Emergency Remote Teaching and Digital Technology Usage in K-12 Teacher Practice
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Background, Problem and Context

This research explored the impact of emergency remote teaching (ERT) during COVID-19 that occurred between March 2020 and September 2022 on digital technology usage in K-12 teacher practice.

Emergency Remote Teaching (ERT)

We know COVID-19 impacted 1.6 billion learners in over 190 countries and resulted in the largest disruption of education in modern history. Education across all levels either halted learning or transitioned to ERT abruptly in Spring 2020. While many schools reopened in September 2020, subsequent waves forced jurisdictions into additional ERT scenarios.

Digital Technology

K-12 Education

With this, digital technologies are potentially being used more in K-12 classrooms. However, information as to how ERT during COVID-19 has impacted digital technology integration in K-12 teacher practice is limited.

Research Questions

How has ERT during COVID-19 impacted the use of digital technologies in K-12 teacher current practice?

- What digital technologies were part of teacher practice prior to ERT?
- What digital technologies introduced for ERT have remained in teacher practice? Why?
- What digital technologies introduced for ERT were eliminated from teacher practice? Why?
- What are teacher perceptions on how experiencing ERT has changed their current practice?

Case Study Methodology

The case study is "an in-depth description and analysis of a bounded system" (Merriam & Tisdell, 2016, p. 37). This methodology was chosen as the research questions were designed to conduct a descriptive inquiry (Merriam & Tisdell, 2016).

The unit of analysis was K-12 teachers who experienced a minimum of one cycle of ERT between March 2020 and September 2022.

A cycle was defined as transitioning from in-person to ERT and then back to in-person learning.
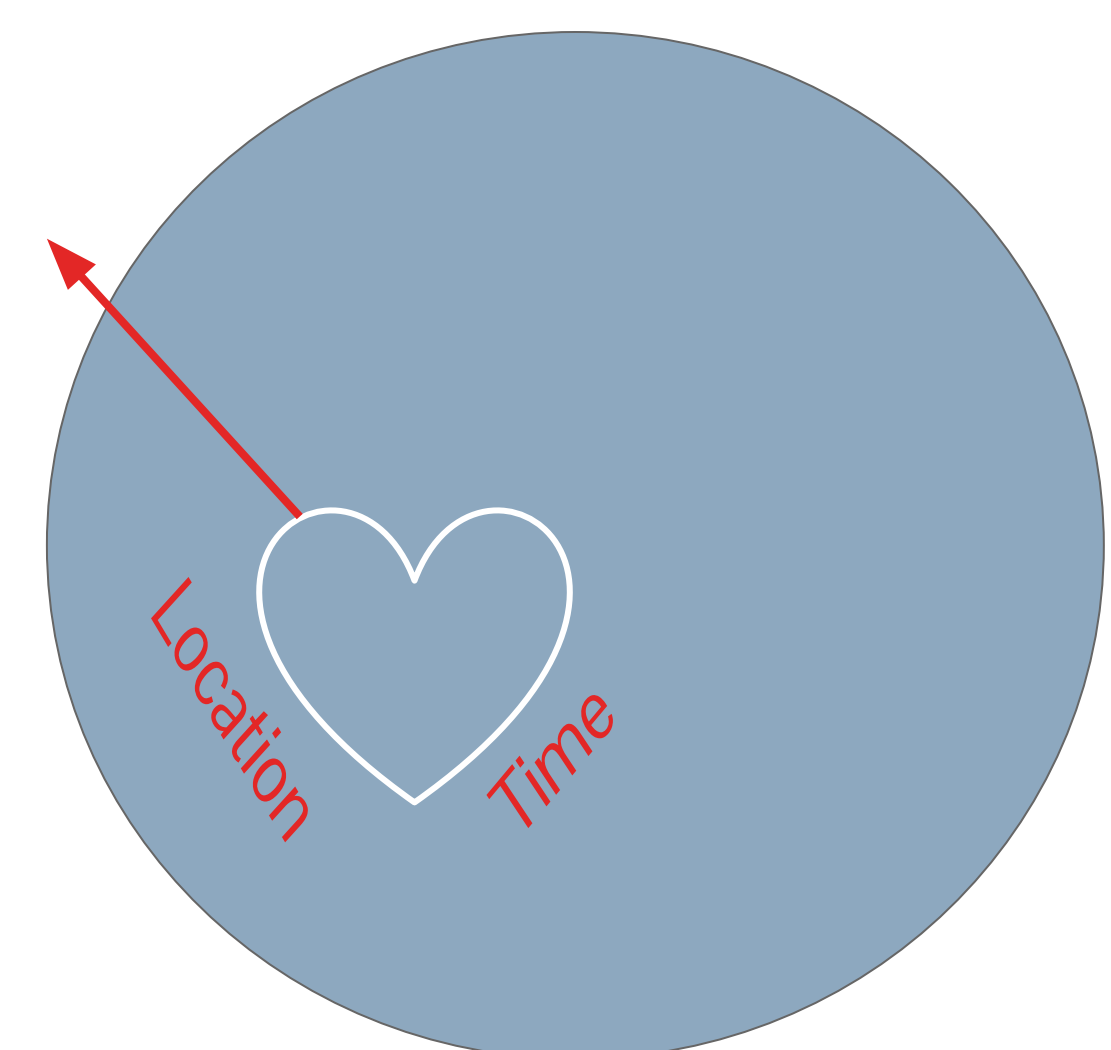
Location / Time

The case was bound by time and location:
- data collection to a window of four months.
- Study was bound to one large university due to access, diversity, range of teachers in different schools and grades.

Sample

- ✓ K-12 teacher
- ✓ Minimum 2 years teaching experience
- ✓ Minimum one ERT experience between March 2020 - September 2022
- ✓ Graduate student at selected university
- ✓ Enrolled in Fall 2022 coursework
- ✓ Voluntary

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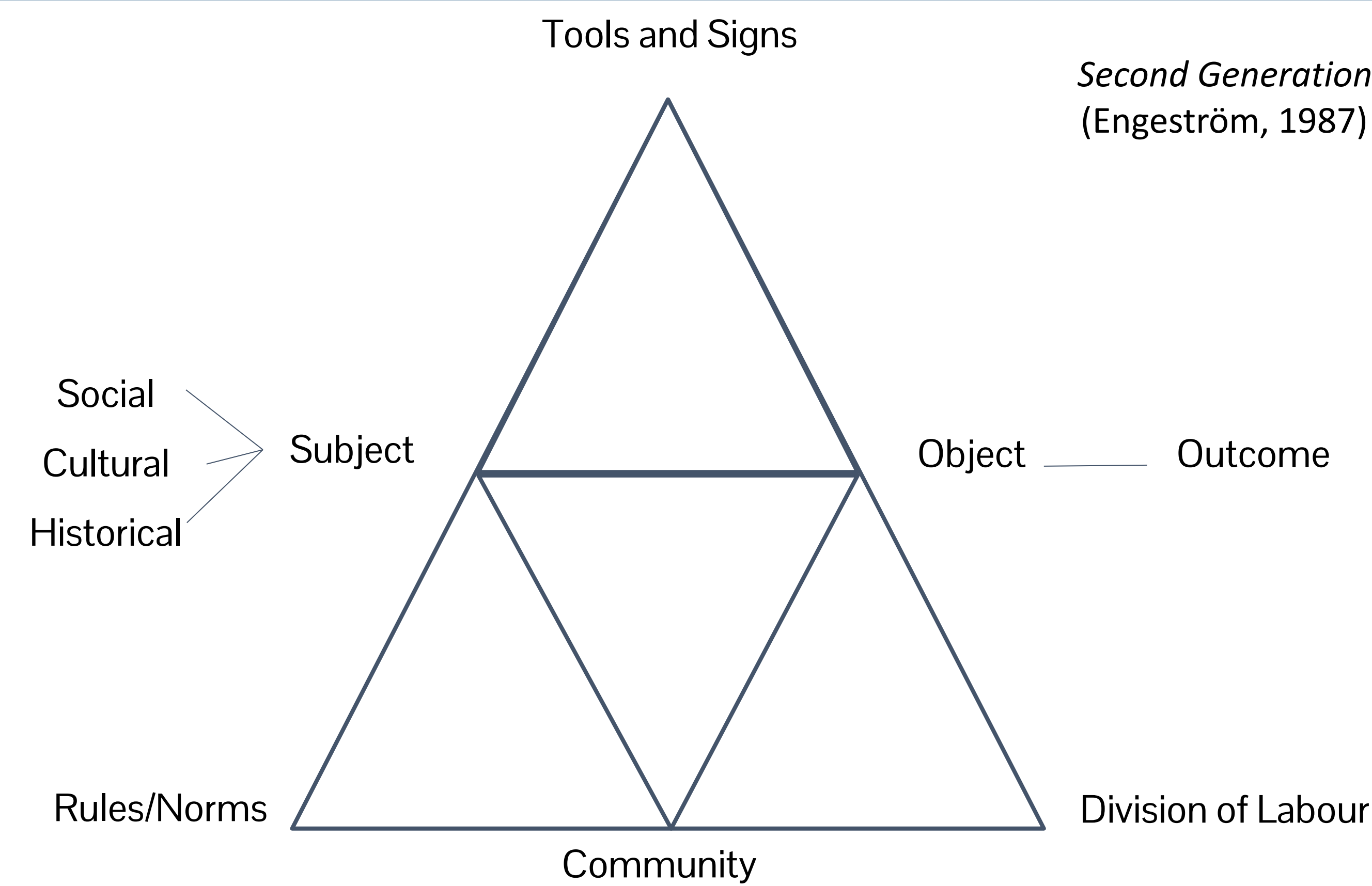Fullan, M. (2016). *The NEW Meaning of Educational Change (5th ed)*. Teachers College Press.
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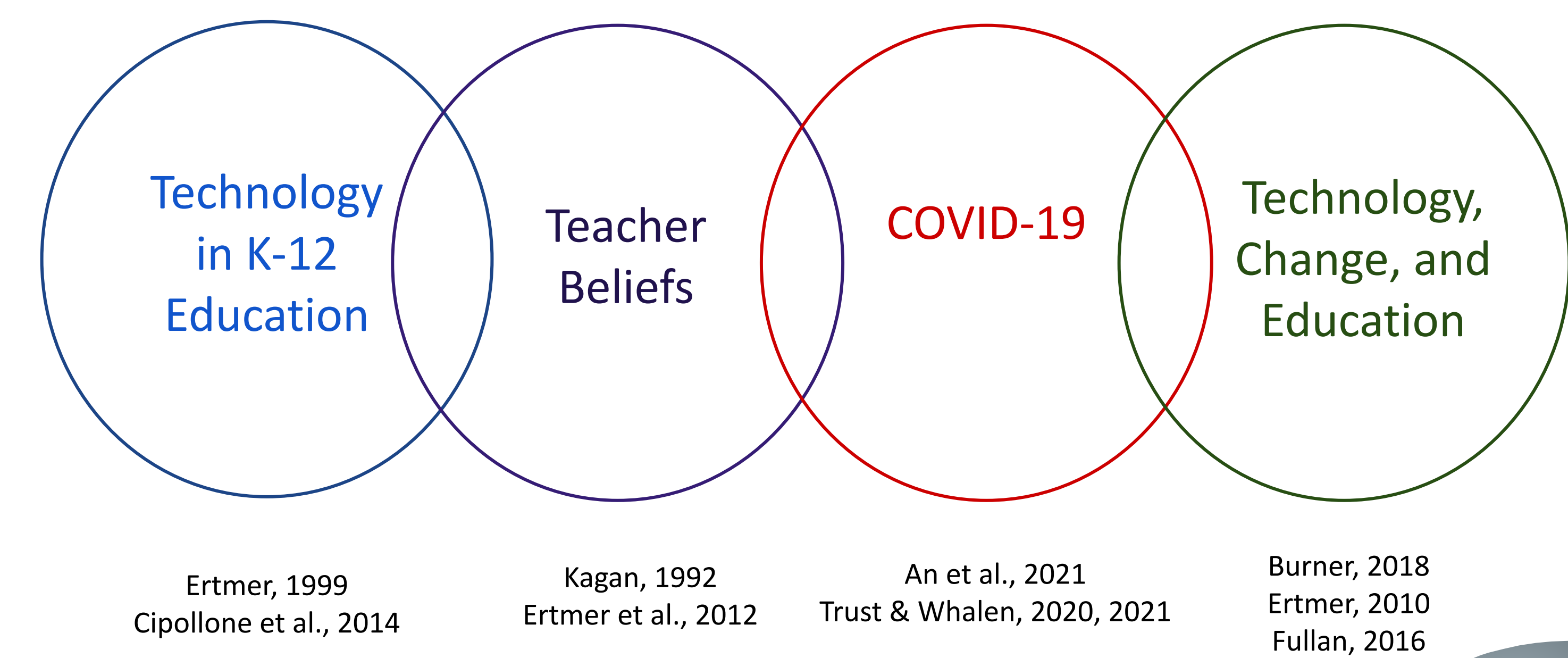Saldaña, J. (2016). *The coding manual for qualitative researchers* (3rd ed.). Sage.
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Theoretical Framework: Cultural Historical Activity Theory

Second Generation (Engeström, 1987)

Tools and Signs

Social Cultural Historical — Subject

Object — Outcome

Rules/Norms

Community

Division of Labour

Conceptual Framework

Technology in K-12 Education — Teacher Beliefs — COVID-19 — Technology, Change, and Education

Ertmer, 1999
Cipollone et al., 2014

Kagan, 1992
Ertmer et al., 2012

An et al., 2021
Trust & Whalen, 2020, 2021

Burner, 2018
Ertmer, 2010
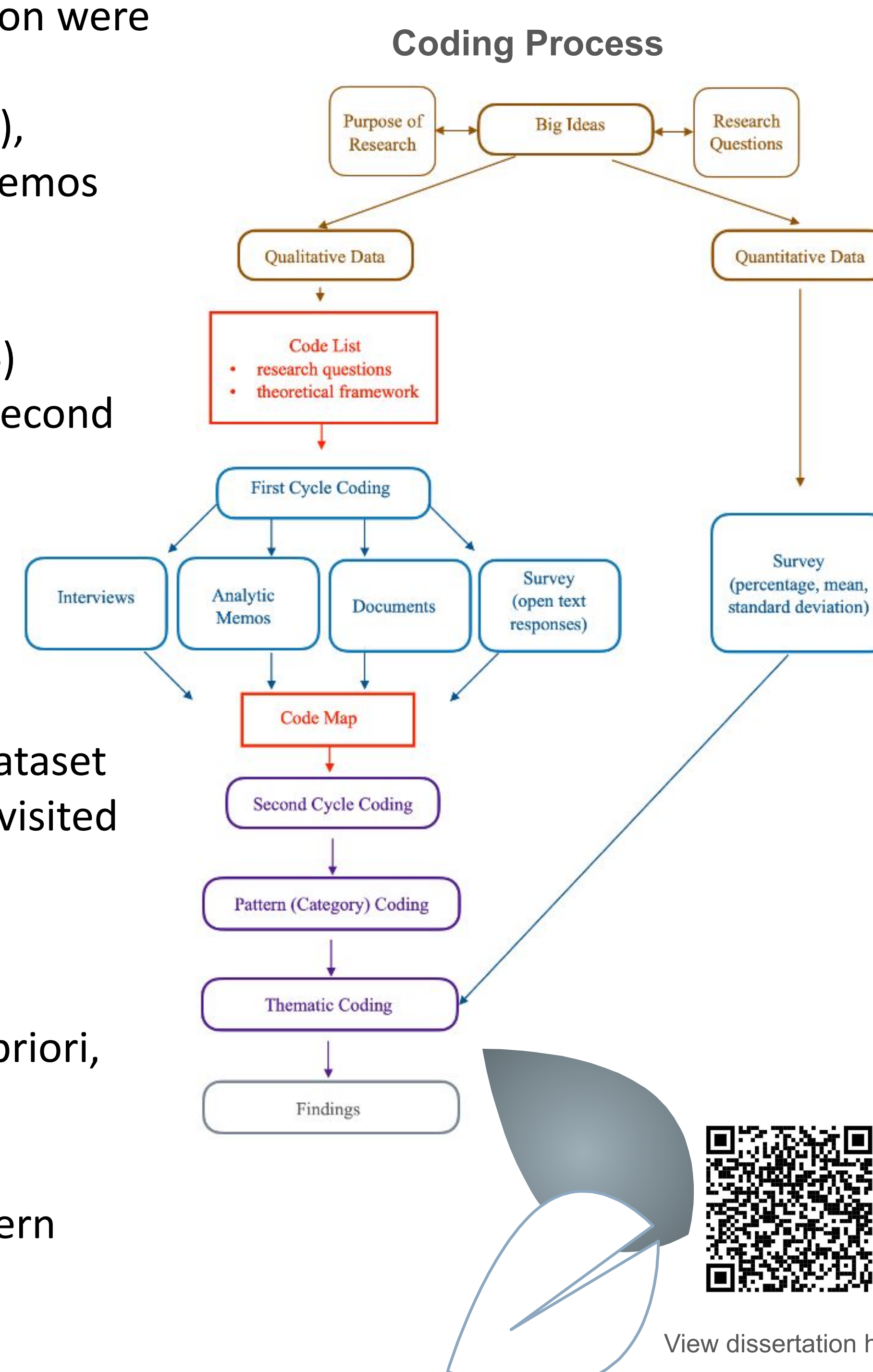Fullan, 2016

Methods and Data Analysis

Four methods of data collection were used: online survey (24), semi-structured interviews (9), document Review, analytic memos (10).

Analysis used Saldaña's (2016) framework of first cycle and second cycle coding.

Quantitative data from the online survey were analysed during first cycle by reporting descriptive statistics for my dataset (Fraenkel et al., 2012), and revisited throughout data processing.
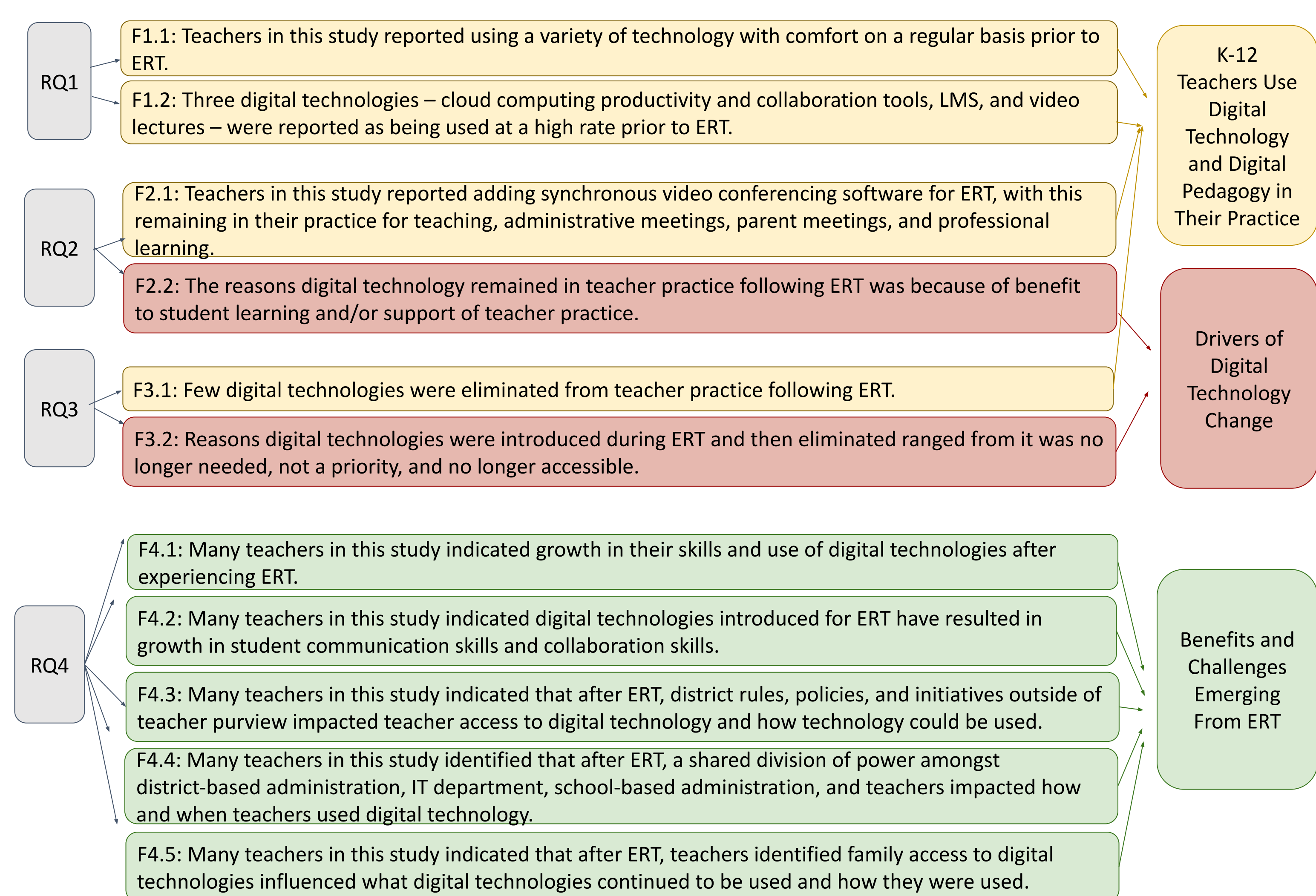
Coding of qualitative data in first-cycle coding included a priori, attribute, and In Vivo coding.

Second cycle coding was pattern coding, and resulted in seven categories and four themes.

Coding Process

Purpose of Research — Big Ideas — Research Questions

Qualitative Data — Quantitative Data

Code List
- research questions
- theoretical framework

First Cycle Coding

Interviews | Analytic Memos | Documents | Survey (open text responses) | Survey (percentage, mean, standard deviation)

Code Map

Second Cycle Coding

Pattern (Category) Coding

Thematic Coding

Findings

View dissertation here.

Presentation of Findings

Findings were presented by first providing a detailed description of the case. Survey participants were described by attribute. Next, the backgrounds of interview participants - with a focus on digital technology usage at the time of their interview - was provided. Last, findings were presented by research question. Four secondary research questions presented 11 findings. An analytic table was used to draw three themes from findings.

RQ1
- F1.1: Teachers in this study reported using a variety of technology with comfort on a regular basis prior to ERT.
- F1.2: Three digital technologies – cloud computing productivity and collaboration tools, LMS, and video lectures – were reported as being used at a high rate prior to ERT.

→ K-12 Teachers Use Digital Technology and Digital Pedagogy in Their Practice

RQ2
- F2.1: Teachers in this study reported adding synchronous video conferencing software for ERT, with this remaining in their practice for teaching, administrative meetings, parent meetings, and professional learning.
- F2.2: The reasons digital technology remained in teacher practice following ERT was because of benefit to student learning and/or support of teacher practice.

RQ3
- F3.1: Few digital technologies were eliminated from teacher practice following ERT.
- F3.2: Reasons digital technologies were introduced during ERT and then eliminated ranged from it was no longer needed, not a priority, and no longer accessible.

→ Drivers of Digital Technology Change

RQ4
- F4.1: Many teachers in this study indicated growth in their skills and use of digital technologies after experiencing ERT.
- F4.2: Many teachers in this study indicated digital technologies introduced for ERT have resulted in growth in student communication skills and collaboration skills.
- F4.3: Many teachers in this study indicated that after ERT, district rules, policies, and initiatives outside of teacher purview impacted teacher access to digital technology and how technology could be used.
- F4.4: Many teachers in this study identified that after ERT, a shared division of power amongst district-based administration, IT department, school-based administration, and teachers impacted how and when teachers used digital technology.
- F4.5: Many teachers in this study indicated that after ERT, teachers identified family access to digital technologies influenced what digital technologies continued to be used and how they used them.

→ Benefits and Challenges Emerging From ERT

Conclusions

- A more clear articulation of the terms digital technology and digital pedagogy is needed as variations in how teachers define and apply it exist.
- The use of cloud-based technology has become common in K-12 education.
- Most digital technologies introduced during ERT have remained in teachers' practice after the return to in-person teaching.
- Teachers' are more likely to continue using digital technology if they perceive the technology to be valuable, useful, and relevant to achieving their desired activity system outcomes.
- An interconnectedness exists between teacher perceptions of individual technology skills, teaching approaches, and teacher beliefs and attitudes towards technology integration exists.
- The way students and teachers communicate are shifting.
- The level of physical access to digital technology teachers desire contradicts the physical access the district-based administration provides.
- Teachers have a greater understanding of the home access their students have to technology as a result of experiencing ERT.

Significance

Theory

Research adds to existing theory surrounding technology integration in teacher practice. Using CHAT as a framework, it explored factors that supported change, with a focus on what teachers perceived as important to accepting change. Findings from this study emphasize the intrinsic drivers of change, which are often overshadowed by external measures such as time and training.

Methodology

Research design provides a framework for using CHAT in combination with a case study. This enabled the researcher to explore technology usage in-depth after a historical event disrupted the teacher activity system. Using the case archive, it is anticipated future research exploring activity systems can use this study to guide methodological decision-making.

Practice

Study findings identify the impact of ERT on digital technology use in K-12 teacher practice.

Of significance:
- the level of technology use amongst study participants
- specific technologies that have potentially become common in teacher practice.
- ways in which technology is being used to support teacher practice and facilitate classroom routines.
- new benefits and challenges connected to technology use