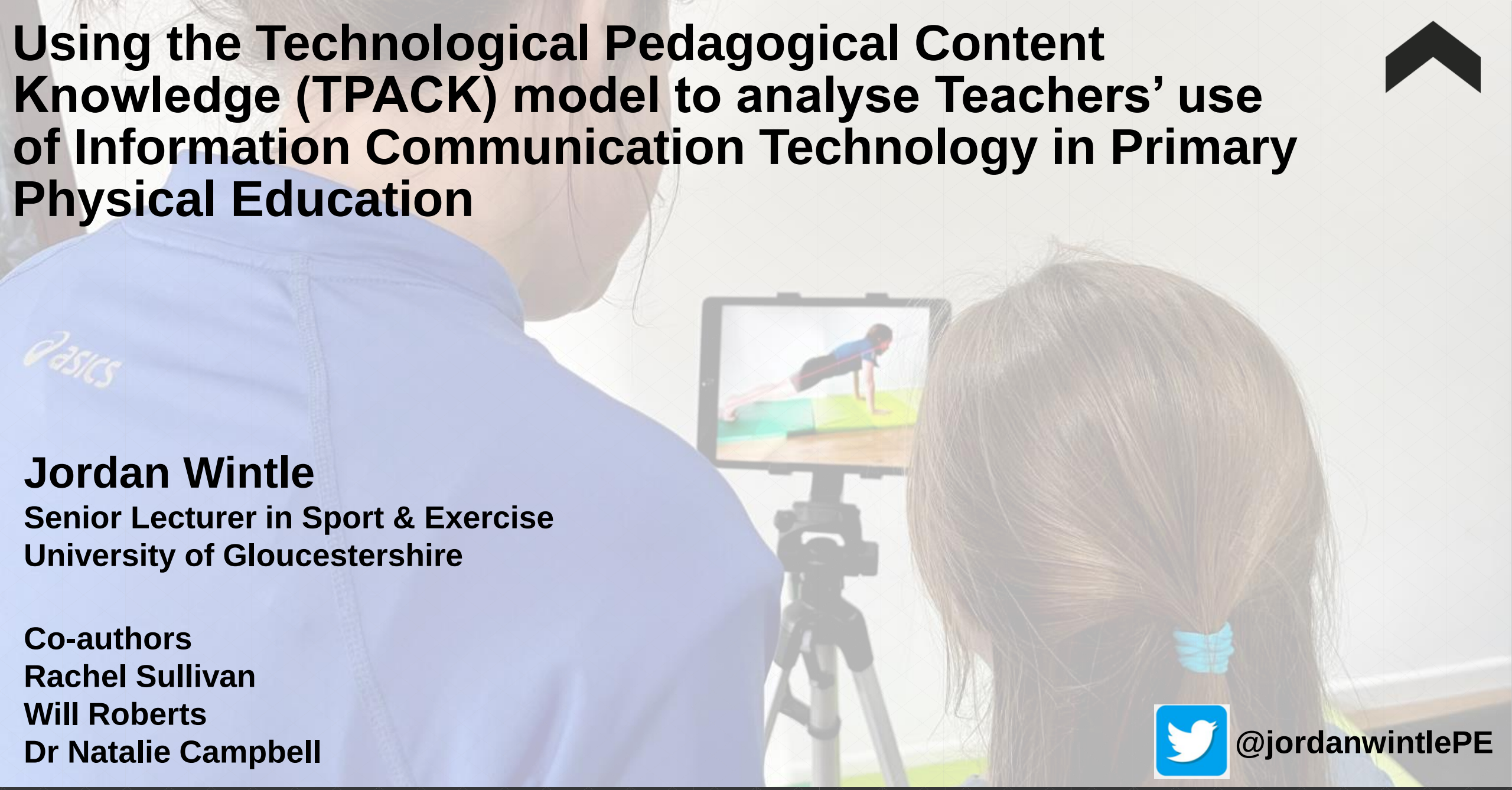
Using the Technological Pedagogical Content Knowledge (TPACK) model to analyse Teachers' use of Information Communication Technology in Primary Physical Education



Jordan Wintle
Senior Lecturer in Sport & Exercise
University of Gloucestershire

Co-authors
Rachel Sullivan
Will Roberts
Dr Natalie Campbell

@jordanwintlePE

Research Team

Rachel Sullivan
Senior Lecturer in Education
University of Gloucestershire

Jordan Wintle
Senior Lecturer in Sport & Exercise
University of Gloucestershire

Will Roberts
Senior Lecturer in Sport
University of Waikato

Dr Natalie Campbell
Wellbeing Specialist
Measurement & Research TikTok

Background – The Primary PE Landscape

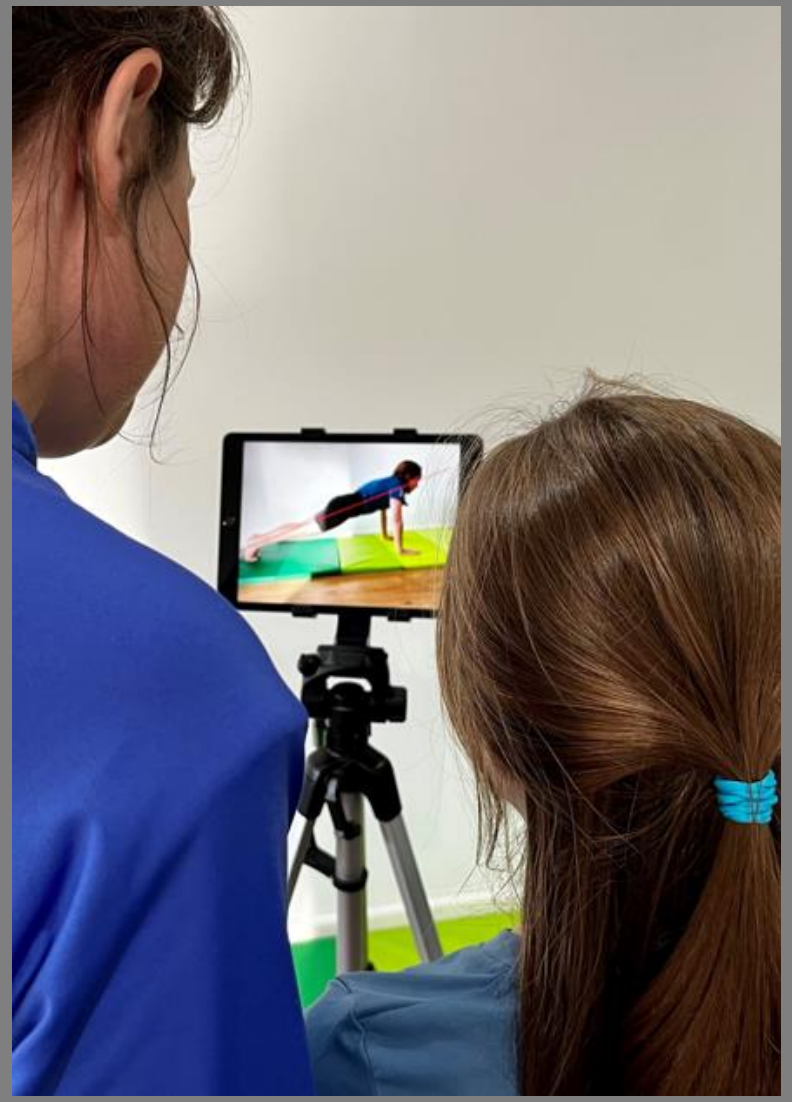
- Increased attention across societal, political, professional and academic contexts (Carse, et al., 2018; Jess et al., 2017; Roberts, et al., 2018)
- Research from across the world consistently reports problems with the quality of primary physical education (Griggs, 2007; Morgan & Bourke, 2008; Tsangaridou, 2012)
- High levels of outsourcing as a result of the primary premium funding (Cope, et al., 2015: Jones & Green, 2017)
- Lack of teacher training and quality CPD for teachers (Choi, et al, 2021; Sloan, 2010)

Background – ICT Use in Primary Education

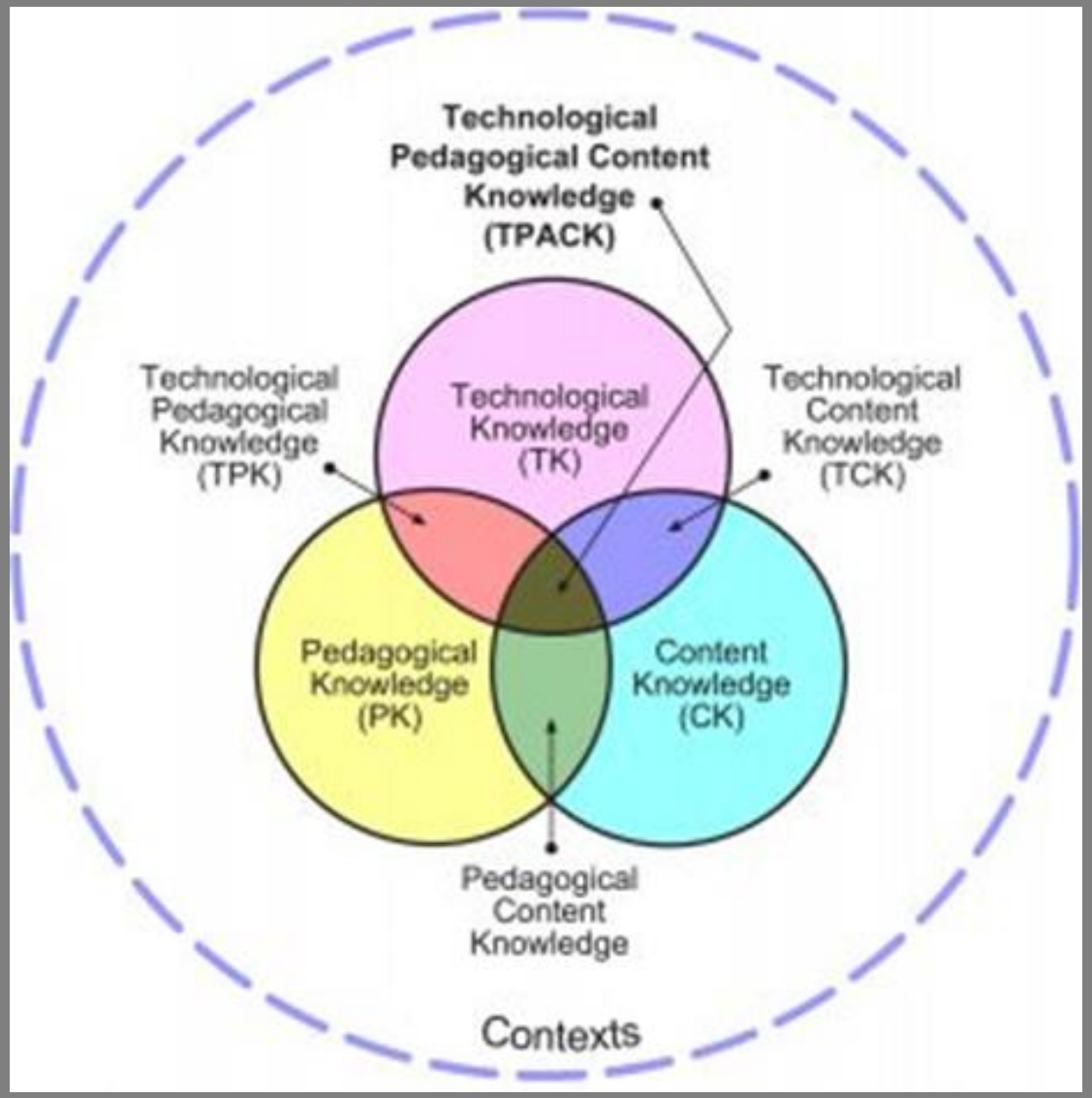
- Official guidance recommends that practitioners give opportunities for children to use ICT through the subject of ICT and through the use of ICT across the curriculum (Department for Education, 2018; Lewin, et al., 2019)
- Research evidence assessing the impact of digital technologies on learning consistently identifies positive benefits (Higgins et al., 2012; Wijnen, et al., 2021).
- Some issues with access to technology, however most teachers were positive about the potential for technology to support children's learning, with engagement rated at the most common benefit. (Picton, 2019).
- Some gender differences in attitudes towards ICT integration in primary teaching (Marbán & Mulenga, 2019)
- More studies related to TPACK enactment in real-life practice are needed to understand the nature of TPACK (Rosenberg & Koehler, 2015)

Background – ICT Use in (Primary) PE

- Useful tool for assessment of movement competence (O'Loughlin, et al, 2013; van Rossum & Morley, 2018)
- Support learning in other domains (Sullivan, 2019)
- Some concerns around issues including safeguarding, accountability, reducing activity levels and set up time (Kucklick & Harvey, 2018; Gard, 2014)
- Potential for over surveillance and issues around body image (Lupton, 2013)
- Questions still remain as to how we gain maximum benefit from the array of technology at our disposal (Sargent & Casey, 2019; Wintle, 2019)

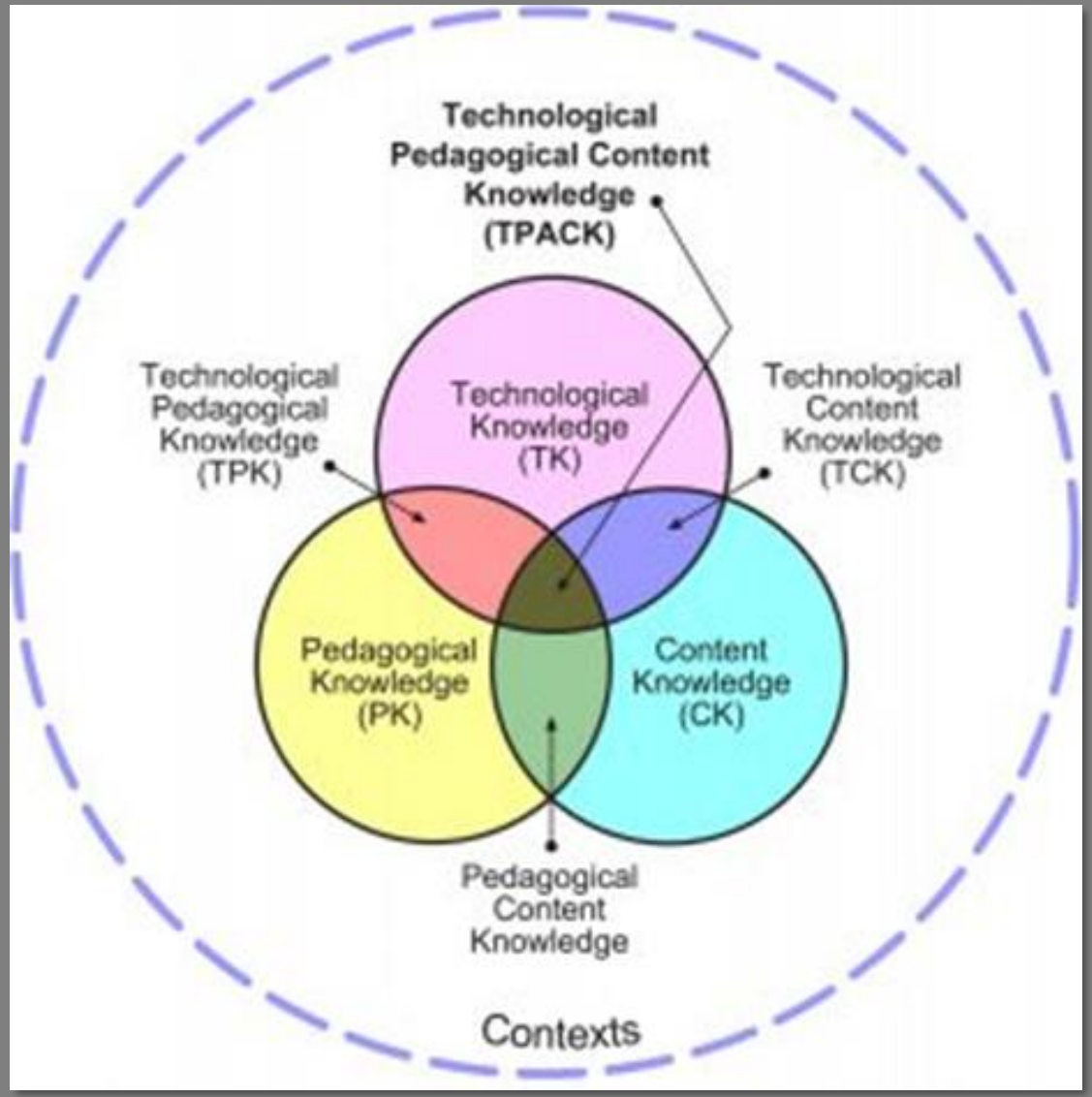


TPACK Model (Mishra & Koehler, 2006)



- The center of the diagram, otherwise known as TPACK, represents a full understanding of how to teach with technology.
- Provides a framework for the use of technology to teach concepts in a way that enhances student learning experiences.
- Important relationship between technology, content, and pedagogy, and the purposeful blending of them is key.

TPACK Model (Mishra & Koehler, 2006)

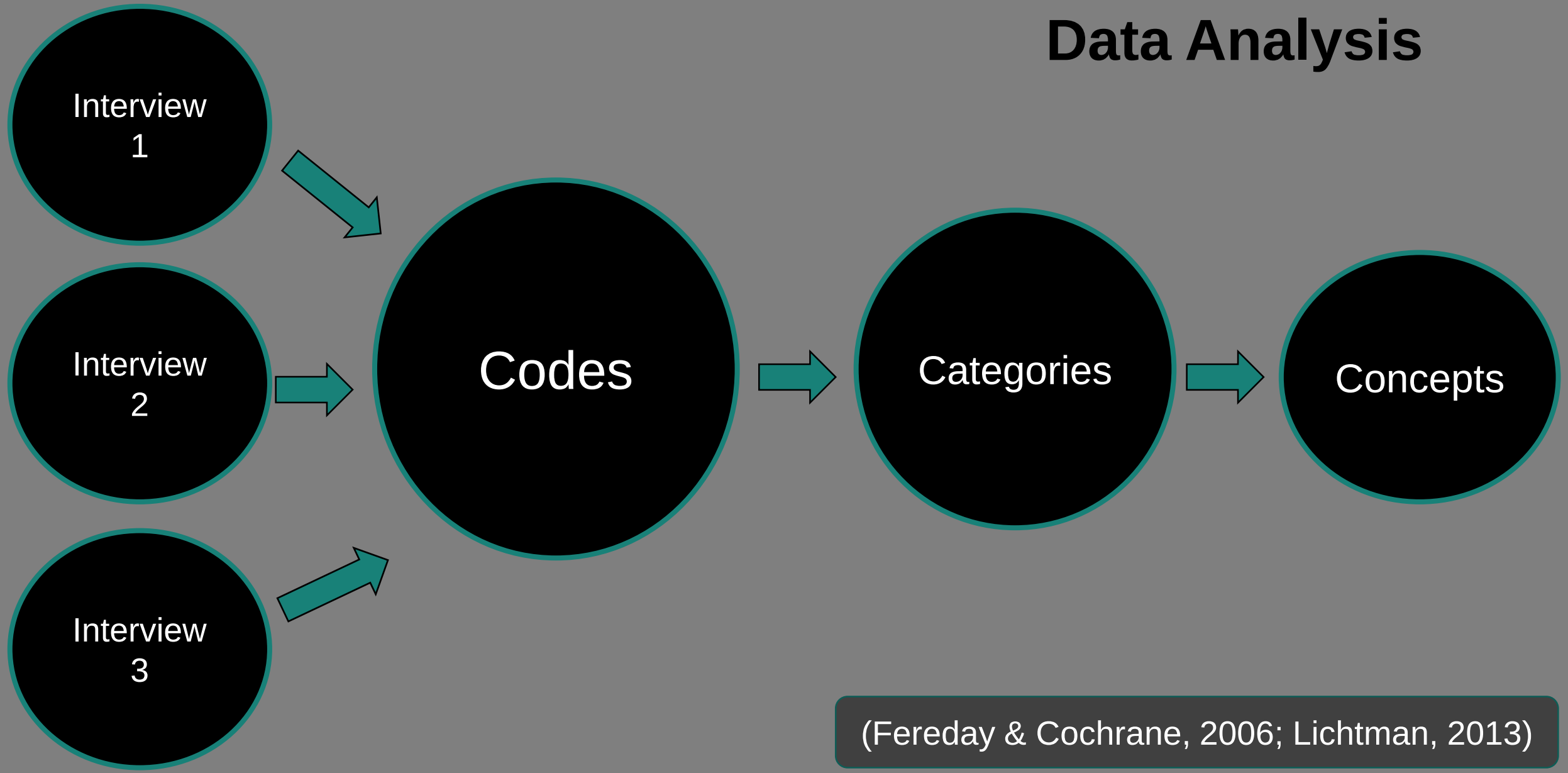


Methods – Sampling and Data Collection

Semi-structured interviews conducted by the lead researcher with 9 primary school teachers. Interview schedule derived from the literature review and TPACK model.

Teacher Age (years)	Teaching experience (years)	School size (pupils no.)	School Characteristics
33	12	<200	Independent, mixed, Wales
32	12	>400	Comprehensive, Mixed, 78% EAL, 62% FSM, Wales
33	11	>400	Comprehensive, Mixed, 78% EAL, 62% FSM, Wales
57	36	<200	Church of England, 2% FSM, Mixed, Gloucestershire
29	7	<200	Church of England, Mixed, Gloucestershire
26	4	>400	Academy, Mixed, 52% FSM, Blackpool
45	18	>200	Community School, Mixed, 37% FSM, Cheshire
25	3	>200	Academy, 16% FSM, Mixed, Oxfordshire
24	3	>600	Community School, 30% FSM, Mixed, Manchester

Data Analysis



(Fereday & Cochrane, 2006; Lichtman, 2013)

Findings & Discussion

Technology to support content knowledge	Technology for assessment	Technology to enhance engagement
• Content knowledge development • Video modelling	• Formative assessment • Summative assessment • Surveillance	• Generate excitement • Save time • Impact on activity levels

TPACK – Digital literacy was generally good, effectively blending technology with content and pedagogy is a challenge for some teachers

From the voices of teachers…

“with the dance stuff… we played the video first and then we work from the video”

(Lana, Interview 5)

From the voices of teachers…

“It's been useful videoing and taking photographs … because they don't realise what positions they're in until they see it, their practice is improved significantly as a result. ”

(Kelly, Interview 3)

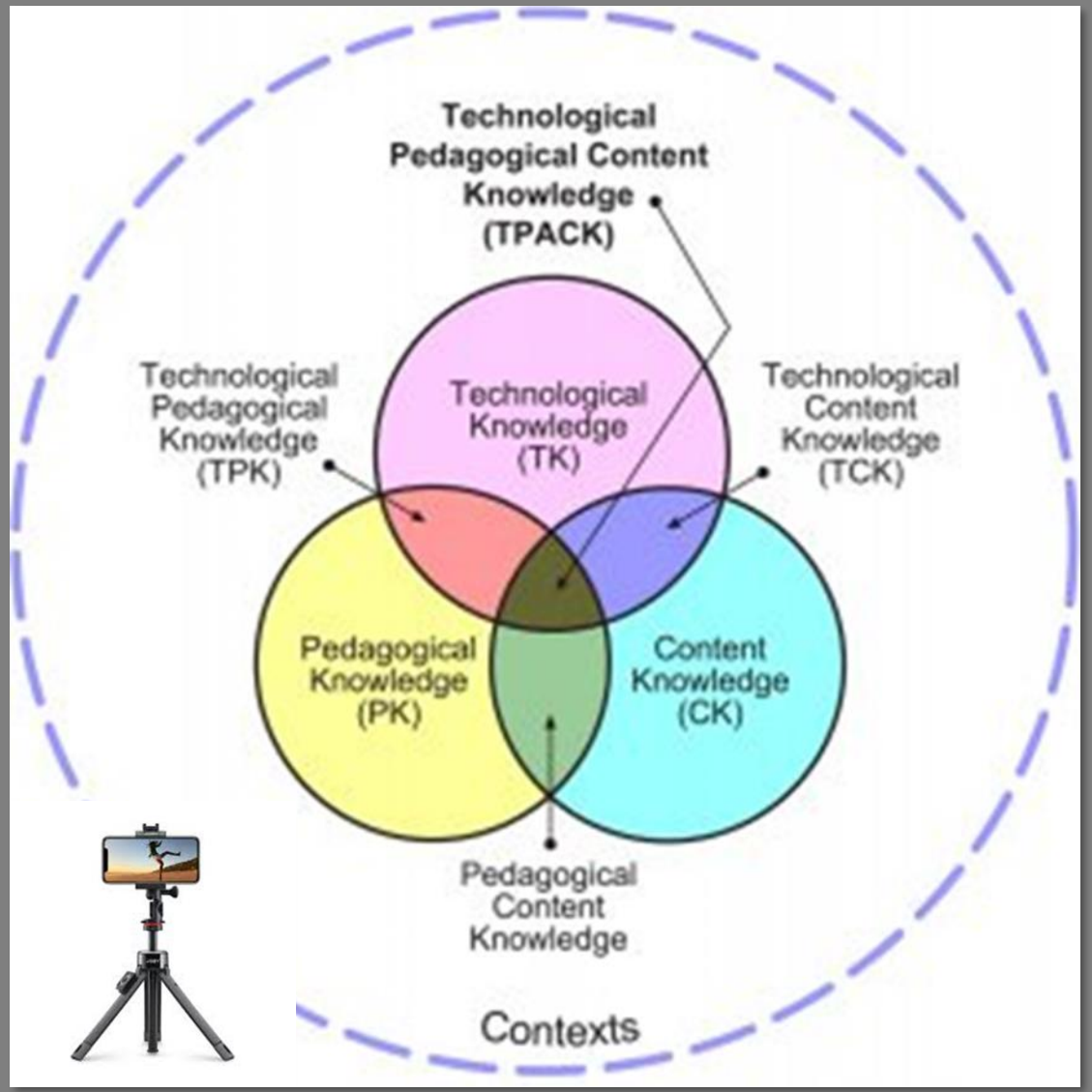
From the voices of teachers…

“You haven't got time to get around to everybody, so if they can do it themselves, and many can, they absolutely love doing it as well.”

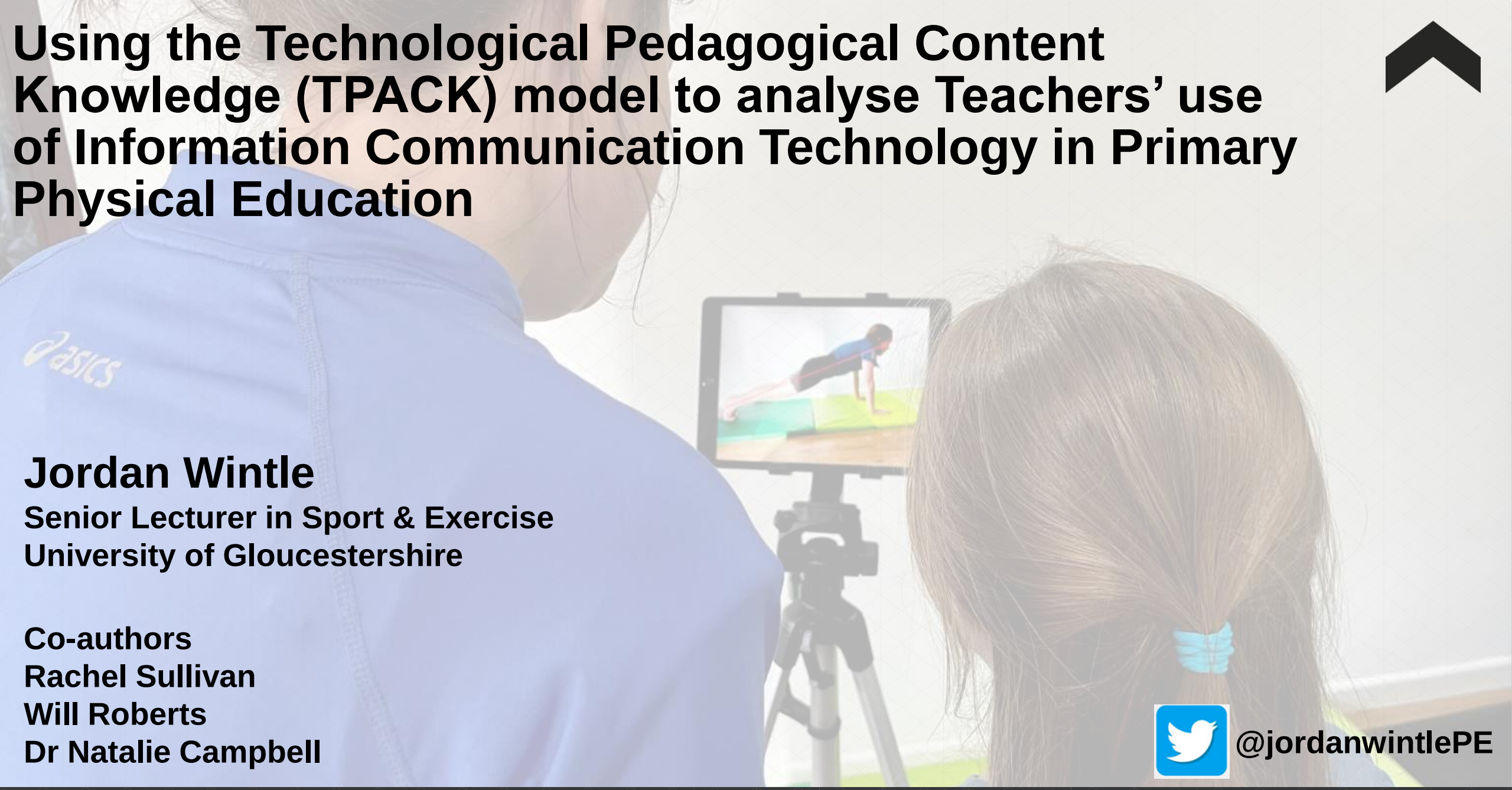
(Dave, Interview 7)

Conclusions

- Issues with some teachers access to and ability to use ICT effectively.
- Some positive links with ICT supporting TPK – assessment
- Question whether ICT should be a “patch” to plug holes in content knowledge.



Using the Technological Pedagogical Content Knowledge (TPACK) model to analyse Teachers' use of Information Communication Technology in Primary Physical Education



Jordan Wintle
Senior Lecturer in Sport & Exercise
University of Gloucestershire

Co-authors
Rachel Sullivan
Will Roberts
Dr Natalie Campbell

@jordanwintlePE

References

Acquaviva J, Beaudet R and Maina M (2013) Technology in physical education: Striking a delicate balance. The Global Journal of Health and P hysical Education Pedagogy 2(3): 197–204.

Carse, N., Jess, M., & Keay, J. (2018). Primary physical education: shifting perspectives to move forwards. European Physical Education Revie w, 24(4), 487–502.

Casey, A., Goodyear, V. A., & Armour, K. M. (2017). Rethinking the relationship between pedagogy, technology and learning in health and physi cal education. Sport, Education and Society, 22(2), 288–304.

Choi, S.-M., Sum, R. K.-W., Wallhead, T., Ha, A. S.-C., Sit, C. H.-P., Shy, D.-Y., & Wei, F.-M. (2021). Preservice physical education teachers' pe rceived physical literacy and teaching efficacy. Journal of Teaching in Physical Education, 40(1), 146–156.

Cope, E., Bailey, R., & Parnel, D. (2015). Outsourcing physical education: a critical discussion. International Journal of Physical Education, 52(4), 2–11. https://doi.org/10.5771/2747-6073-2015-4-2

Department for Education (2018) Using technology to aid school improvement in primary schools. Online from https://www.gov.uk/government/ case-studies/using-technology-to-aid-school-improvement . Retrieved 20.02.2022

Dunn, D. (2017) How to be an Outstanding Primary School Teacher (2nd ed). Bloomsbury.

Fereday, J., & Muir-Cochrane, E. (2006). Demonstrating rigor using thematic analysis: a hybrid approach of inductive and deductive coding and theme development. International Journal of Qualitative Methods, 5(1), 80–92. https://doi.org/10.1177/160940690600500107

References

Gard, M. (2014). eHPE: A history of the future. Sport Education and Society, 219 (6), 827-845.

Griggs, G. (2007). Physical education: primary matters, secondary importance. Education 3-13, 35(1), 59–69.

Higgins, S., Xiao,Z, M. & Katsipataki, M (2012) The Impact of Digital Technology on Learning: A Summary for the Education Endowment Found ation Full Report. Online from https://eric.ed.gov/?id=ED612174

Jess, M., McEvilly, N., & Carse, N. (2017). Moving primary physical education forward: start at the beginning. Education 3-13, 45(5), 645–657.) https://doi.org/10.1080/03004279.2016.1155072

Jones, L., & Green, K. (2017). Who teaches primary physical education? change and transformation through the eyes of subject leaders. Sport, Education and Society, 22(6), 759–771. https://doi.org/10.1080/13573322.2015.1061987

Kuklick, C., & Harvey, S. (2018). Developing physical educators' knowledge of opaque and transparent technologies and its implications for stu dent learning. In J. Koekoek & I. van Hilvoorde (Eds.), Digital technology in physical education: Global perspectives (pp. 147- 163). Routledge. https://doi.org/10.4324/9780203704011

Lewin, C., Smith, A., Morris, S. & Craig, E. (2019). Using Digital Technology to Improve Learning: Evidence Review. London: Education Endow ment Foundation. Accessed March 6, 2021 from https://educationendowmentfoundation.org.uk/evidence-summaries/evidence-reviews

Lichtman, M. (2013). Qualitative research in education: A user's guide (3rd ed.). Sage.

Lupton, D. (2013). Quantifying the body: monitoring and measuring health in the age of mhealth technologies. Critical Public Health, 23(4), 393 –403. https://doi.org/10.1080/09581596.2013.794931

References

Marbán, J. M., & Mulenga, E. M. (2019). Pre-service primary teachers' teaching styles and attitudes towards the use of technology in mathematics classrooms. International Electronic Journal of Mathematics Education, 14(2), 253–263.

Mishra, P., and Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for integrating technology in teachers' knowledge. Teachers College Record, 108 (6), 1017–1054

Morgan, P., & Bourke, S. (2008). Non-specialist teachers' confidence to teach pe: the nature and influence of personal school experiences in pe. Physical Education and Sport Pedagogy, 13(1), 1–29.

Morgan, P. J., & Hansen, V. (2008). Classroom teachers' perceptions of the impact of barriers to teaching physical education on the quality of physical education programs. Research Quarterly for Exercise and Sport, 79(4), 506–16.

O'Loughlin, J., Chróinín, D. N., & O'Grady, D. (2013). Digital video: the impact on children's learning experiences in primary physical education. European Physical Education Review, 19(2), 165–182. https://doi.org/10.1177/1356336X13486050

Picton, I. (2019) Teachers' use of technology to support literacy in 2018. A National Literacy Trust research report. Online from https://files.eric.ed.gov/fulltext/ED598387.pdf

Roberts, W. M., Newcombe, D. J., & Davids, K. (2019). Application of a constraints-led approach to pedagogy in schools: embarking on a journey to nurture physical literacy in primary physical education. Physical Education and Sport Pedagogy, 24(2), 162–175. https://doi.org/10.1080/17408989.2018.1552675

Rosenberg, J. M., & Koehler, M. J. (2015). Context and technological pedagogical content knowledge (tpack): a systematic review. Journal of Research on Technology in Education, 47(3), 186–210.

References

Sloan, S. (2010). The continuing development of primary sector physical education: working together to raise quality of provision. European Physical Education Review, 16(3), 267–281. https://doi.org/10.1177/1356336X10382976

Sargent, J., & Casey, A. (2019). Appreciative inquiry for physical education and sport pedagogy research: a methodological illustration through teachers' uses of digital technology. Sport, Education and Society, 26(1), 45–57.

Sullivan, R. (2019) The use of digital technology in primary physical education, Impact, 3, pp.80-91.
Tsangaridou, N. (2012). Educating primary teachers to teach physical education. European Physical Education Review, 18(3), 275–286. https://doi.org/10.1177/1356336X12450788

Van Rossum, T. & Morley, D. (2018) The role of digital technology in the assessment of children's movement competence during primary school physical education lessons. In Koekoek, J., & Hilvoorde, I. van (Eds.). (2018). Digital technology in physical education: global perspectives (Ser. Routledge studies in physical education and youth sport). Routledge. https://doi.org/10.4324/9780203704011

Wijnen, F. M., Walma van der Molen, J. H., & Voogt, J. (2021). Primary school teachers' attitudes toward technology use and stimulating higher-order thinking in students: a review of the literature. Journal of Research on Technology in Education, (2021).

Wintle, J. (2019) Digital Technology in Physical Education: Global Perspectives. Sport, Education and Society, 24(6), pp. 665–667. https://doi.org/10.1080/13573322.2019.1618103