mathematical Papyrus provides evidence of mathematical activity outside the traditional Greek–European narrative.

Using one example from the papyrus discussed in class:

1. Explain the mathematical idea illustrated by the example (in modern terms).
2. Analyse how this example challenges common narratives about the development of mathematics.
3. Evaluate how the inclusion of such material could change the way mathematics is understood by students today.
4. Support your answer with reference to your own learning experience in mathematics.

(1,000–1,200 words)

Importance

The importance of teaching about the Rhind papyrus is both symbolic and pedagogical. It is less about teaching ancient Egyptian mathematics and more about using this papyrus to broaden students' understanding of mathematics as a culturally diverse, globally developed discipline.

Thank you!

Let's connect: Dr Marsia Bealby | LinkedIn

Suggested reading

Aslan Tutak, F., Bondy, E. and Adams, T.L. (2011) 'Critical pedagogy for critical mathematics education', *International Journal of Mathematical Education in Scienc eand Technology*, 42(1), pp. 65–74.

Cochrane, S.V., Chhabra, M., Jones, M.A. and Spragg, D. (2017) *Culturally responsive teaching and reflection in higher education*. London: Routledge.

Cooper, C. (2015) 'Critical pedagogy in higher education', in Cooper, C., Gormally, S.and Hughes, G. (eds.) *Socially just, radical alternatives for education and youth work practice*. London: Palgrave Macmillan.

Hutchison, L. and McAlister-Shields, L.C. (2020) 'Culturally responsive teaching: Its application In higher education environments', *Education Sciences*, 10, p. 124.

Miatello, L., 2025. Explaining an Untidy Variant Algorithm in the Rhind Mathematical Papyrus. *The Journal of Egyptian Archaeology*, 111(1-2), pp.337-341.

Larke, P. (2013) 'Culturally responsive teaching in higher education: What professors need to know', *Counterpoints*, 391, pp. 38–50.

Seal, M. and Smith, A. (2021) *Enabling critical pedagogy in higher education*. 1st edn. London: Routledge.

Tanswell, F.S. and Rittberg, C.J. (2020) 'Epistemic injustice in mathematics education', *ZDM Mathematics Education*, 52, pp. 1199–1210.