TEACHER PROFESSIONAL RESILIENCE IN THE CONTEXT OF DIGITALIZATION: STAKEHOLDER PERSPECTIVES ON RISKS, PROTECTIVE RESOURCES, AND CONTEXTUAL FACTORS

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ABSTRACT

TEACHER PROFESSIONAL RESILIENCE IN THE CONTEXT OF DIGITALIZATION: STAKEHOLDER PERSPECTIVES ON RISKS, PROTECTIVE RESOURCES, AND CONTEXTUAL FACTORS

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This study aimed to describe teachers', school administrators', and academicians' perspectives on risks, protective resources and strategies, and contextual factors associated with teacher professional resilience in the context of digitalization, and to examine shared and divergent emphases across groups. A qualitative descriptive survey design was used. Open-ended responses were obtained from 54 participants—19 teachers, 17 school administrators, and 18 academicians—recruited through convenience sampling. Each stakeholder group completed an online form containing seven open-ended questions, and the responses were analyzed using qualitative content analysis. The final coding system comprised 35 leaf codes and 426 coded segments. The most visible risk pattern was technostress, digital competence gaps, and adaptation difficulties; the most visible protective pattern was professional development and self-directed digital learning; and the most visible contextual pattern was adequate and facilitating technological infrastructure. Teachers foregrounded classroom-level usability, workload, and student–parent interactions; administrators emphasized organizational capacity, infrastructure, and support processes; and academicians emphasized conceptual, ethical, professional-development, and policy issues. Cross-group frequencies and percentages were used only to describe pattern visibility. The integrative interpretation indicates that, depending on conditions, the same digital phenomenon may function as a demand, a resource, or a contextual condition. Open-ended written responses collected at a single time point do not directly demonstrate how resilience develops over time or establish causal effects.

Keywords: Teacher Professional Resilience, Digitalization, Technostress, Protective Resources, Contextual Factors

ÖZ

DİJİTALLEŞME BAĞLAMINDA ÖĞRETMENLERİN MESLEKİ DAYANIKLILIĞI: RİSKLER, KORUYUCU KAYNAKLAR VE BAĞLAMSAL FAKTÖRLERE İLİŞKİN PAYDAŞ GÖRÜŞLERİ

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Bu çalışma, dijitalleşme bağlamında öğretmenlerin mesleki dayanıklılığıyla ilişkili riskler, koruyucu kaynak ve stratejiler ile bağlamsal faktörlere ilişkin öğretmen, okul yöneticisi ve akademisyen görüşlerini betimlemeyi; gruplar arasındaki ortak ve farklılaşan vurguları incelemeyi amaçlamıştır. Nitel betimsel tarama deseninde, kolayda örnekleme yoluyla ulaşılan 19 öğretmen, 17 okul yöneticisi ve 18 akademisyen olmak üzere 54 katılımcının, her grup için yedi açık uçlu soru içeren çevrimiçi formlara verdiği yanıtlar nitel içerik analiziyle çözümlenmiştir. Nihai kodlama sistemi 35 alt kod ve 426 kodlanmış bölümden oluşmuştur. En görünür risk örüntüsü teknostres, dijital yeterlik eksiklikleri ve uyum güçlükleri; en görünür koruyucu örüntü mesleki gelişim ve öz-yönelimli dijital öğrenme; en görünür bağlamsal örüntü ise yeterli ve kolaylaştırıcı teknolojik altyapıdır. Öğretmenler sınıf düzeyindeki kullanılabilirlik, iş yükü ve öğrenci-veli etkileşimlerini; yöneticiler örgütsel kapasite, altyapı ve destek süreçlerini; akademisyenler kavramsal, etik, mesleki gelişim ve politika konularını daha görünür kılmıştır. Gruplar arası frekans ve yüzde değerleri yalnızca betimsel görünürlüğü desteklemektedir. Bütünleştirici yorum, aynı dijital olgunun koşullara göre talep, kaynak veya bağlamsal koşul olarak işlev görebildiğine işaret etmektedir. Tek bir zamanda toplanan açık uçlu yazılı yanıtlar, dayanıklılığın zaman içindeki gelişimini ya da nedensel etkileri doğrudan göstermemektedir.

Anahtar Kelimeler: Öğretmenlerin Mesleki Dayanıklılığı, Dijitalleşme, Teknostres, Koruyucu Kaynaklar, Bağlamsal Faktörler

To my daughters Ülkü and İlke.

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LIST OF ABBREVIATIONS

AC	Academician; prefix used in anonymized participant IDs
AI	Artificial Intelligence
COR	Conservation of Resources Theory
COVID-19	Coronavirus Disease 2019
ICT	Information and Communication Technologies
ID	Identifier
IT	Information Technology
JD-R	Job Demands-Resources Model
METU	Middle East Technical University
OECD	Organisation for Economic Co-operation and Development
RQ	Research Question
SA	School administrator; participant ID prefix
SD	Standard Deviation
T	Teacher; prefix used in anonymized participant IDs
UNESCO	United Nations Educational, Scientific and Cultural Organization

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Technological developments have brought about a comprehensive process of digital transformation in education systems. Online learning environments, artificial intelligence applications, blended learning models, learning management systems, and digital assessment tools are among the main manifestations of this transformation in education. These technologies can reduce temporal and spatial constraints, broaden access to education, and enable greater diversification of teaching and learning processes (Organisation for Economic Co-operation and Development [OECD], 2023; C. Wang et al., 2024). Digital transformation in education is therefore not limited to the increased use of technological tools; it is a broad process of change that also reshapes learning environments, pedagogical practices, and educational roles. This transformation affects not only students' learning experiences but also teachers' roles, competencies, and instructional practices.

Digital transformation requires teachers to assume responsibilities that extend beyond keeping up with technological developments. The Information and Communication Technologies (ICT) Competency Framework for Teachers published by the United Nations Educational, Scientific and Cultural Organization (UNESCO) indicates that teachers need competencies that connect technology use with pedagogical practice, professional learning, and school-level transformation (UNESCO, 2018). Accordingly, teachers are expected to evaluate the pedagogical value of technologies, consider their possible limitations, and integrate them into instructional processes in purposeful ways. These expectations position teachers as active agents who design, implement, and facilitate digital learning environments. From this perspective, developing digital competence has become an important component of teacher education and continuing professional development (Howard et al., 2021).

Although digital transformation offers various opportunities to support instructional processes, it also introduces new professional demands and risks for teachers. The need to continuously learn and update digital competencies (Masoumi & Noroozi, 2025), as well as work-family conflict and strain associated with intensive technology use (Z. Wang et al., 2023), are among the professional demands teachers may face in this process. Technostress (Yang et al., 2025), data security and digital ethics issues (Zhu et al., 2025), and uncertainty regarding the reliability of information generated by artificial intelligence (Lelescu et al., 2025) are also important risks associated with digital transformation. These demands and risks may affect teachers' professional practices as well as their stress levels, productivity, and well-being (Dahabiyeh et al., 2022; Yang et al., 2025).

Teachers' ability to sustain their professional functioning in the face of changing demands is closely related to teacher well-being and professional resilience. Teacher well-being refers to teachers' psychological, emotional, and social experiences in their professional lives (Hascher & Waber, 2021). Professional resilience, by contrast, refers not to a fixed personal trait but to a dynamic process through which teachers adapt to difficulties and sustain their professional functioning (Beltman et al., 2011; Hascher et al., 2021). Higher levels of resilience have been associated with greater well-being and lower levels of stress and burnout, while the development of resilience has been linked to interactions between individual resources and professional and contextual conditions (Ainsworth & Oldfield, 2019; Beltman et al., 2011; Hascher et al., 2021).

The effects of digital professional demands may vary according to the personal and contextual resources available to individuals. Demands created by technology use can lead to stress and anxiety and can intensify experiences of technostress (Estrada-Muñoz et al., 2020; Fernández-Batanero et al., 2021). Technostress has also been associated with adverse health and occupational outcomes (Borle et al., 2021). The Job Demands-Resources (JD-R) Model is a framework that conceptualizes working conditions as job demands that require sustained effort and job resources that support goal attainment, reduce the costs of demands, or facilitate development (Bakker & Demerouti, 2017). According to the

model, the consequences of occupational demands may vary depending on the personal and organizational resources available to employees. In this context, digital self-efficacy may function as a personal resource (Stang-Rabrig et al., 2022), whereas support from school administration and professional development opportunities may function as contextual resources (Califf & Brooks, 2020; Z. Wang et al., 2023). Teachers' ability to draw on such resources when facing digital risks and to sustain their professional functioning indicates that professional resilience is shaped not only by individual characteristics but also by contextual conditions.

The literature examining teachers' experiences of digital transformation has developed along several lines. Some studies focus on occupational risks associated with digitalization, such as technostress, workload, stress, and burnout (Agyapong et al., 2022; L. Li et al., 2024). Other studies address individual competencies, socio-emotional capacities, and coping strategies that may support teachers in managing professional difficulties (Ainsworth & Oldfield, 2019; Nwoko et al., 2023). Contextual resources such as organizational support, school climate, and administrative practices have also received increasing attention in research on teacher resilience. Although the development of research on teacher professional resilience has been examined through systematic and bibliometric studies, these studies have generally concentrated on broader professional difficulties and resilience factors (Kangas-Dick & O'Shaughnessy, 2020; X. Li & Chen, 2026; Lu et al., 2024).

Although studies have addressed the relationship between digital technologies and teacher professional resilience, the available evidence remains fragmented (Adomako Gyasi & Sun, 2026; Yu et al., 2022). Some studies examine specific variables such as technostress and cognitive emotion regulation, whereas others focus on digital self-efficacy or organizational support (Solís et al., 2023; Zivi et al., 2025). Systematic reviews focusing on technostress identify its sources, consequences, and possible mitigation practices. However, these reviews do not always situate the range of digital risks experienced by teachers within a broader professional resilience perspective (Yang et al., 2025).

In addition, the boundaries among well-being, coping, and professional resilience have not always been clearly established in the literature (Hascher et al., 2021; Sun et al., 2022). There is therefore a need to examine, within a common framework, the risks teachers encounter during digital transformation, the strategies they use to cope with those risks, and the personal and contextual resources that support professional resilience.

1.2 Statement of the Problem

Digitalization has generated important changes in education, while the coronavirus disease 2019 (COVID-19) pandemic accelerated the use of digital technologies in educational settings (Haleem et al., 2022). Digital tools can support access, communication, assessment, content production, and instructional flexibility. At the same time, effective use of these tools requires teachers to update their competencies and adapt to changing technological and pedagogical expectations (L. Zhang et al., 2026). These expanding expectations may create new demands alongside the opportunities offered by digital technologies. Evidence from school and university teaching contexts suggests that issues such as technostress, digital workload, work-life strain, uncertainty regarding AI-generated information, cybersecurity concerns, and ethical responsibilities can affect professional functioning (Buda & Kovács, 2024; Z. Wang et al., 2023; Yang et al., 2025; Zhu et al., 2025).

One problem is that these issues are often examined within separate research traditions. Technology-adoption frameworks such as the Technology Acceptance Model and the Unified Theory of Acceptance and Use of Technology explain individuals' acceptance of technology and intentions to use it. They do so by focusing on perceptions of technology and the conditions under which it is used (Galimova et al., 2024; Kittinger & Law, 2024; Xue et al., 2024, 2026). By contrast, another line of research addresses adverse outcomes such as technostress, burnout, and job satisfaction (Aktan & Toraman, 2022; Fernández-Arias et al., 2024). Although these approaches provide important information about specific

relationships, evidence concerning how multiple risks come together in teachers' professional lives can remain fragmented (Sandoval-Obando et al., 2026).

Research on digital risks illustrates this fragmentation. Some studies focus on specific relationships among variables such as technostress, burnout, and job satisfaction (Tu et al., 2025). However, technological, individual, and organizational conditions may jointly shape technostress. Duration of technology use, self-efficacy, and colleague support may also be related to this experience (Cazan et al., 2024; Wu et al., 2026). Focusing on a single risk or outcome may therefore fail to explain fully how risks accumulate, reinforce one another, or become more manageable under supportive conditions. Protective resources have also been studied, but they are often examined separately from the risks they may buffer.

In addition, digital competence has been associated with lower technostress and higher professional well-being, suggesting a possible protective function (Jurić et al., 2026). Colleague and leadership support have been presented as job resources that may reduce burnout, while personal resources and motivation to teach have also been identified as potentially protective against adverse professional outcomes (De Stasio et al., 2024; Jovanović et al., 2025). These findings indicate that resilience cannot be fully understood simply by identifying risks. It is also necessary to understand the resources and strategies through which teachers respond to those risks.

The effectiveness and accessibility of these resources may depend on the contexts in which teachers work. Teachers working in different school types, educational levels, geographic regions, or technological environments may encounter different opportunities and constraints. Differences between urban and rural settings have been reported in access, technological pedagogical knowledge, attitudes toward technology, device availability, infrastructure reliability, and alignment with the curriculum (*M*. Li, 2025; Sepadi et al., 2025). School climate, leadership, staffing structures, career stage, and policy arrangements may also shape how the same digital demand is experienced by different teachers (Ainsworth & Oldfield, 2019; Cann et al., 2022).

Taken together, the research gap does not arise because these issues have never been examined individually. Rather, risks associated with digitalization, the protective resources and strategies that may be used in response, and the contextual conditions that shape how they operate are often addressed in separate lines of research. The accumulation of digital risks, the function of resources in relation to particular demands, and the ways contextual conditions alter both exposure to risks and access to resources are not always examined together within a common professional resilience framework. In addition, limited attention has been paid to the convergences and divergences that may emerge when teachers' classroom and everyday professional experiences, school administrators' assessments of organizational conditions, and academicians' conceptual and system-level perspectives are compared within the same analytical structure. This study therefore addresses the gap by describing digitalization-related risk, resource/strategy, and context patterns jointly and relationally from different stakeholder positions.

1.3 Purpose of the Study

The purpose of this study is to describe teachers', school administrators', and academicians' perspectives on risks, protective resources and strategies, and contextual factors associated with teacher professional resilience in the context of digitalization. It also examines the shared and divergent emphases of the three stakeholder groups within the same analytical framework. The study does not aim to measure or directly track the dynamic process of adaptation through which professional resilience develops over time. Instead, it seeks to identify the factors stakeholders associate with this process and the patterns in their perspectives on those factors.

To this end, the study brings together teachers' perspectives grounded in classroom and everyday professional experiences, school administrators' perspectives grounded in organizational conditions and support processes, and academicians' perspectives grounded in conceptual, research-based, and system-level evaluations. Examining these professional positions together makes it

possible to describe risks, protective resources and strategies, and contextual factors not merely as separate lists but as analytically related domains within the context of digitalization.

1.4 Research Questions

In line with this purpose, the study addresses the following research questions:

1. How do teachers, school administrators, and academicians describe the risks associated with teacher professional resilience in the context of digitalization?
2. How do teachers, school administrators, and academicians describe the individual, social, and institutional protective resources and strategies associated with teacher professional resilience in the context of digitalization?
3. How do teachers, school administrators, and academicians describe the contextual factors associated with teacher professional resilience in the context of digitalization, particularly institutional and technological conditions?

1.5 Significance of the Study

The conceptual contribution of this study lies in examining risks, protective resources and strategies, and contextual conditions associated with teacher professional resilience in the context of digitalization as related domains rather than as independent lists. These domains can serve different functions within the same professional work environment. Rather than positioning digitalization as a uniformly positive or negative influence on teachers, the framework examines how the same digital phenomenon may be perceived, depending on conditions, as an additional demand, an accessible resource, or a contextual condition that shapes these functions. The study therefore does not seek to demonstrate directly the dynamic process of professional resilience over time. Its contribution is to provide an integrative account of how factors associated with that process are understood together through stakeholder perspectives in the context of digitalization.

A second contribution extends beyond bringing three stakeholder groups into the same investigation. The study compares which aspects of the same professional field are foregrounded from different professional positions. Teachers' perspectives may foreground classroom-level feasibility and everyday professional

experience; school administrators' perspectives may foreground organizational capacity, infrastructure, and support processes; and academicians' perspectives may foreground ethical, policy, professional-development, and conceptual issues. These perspectives are treated not as equivalent evidence of the same experience but as different, complementary viewpoints. The distinctive value of the study therefore lies not only in the frequency ordering of codes but also in a stakeholder-based integrative framework that shows how shared and divergent patterns are distributed across classroom, organizational, and system/conceptual levels.

From a practical perspective, the findings may help identify areas in which teachers need support beyond individual digital competence alone. Professional development, colleague and technical support, clear workload boundaries, supportive leadership, reliable infrastructure, and appropriate digital resources may influence whether digitalization functions primarily as a demand or as a resource. Identifying these conditions may inform school-level support practices and continuing professional development.

At the policy level, the study may provide evidence concerning the importance of aligning digital transformation initiatives with teachers' actual working conditions. Policies that increase digital requirements without providing adequate infrastructure, technical support, professional learning, or time may create additional demands. By contrast, policies that account for differences across school type, educational level, subject area, career stage, and local conditions may support more sustainable digital transformation.

1.6 Definition of Terms

In this study, teacher professional resilience refers to the process through which teachers adapt to professional difficulties and changing job demands, draw on available personal, social, and contextual resources, and sustain their professional functioning. The concept is treated not as a fixed personality trait but as a dynamic process shaped through interaction between the individual and the work environment (Beltman et al., 2011; Hascher et al., 2021). Empirically, the concept is used in this thesis not to measure directly how this process develops over

time, but to describe stakeholder perspectives on the risks, protective resources and strategies, and contextual conditions associated with it.

In this study, digitalization refers to a broad work context that encompasses not only the use of digital tools but also changes introduced by digital technologies, platforms, data systems, and artificial intelligence applications in teaching, communication, assessment, professional learning, workflows, and school organization (OECD, 2023; C. Wang et al., 2024). Accordingly, digitalization is used in this thesis as the contextual framework within which the demands teachers face, the resources available to them, and the organizational conditions in which they work are considered together.

In this study, stakeholder perspectives refer to how phenomena associated with teacher professional resilience are described from three different professional positions. Teacher perspectives foreground classroom and everyday professional experience; school administrator perspectives foreground organizational conditions and support processes; and academician perspectives foreground conceptual, research-based, ethical, policy, and professional-development considerations. These perspectives are treated neither as equivalent evidence of the same experience nor as data sources that validate one another. Instead, they are interpreted as complementary stakeholder viewpoints on the phenomenon at different levels.

In this study, digital risks refer to digitalization-related demands and threats that, in participant accounts, may make it more difficult for teachers to sustain their professional functioning or may create additional adaptation demands. Technostress, digital competence and adaptation difficulties, digital workload, continuous accessibility, technical disruptions, ethical and cybersecurity concerns, digital content problems, student misuse of digital technologies/AI, and concerns about professional role or autonomy are considered under this analytical function.

In this study, protective resources and strategies refer to personal, social, professional, digital, and institutional capacities, supports, and actions that may help teachers cope with professional demands and sustain professional functioning. The term resource emphasizes an available capacity or supportive condition,

whereas strategy emphasizes an action or practice used by the teacher or institution in response to demands. Professional development, colleague and technical support, personal motivation and well-being resources, appropriate digital instructional resources, supportive leadership, stable policies, workload arrangements, and selective/bounded digital use are considered within this scope.

In this study, contextual factors refer to conditions in the work environment that may shape which risks teachers encounter, how those risks are experienced, and the extent to which protective resources are accessible. School climate and leadership, technological infrastructure and technical support, policy and local-context alignment, school type and educational level, subject area and professional position, geographic and socioeconomic conditions, student and parent characteristics, and crisis/emergency conditions are considered within this scope. The labels risk, protective resource/strategy, and contextual factor are used not as mutually exclusive fixed types of entities but according to the analytical function a phenomenon serves within a participant account; the same phenomenon may therefore serve different functions under different conditions.

1.7 Scope and Limitations

The empirical scope of this study is limited to the open-ended qualitative responses of 54 participants: 19 teachers, 17 school administrators, and 18 academicians. The teacher and administrator samples were drawn from the Ankara context, whereas the academician sample included participants from different cities. Participants were recruited through convenience sampling via professional and academic networks accessible to the researcher and referrals from individuals within those networks. The sample was therefore not intended to statistically represent a broader population. Frequency information was likewise used not to make population-level inferences but to describe the distribution of coded ideas within the sample.

The study's reliance on online open-ended forms also introduces several limitations. Participants were able to respond in their own time and in their own words; however, the researcher could not ask immediate follow-up questions of the

kind possible in interviews. As a result, responses varied in length and level of detail. Because the data were collected at a single point in time, they do not allow direct observation of the temporal process through which resilience may unfold from responses to difficulty and resource use toward adaptation/recovery. The findings should therefore be understood not as direct evidence of the resilience process, but as stakeholder perspectives on factors associated with professional resilience.

CHAPTER 2

LITERATURE REVIEW

2.1 Digitalization in Education

Digitalization has become a central component of educational change. Digital technologies affect how learning materials are created and distributed, how teachers communicate with students and parents, how assessment is conducted, and how schools organize information and administrative processes. The COVID-19 pandemic accelerated this transformation and made the digital capacity of educational institutions more apparent (Aljanazrah et al., 2022; Timotheou et al., 2023). Digitalization is therefore often understood not merely as the adoption of devices or software but as an organizational and pedagogical transformation.

This transformation is changing teachers' work in several ways. In technology-rich classrooms, teachers are expected to make decisions about tool selection, classroom management, digital participation, and the pedagogical appropriateness of technological applications (Johler et al., 2022). An umbrella review examining teachers' roles in the context of digitalization in education likewise shows that teacher competence and teacher agency remain central to how technology is integrated into instruction (Wohlfart & Wagner, 2023). Digitalization therefore increases the importance of teachers' capacity not only to use technologies but also to interpret them pedagogically.

Teachers' digital competence is part of this changing professional role. Frameworks such as UNESCO's ICT Competency Framework for Teachers link digital competence with pedagogy, professional learning, curriculum, assessment, and school organization (UNESCO, 2018). Research on teacher education similarly emphasizes that digital competence should be developed not as an isolated technical skill but as part of professional preparation (Howard et al., 2021). These expectations may support instructional innovation, but they also create a need for continuous learning and adaptation.

In addition, digital competence may take on different meanings in different contexts. Studies from Türkiye indicate the importance of examining how teachers conceptualize digital competence and use it within their own pedagogical and cultural contexts rather than treating it only as a score (Alptekin & Taneri, 2025). Differences in infrastructure, school type, educational level, subject area, and local support may influence the extent to which a teacher can translate digital knowledge into practice. This contextual variation becomes particularly important when digitalization is considered in relation to professional resilience.

From this perspective, digitalization can be viewed as a cross-cutting dimension of teachers' work. On the one hand, it may create demands such as continuous updating, new communication channels, ethical responsibilities, and changing expectations; on the other hand, it may provide resources such as instructional materials, professional learning, communication networks, and AI-supported tools. Whether a particular technology functions as a demand or a resource may depend on the teacher's competencies and the conditions under which it is used. The consequences of digitalization for teachers should therefore be evaluated not only in terms of technology use but also in terms of how teachers adapt to changing demands and which resources are available to them. This connection makes teacher professional resilience, discussed in the next section, an important explanatory framework for digitalization.

2.2 Teacher Professional Resilience

Resilience has been understood as a process of positive adaptation rather than as a rare personal trait. Developmental research suggests that resilience emerges from ordinary adaptive systems and from interactions between individuals and their environments (Masten, 2001). Earlier conceptual work has likewise cautioned against reducing resilience to a single fixed characteristic and has emphasized the importance of adversity, adaptation, and context in defining the construct (Luthar et al., 2000).

In education, teacher resilience has been used to explain how teachers sustain their functioning, adapt, and maintain professional commitment when they

encounter recurring difficulties. Studies with teachers have linked resilience to the capacity to maintain commitment and effectiveness under challenging professional conditions (Brunetti, 2006; Gu & Day, 2007). A comprehensive review of teacher resilience similarly defines the construct as a dynamic and multidimensional process shaped by risk and protective factors at personal and contextual levels (Beltman et al., 2011; Mansfield et al., 2012).

Teacher professional resilience should also be distinguished from teacher well-being. Whereas well-being refers to teachers' psychological, emotional, social, and professional experiences and conditions, resilience concerns the process of responding and adapting when demands or difficulties are present (Hascher & Waber, 2021). Although the concepts are related, they are not interchangeable. A model integrating teacher well-being and resilience proposes that personal, relational, and contextual factors may contribute to both, while resilience may influence how teachers navigate challenging experiences over time (Hascher et al., 2021).

In this thesis, conceptual boundaries are maintained by distinguishing related constructs from professional resilience. Well-being refers to teachers' psychological, emotional, social, and professional states. Coping refers to cognitive and behavioral efforts used to manage particular demands. Technostress is the experience of stress associated with the use of digital technologies and the demands of adapting to them. Digital competence refers to the knowledge and skills required to use digital tools appropriately from technical and pedagogical perspectives.

None of these constructs is equated with professional resilience on its own. Coping actions and digital competence may function as protective resources or strategies under certain conditions. Technostress may emerge as a pattern of strain or risk. Well-being, although related to resilience, is a distinct professional state and outcome domain. Professional resilience refers to the broader adaptive framework of responding to difficulty, drawing on available resources, and sustaining professional functioning (Hascher & Waber, 2021; Hascher et al., 2021; Jurić et al., 2026; Lazarus & Folkman, 1984; Yang et al., 2025).

The Job Demands-Resources (JD-R) Model classifies the physical, psychological, social, and organizational aspects of work into two main categories according to their functions (Bakker & Demerouti, 2017). Job demands are aspects of work that require sustained effort and may be associated with physical or psychological costs. Job resources are aspects that facilitate employees' attainment of goals, reduce the costs of demands, or support development.

In this thesis, the JD-R approach is used to interpret how digitalization-related factors may function as demands or resources within teachers' work. Technostress, digital workload, continuous accessibility, and adaptation requirements may function as demands. Professional development, colleague support, technical assistance, and supportive leadership may function as resources. The JD-R approach has also been used in teacher-resilience research to structure occupational demands and the resources that may support resilience (Lu et al., 2024).

Conservation of Resources (COR) Theory proposes that individuals strive to obtain, protect, and build resources they value, and that stress may arise when these resources are lost, threatened with loss, or fail to yield sufficient returns after investment (Hobfoll, 1989).

In this thesis, COR is used to interpret why digitalization-related demands may generate cumulative professional strain rather than remaining isolated events. For example, a technical disruption may be more than a technological problem; it may simultaneously consume multiple resources such as time, attention, perceived control, professional confidence, and emotional energy. The way recurring demands connect such resource losses helps explain why digitalization-related risks to professional resilience need to be considered together.

The Social-Ecological Resilience Approach explains resilience not solely as an internal capacity possessed by the individual but in relation to accessible and contextually meaningful resources in the individual's social, cultural, and institutional environment (Ungar, 2011).

In this thesis, this approach is used to explain why factors such as technological infrastructure, technical support, school leadership, colleague

relationships, school conditions, and local conditions are not merely background variables. These factors are active contextual conditions that shape how teachers encounter demands and gain access to resources. Research on teacher resilience similarly indicates that organizational, relational, and environmental factors may be as important as individual characteristics (Ainsworth & Oldfield, 2019). A bioecological review of teacher stressors and coping also draws attention to demands that arise at different system levels and cannot be managed by the individual teacher alone (Ghasemi, 2025).

These three approaches are used in this thesis not as competing or statistically tested models but as complementary conceptual lenses that illuminate different aspects of the research problem. The JD-R approach highlights the demand–resource balance, COR highlights the logic of resource loss and cumulative strain, and the social-ecological approach highlights the availability, accessibility, and contextual nature of resources in the environment. Taken together, these approaches provide a theoretical basis for examining risks, protective resources and strategies, and contextual factors within the same analytical framework. The study does not, however, test these theoretical models or directly track the dynamic process of resilience over time. Instead, it qualitatively and descriptively examines stakeholder perspectives on factors interpreted through these lenses.

Similarly, risk, protective resource or strategy, and contextual factor are treated in this thesis not as mutually exclusive fixed types of phenomena but as analytical functions that a particular phenomenon may serve in a particular situation. For example, when technological infrastructure is inadequate and unreliable, it may function as a contextual barrier that makes teaching more difficult and creates additional demands. When it is reliable and accessible, it may provide a supportive context that facilitates the use of resources. Likewise, digital tools may function as risks or demands when they create overload, continuous accessibility, or uncertainty. When they save time, increase access to materials, or support professional learning, they may function as resources.

The analytical classification is therefore based not on the name of the phenomenon but on the function it serves in the relevant account. Building on this conceptual framework, the following sections first address risks and demands associated with digitalization, then the protective resources and strategies that may be used in response to those demands, and finally the contextual conditions within which they operate.

2.3 Digitalization-Related Risks and Teacher Professional Resilience

Teacher professional resilience is associated with a wide range of occupational risks independently of digitalization, including workload, emotional strain, challenging relationships, policy instability, organizational injustice, and difficult working conditions (Agyapong et al., 2022; Creagh et al., 2025; Nwoko et al., 2023). The purpose of this section is not to reclassify this entire risk domain, but to explain how digitalization may intersect with existing occupational demands and what new or intensified demands it may add to teachers' work. Digitalization does not replace general occupational risks; it may transform some of them, make them more salient, or add a new technological dimension.

One of the most prominent digital risks is technostress. Technostress refers to stress associated with the demands of using and adapting to information and communication technologies. Research in school and university teaching contexts has linked technostress with changing digital requirements, mental health and work outcomes, job performance, burnout, and job satisfaction (Borle et al., 2021; Estrada-Muñoz et al., 2020; Heredia-Gálvez & Millán-Barroso, 2026; Panisoara et al., 2020; Penado Abilleira et al., 2021; Tu et al., 2025). A recent systematic review focusing on school teachers indicates that technostress is influenced not by a single technological variable but by multiple creating and inhibiting factors (Yang et al., 2025).

Digital competence gaps and adaptation difficulties are closely related to this risk. Meta-analytic studies report limitations in educators' self-perceived digital competence, while school-based research indicates that access to technology does not in itself create the competence required to use it effectively in teaching

(Liesa-Orus et al., 2023; Nyathi & Joseph, 2024). Teachers may therefore face a dual demand: learning new systems while also deciding how to integrate them pedagogically. Continuous technological change can turn the need to learn from a one-time requirement into an ongoing demand. Digital work may also increase workload and blur temporal boundaries.

Online systems may require teachers to enter additional data, accelerate the circulation of documents, require continuous monitoring of platforms, or create expectations for communication outside working hours. Research with primary school teachers has linked intensive technology use and technostress with work-family conflict and health problems (Z. Wang et al., 2023). Studies with university teachers have also reported blurred work-life boundaries and their relationship with burnout and work outcomes (Sobral et al., 2025). Information overload adds another dimension by increasing the volume of material teachers must filter, evaluate, and respond to, with possible implications for decision making, productivity, and well-being (Shahrzadi et al., 2024). Technical disruptions and infrastructure limitations may likewise turn digital tools into additional demands.

Unstable internet connections, unusable devices, incompatible systems, or limited technical support can disrupt instruction and force teachers to develop alternative plans. Research in resource-constrained or rural contexts shows that limited infrastructure and insufficient digital resources can restrict technology integration even when teachers are willing to use technology (Nyathi & Joseph, 2024; Sepadi et al., 2025). The risk is therefore not only lack of access but also uncertainty about whether tools will function when needed. The growing use of artificial intelligence introduces another cluster of concerns.

Generative AI can support content creation and planning, but it also requires teachers to evaluate the reliability, accuracy, and pedagogical quality of generated outputs. Reviews of trust in generative AI and responsible AI in education have highlighted concerns regarding reliability, transparency, privacy, ethics, and responsible use (Lelescu et al., 2025; Zhu et al., 2025). When teachers are expected to use AI-supported tools without clear guidance, the need to verify outputs may itself become an additional cognitive and professional demand. AI may also affect

professional autonomy and perceptions of role. Data-driven systems can make teaching increasingly measurable, while AI-supported automation may alter decisions that were previously under teachers' control. Critical work on the datafication of education has emphasized the growing role of metrics and digital data in defining educational practice (Williamson et al., 2020).

Research on generative AI and academicians' well-being has likewise suggested that rapid integration of AI may create uncertainty about changing professional expectations (Liu et al., 2025). These trends raise questions about autonomy, professional identity, and the boundaries of teacher responsibility. Students' use of digital technologies and AI may create additional risks. Teachers may have to deal with distracting technology use, cyberbullying, inappropriate use of AI in assignments, or uncertainty about whether student work reflects genuine learning. Research on cyberbullying has also shown that exposure to students' online problems may be associated with teacher burnout and productivity loss (Ferreira et al., 2021). Digitalization therefore changes not only teachers' own work practices but also the student behaviors and learning processes teachers are expected to oversee.

These risks indicate that digitalization should not be reduced to technostress alone. Digital competence gaps, workload, work boundaries, technical disruptions, content reliability, ethics, student use, and professional autonomy may emerge separately or together. At the same time, the same digital demand cannot be assumed to produce the same outcome for every teacher; how a demand is experienced may depend on the personal, social, and institutional resources available to the teacher. Listing risks alone is therefore insufficient from a professional resilience perspective. The next section addresses resources and coping strategies that may serve protective functions in response to digitalization-related demands.

2.4 Protective Resources and Coping Strategies in the Context of Digitalization

In the face of digitalization-related demands, it is necessary to examine not only which difficulties teachers encounter but also which resources and strategies

they can draw on while managing those difficulties. Coping refers to the changing cognitive and behavioral efforts individuals use to manage demands they appraise as taxing or exceeding their resources (Lazarus & Folkman, 1984). This process-oriented definition is consistent with teacher resilience because it does not assume that effective coping is a fixed personal trait. In this thesis, coping is considered a response domain that may vary particularly according to the nature of digital demands, how the teacher appraises those demands, and the personal, social, professional, and institutional resources available at a given time.

Personal and psychological resources form an important part of this process. Motivation, self-efficacy, emotion regulation, flexibility, and a sense of professional meaning may help teachers interpret difficulties as manageable rather than insurmountable. Reviews of professional well-being identify individual and socio-emotional factors among the important influences on teacher outcomes (Nwoko et al., 2023). Emotion regulation has also been increasingly linked to teacher well-being, instructional quality, and professional development (Xu et al., 2026). Research with preschool teachers has shown that resilience mediates the relationship between mindfulness and professional identity, suggesting that psychological resources may interact with one another in processes of professional adaptation (Tang et al., 2025).

Digital self-efficacy and digital competence may function as more specific personal resources. When teachers understand digital tools and believe they can use them, the same technological requirement may demand less effort and create less uncertainty. Research conducted during periods of intensive digital teaching has linked resources and perceived competence with professional well-being and fewer negative outcomes (Stang-Rabrig et al., 2022). More recent studies also link digital competence with professional well-being and technostress, supporting the view that competence may function not only as a skill outcome but also as a protective resource (Jurić et al., 2026).

Professional learning and competence development are therefore important, particularly when professional development is continuous and closely aligned with actual teaching needs. Professional digital competence is not fixed and is especially

important for early-career teachers, who are adapting not only to the profession but also to digital norms (Masoumi & Noroozi, 2025). In contexts where teachers need support with pedagogical decision making, ethical use, content evaluation, and classroom integration, training that focuses only on the technical use of tools may be insufficient.

Another type of resource is social and professional support. Professional learning communities may strengthen teacher resilience by providing shared knowledge, problem solving, and relational support. This relationship is supported by a large teacher sample from eastern China in which professional learning communities were strongly associated with teacher resilience, partly through professional identity processes (J. Zhang et al., 2024). A qualitative study with Swiss teachers similarly showed that relational problem solving was a commonly used strategy for managing professional difficulties and positioned such strategies as part of a resilience process that helps sustain teacher well-being (Krummenacher et al., 2024).

Informal support from colleagues and access to people with technical expertise may be especially useful when digital problems require immediate solutions. Leadership and organizational support are also important resources. Perceived support from school administration has been linked to teacher resilience and burnout, particularly during periods of rapid change (Sokal et al., 2020). The direct association between organizational support and technostress further suggests that technology-related strain is not merely an individual problem (Solís et al., 2023). Supportive leadership can influence workload distribution, access to training, psychological safety, recognition, and the extent to which teachers can ask for help without feeling inadequate. Institutional policies may also support resilience by providing predictability and reducing unnecessary demands.

Clear rules for digital communication, reasonable documentation expectations, stable curricula, fair procedures, and explicit guidance regarding AI or digital ethics can help teachers understand what is expected of them. From a Job Demands-Resources perspective, such conditions may function as job resources because they reduce uncertainty and the effort required to manage competing

demands (Bakker & Demerouti, 2017). Digital tools themselves may also function as resources. Online professional learning, digital instructional materials, AI-based planning tools, and collaborative platforms can save time or increase access to information when they are used reliably and selectively.

This points to an important duality: the same digital environment may create overload in one situation and provide support in another. The protective value of technology therefore depends on purpose, competence, boundaries, and context. Boundary management is one strategy that responds to this duality. Selective technology use, protected non-work time, clear communication rules, and deliberate decisions about which platforms to use may reduce continuous accessibility and digital overload. These strategies do not reject digitalization; rather, they aim to make digital work more sustainable by keeping technological demands within manageable boundaries. However, the theoretical availability of a resource does not mean that a teacher can actually access or use it effectively. The next section therefore focuses on the technological, organizational, and local conditions within which risks and resources operate.

2.5 Contextual Factors Shaping Teacher Professional Resilience During Digitalization

Digitalization-related risks and the protective resources available to teachers are not independent of the contexts in which they occur. Research on educator well-being indicates that school conditions operate at individual, relational, and organizational levels, although organizational influences are often less visible than individual characteristics (Cann et al., 2022). In this thesis, contextual factors are treated not merely as background characteristics describing teachers' work settings but as conditions that may shape exposure to digital demands and the accessibility of protective resources. A contextual perspective therefore asks not only how teachers cope, but also what schools, communities, technological environments, and policy systems enable or constrain.

School climate and leadership are major contextual factors. Research with educators indicates that a supportive school climate may moderate the relationship between exposure to stress and adverse psychological outcomes (Nizri et al., 2024).

Ethical climate may likewise be associated with teachers' psychological and physical well-being (Borrelli et al., 2025). Recent research on school transformation processes also emphasizes teacher resilience in relation to both individual and organizational resources (Reintjes et al., 2025). These findings suggest that the same occupational demand may produce different outcomes depending on whether teachers experience their schools as fair, supportive, coordinated, and psychologically safe.

Technological infrastructure is another direct contextual factor in digitalization. Internet quality, device availability, access to software, classroom equipment, and system reliability determine whether digital teaching can be implemented as planned. A distinction should be made between the presence of technology and its functional accessibility. Even when a school has equipment, teachers may experience limited access, unstable connections, or poor alignment with their pedagogical needs (Sepadi et al., 2025).

Technical support and institutional responsiveness may also influence how quickly teachers recover from technical problems. Support is most protective when it is easily accessible, timely, and sufficiently knowledgeable to resolve the problem encountered. Teachers who repeatedly have to manage technical problems alone may experience infrastructure difficulties as sources of workload and stress, whereas reliable support reduces uncertainty and allows teachers to plan digital lessons with greater confidence.

School type, educational level, subject area, and professional position may also shape teachers' digital experiences. Studies have identified differences in digital competence across teacher groups and educational contexts (Tzafilkou et al., 2023). Some subject areas may benefit more from specialized software or hardware. Preschool, primary, secondary, vocational, or specialized educational settings may differ in curricular demands and in students' use of technology. A school's program status and allocation of resources may also affect access.

Career stage may influence how teachers interpret and manage change, although experience should not automatically be equated with higher or lower digital competence. Comparative research has identified differences in areas of

digital competence between preservice and in-service teachers (Momdjian et al., 2024). Early-career teachers may need support with both general professional adaptation and digital requirements, whereas experienced teachers may face difficulty updating established routines as technologies change.

Geographic and socioeconomic conditions may affect access to digital resources and support. Urban-rural differences in knowledge and attitudes regarding technology, infrastructure, and resource availability have been reported across various contexts (*M.* Li, 2025; Sepadi et al., 2025). Student and parent characteristics are also important because teachers' digital work takes place within relationships. Expectations of accessibility, digital access at home, students' digital literacy, and family support may shape how school-level digital policies operate in practice.

Crisis and emergency conditions make these contextual differences particularly salient. The COVID-19 pandemic was characterized by sudden, large-scale transitions to remote teaching before institutional systems or teacher preparation were fully developed (Aljanazrah et al., 2022; De Stasio et al., 2024). Crisis conditions may therefore magnify existing inequalities while also accelerating digital learning and institutional transformation. From a resilience perspective, crisis is treated not as a personal characteristic of the teacher but as a contextual condition that changes demands and resources. Understanding professional resilience in the context of digitalization therefore requires considering risks, resources, and contextual conditions together as different functional dimensions of the same professional experience rather than as disconnected variables. The following synthesis section integrates these three domains within a common research gap.

2.6 Synthesis of the Literature and Research Gap

The literature reviewed in the preceding sections indicates a substantial body of knowledge regarding risks to teacher professional resilience, personal and social resources, and organizational conditions. Evidence related to digitalization, however, is distributed across different lines of research, including technostress,

technology acceptance, digital competence, artificial intelligence, infrastructure, leadership, and organizational support. The research gap proposed here is therefore not that these constructs have never been studied. Rather, digitalization-related demands, the resources and strategies that may be used in response, and the contextual conditions in which these relationships occur are not always examined together within the same professional resilience framework. In addition, limited attention has been paid to how these three domains are foregrounded from different stakeholder positions.

A structured literature corpus comprising 254 unique studies published between 2021 and 2026 was used in the conceptual development of this study. The researcher reviewed this corpus in relation to risks, demands, protective resources and strategies, digitalization, and contextual conditions associated with teacher professional resilience. The corpus was used not as part of the empirical participant dataset but as a literature resource supporting conceptual synthesis, alignment of the open-ended questions with the analytical framework, and the initial analytical orientation. The process through which the corpus was constructed and its use within the thesis are described in greater detail in Chapter 3.

This pattern supported the decision to organize the study around three interconnected questions rather than a single digital construct. The first gap concerns the accumulation of risks. Digitalization-related difficulties are often classified under constructs such as technostress, competence, workload, ethical concerns, or infrastructure; however, teachers may encounter several of these demands simultaneously. A resilience perspective requires attention to how demands accumulate and how one strain may lead to further losses in resources such as time, energy, confidence, or control (Hobfoll, 1989). The second gap concerns the relationship between risk and protection. Research provides evidence regarding personal resources, digital competence, professional learning, social support, leadership, and organizational resources, but these resources are not always examined in direct relation to the digital demands they may buffer. The central question is therefore not only which resources are useful, but how teachers use them when particular digital difficulties arise.

The third gap concerns context. Digitalization is often approached through the setting in which teaching occurs or through the technology being used, while infrastructure, technical support, policy, school type, subject area, career stage, and local conditions may be treated as background characteristics. From a social-ecological perspective, however, these conditions have analytical importance for understanding patterns associated with professional resilience because they shape which demands teachers encounter and which resources they can access (Ainsworth & Oldfield, 2019; Ungar, 2011). This study seeks to connect these three gaps by examining risks, protective resources and strategies, and context within a common qualitative framework and by comparing the perspectives of teachers, school administrators, and academicians. Within this framework, digitalization is treated not as a uniformly positive or negative variable but as an intersecting work context that can create new demands, provide new resources, and relate to existing organizational and professional conditions in different ways.

Within this framework, the study's distinctive contribution is not to propose new variables assumed to be completely independent of one another, but to connect fragmented areas of existing knowledge within a single analytical framework and to show how these relationships converge or diverge across three stakeholder positions. This comparison places issues that stand out in teachers' everyday classroom experiences alongside organizational capacity and support processes, as well as higher-level discussions of ethics, policy, and professional development. The empirical counterpart of this contribution is demonstrated in the Findings and Discussion chapters through the integration of cross-stakeholder commonalities, divergences, and risk–resource–context relationships. The next chapter explains the method used to examine these perspectives.

CHAPTER 3

METHODOLOGY

This chapter explains the methodology of the study. It first presents the research design and the rationale for the open-ended qualitative survey approach, followed by the participants and sampling process, the data collection instruments and procedure, and the analytical approach. The final part of the chapter addresses the researcher's role and reflexivity, as well as credibility, transferability, dependability, confirmability, and ethical considerations.

3.1 Research Design

This study used a qualitative descriptive survey design. It was designed to describe teachers', school administrators', and academicians' perspectives on risks, protective resources and strategies, and contextual conditions associated with teacher professional resilience in the context of digitalization without implementing an intervention or altering the conditions under examination. The study therefore prioritized participants' accounts of these domains rather than causal testing or statistical generalization. The design was not intended to track directly the development or recovery process of resilience over time.

Data were collected through online forms containing open-ended questions. Online qualitative surveys can provide access to participants in different locations while allowing them to respond in their own words and at a time convenient to them (Braun et al., 2021). In this study, all three forms contained seven open-ended questions and covered the same three research-question domains—risks, protective resources/strategies, and contextual conditions. However, the questions were adapted to the professional position of each stakeholder group; therefore, although the forms contained the same number of questions, they were not identical in wording, focus, or the analytical function of particular items.

The research design was structured around the three research questions presented in Chapter 1. The first research question addresses how stakeholders describe risks they associate with teacher professional resilience in the context of

digitalization. The second addresses individual, social, and institutional protective resources and strategies, and the third addresses contextual factors, particularly institutional and technological conditions. These questions are intended not to test causal effects but to describe patterns in stakeholder perspectives and identify shared and divergent emphases across the three groups.

3.1.1 Use of the Conceptual Literature Corpus

During the conceptual preparation of the study, the researcher worked with a structured literature corpus comprising 254 unique publications. The final corpus consisted of peer-reviewed empirical studies published between 2021 and 2026. The search blocks used are summarized in Table 3.1.

Table 3.1
Search Blocks Used to Build the Conceptual Literature Corpus

Search block	Search terms
Population	teacher* OR educator* OR "teaching staff" OR "school teacher*"
Focal construct	resilien* OR "psychological resilience" OR "emotional resilience" OR "professional capital" OR "teacher wellbeing" OR "occupational wellbeing"
Level / context	"individual" OR "personal" OR "relational" OR "interpersonal" OR "social" OR "organizational" OR "systemic" OR "institutional" OR "contextual" OR "ecological"
Intervention / support	"intervention*" OR "strategy" OR "strategies" OR "support" OR "assistance" OR "approach*" OR "method*"

Note. The four blocks were combined with AND. Web of Science was searched in the TS field and Scopus in the TITLE-ABS-KEY field. The database filters were 2021–2026, Education/Social Sciences, article, and English.

After filters for year (2021–2026), subject area (Education/Social Sciences), document type (article), and language (English) were applied, 1,939 records were obtained in total: 697 from Web of Science and 1,242 from Scopus. After duplicates were removed, 1,454 unique records were screened at the title and abstract level; 1,069 records were excluded, leaving 385 studies for full-text assessment.

At the full-text stage, 131 studies were excluded. The recorded reasons were scope mismatch (n = 39), lack of full-text access (n = 30), an ineligible sample (n = 24), serious methodological limitations (n = 16), not being a primary empirical study (n = 11), and failure to meet the language criterion (n = 11). The 254 peer-

reviewed empirical studies that met the eligibility criteria were included in the final corpus. Within this thesis, the corpus was not treated as an additional empirical sample. Instead, it served as a literature resource supporting conceptual synthesis, development of the research questions and open-ended questions, and the initial analytical orientation.

A top-level summary of the coding output for the corpus is presented in Table 3.2. This summary documents coding occurrences in the 254-study conceptual literature corpus and is kept separate from the coding results of the empirical dataset comprising 54 participants. Original screenshots of the corpus coding interface are provided in Appendix I as process documentation.

Table 3.2
Conceptual Literature Corpus Coding Output Summary

Analytical area	Subcodes displayed in interface (*n*)	Coded segments shown in interface
RQ1 – Risk Factors	11	2,785
RQ2 – Strategies and Resources	11	1,685
RQ3 – Context and Conditions	11	3,077

Note. Counts reproduce the code-occurrence output displayed for the 254-study conceptual literature corpus. They are coded-segment counts, not counts of studies or participants, and they are separate from the 54-participant empirical dataset and its 426 coded segments. The separate "Keywords Check" folders visible in the original interface are not included in this analytic summary. Original interface screenshots are provided in Appendix I.

The researcher examined the bibliographic information in the full-review matrix together with the studies' aims and research questions, sample characteristics, methods and designs, data collection and analysis approaches, main findings, and recommendations. A narrower working version was then prepared for use in qualitative analysis software. It retained bibliographic fields and fields relating to risks and challenges under RQ1, protective resources and strategies under RQ2, and contexts and conditions under RQ3. This version supported a thematic review of the 254 publications within the risk–protective resource/strategy–context framework.

The literature corpus was used for three distinct purposes within the thesis. First, recurring risks, protective resources and strategies, and contextual conditions across the 254 publications were reviewed together to support the conceptual synthesis of the study. Second, this synthesis informed the development and review of the open-ended data collection questions so that they covered the risk–protective resource/strategy–context dimensions. Third, recurring concepts in the corpus supported the initial analytical orientation for examining the empirical data. The final empirical findings were not derived from the literature corpus. The corpus was kept separate from the participant dataset, and the empirical findings of the thesis are based solely on analysis of the 54 participants' open-ended responses.

This distinction is also important with respect to the reference list. The 254-publication literature corpus represents the broader pool of studies reviewed for conceptual preparation and analytical orientation; the REFERENCES section is not a complete inventory of that corpus. The REFERENCES section includes bibliographic records only for works directly cited in the thesis text. The number of publications in the literature corpus is therefore not expected to equal the number of sources in the thesis reference list. Similarly, 254 does not represent an empirical sample size or participant count; the empirical dataset consists of the open-ended responses of 54 participants.

3.2 Participants and Sampling

Participants were recruited through convenience sampling. Convenience sampling is a non-probability sampling approach based on collecting data from eligible individuals who are accessible to the researcher and willing to participate (Etikan et al., 2016). In this study, three stakeholder categories—teachers, school administrators, and academicians—were defined to encompass the different professional positions required by the research questions; however, individual participants within these categories were not purposively selected to represent particular characteristics. Eligibility was assessed on the basis of belonging to one of the relevant professional groups and voluntarily agreeing to respond to the open-ended form.

The types of information contributed by the three stakeholder groups were not treated as equivalent. Teacher responses captured the direct experiential dimension of digitalization in classroom and everyday professional practice. School administrator responses reflected the institutional and organizational dimension relating to school conditions, leadership, infrastructure, resource allocation, and support processes. Academician responses reflected conceptual, ethical, professional-development, policy, and system-level evaluations informed by their research and areas of expertise.

Accordingly, academicians' perspectives were not used to validate or invalidate teachers' experiences, but were analyzed as a complementary perspective arising from a different professional position. Likewise, the fact that all three groups referred to the same issue was not treated, in itself, as independent confirmation that a finding was true.

Participant recruitment was conducted through professional and academic networks accessible to the researcher. The researcher sent the online form to teachers, school administrators, and academicians whom he knew and who were eligible for the relevant professional group; other eligible and willing individuals were also recruited through these contacts. Teacher and school administrator participants were recruited in the Ankara context. Because access to eligible academician participants in Ankara was more limited, the form was also distributed to academicians in different cities through academic networks and referrals. The sample was therefore not designed to achieve a geographically balanced or representative distribution; it was formed on the basis of accessibility and voluntary participation.

The final qualitative analysis included 54 participants: 19 teachers, 17 school administrators, and 18 academicians. The teacher dataset initially contained 27 submissions. After seven duplicate, incomplete, or ineligible records were removed, 20 cases remained; one additional participant provided no analyzable content across the open-ended questions, resulting in 19 teachers in the qualitative analysis. Of the 20 school administrator submissions, three records were excluded in accordance with the study's exclusion criteria. Of the 19 academician

submissions, one was excluded because the open-ended responses contained no analyzable content. The resulting sample flow is summarized in Table 3.3.

In this study, analyzable content was defined as a participant-generated statement in at least one of the seven open-ended items that conveyed an interpretable meaning relevant to the study topic or research questions. Response sets consisting only of blanks, punctuation/placeholder marks, or responses that conveyed no interpretable meaning were not considered analyzable. By contrast, isolated blank responses and brief statements such as “no” or “none” were not grounds for participant-level exclusion when they conveyed a meaningful absence or deviant case in context. Participant-level inclusion was not determined by the number of meaning units; the criterion was the presence of at least one interpretable response relevant to the research focus among the seven open-ended questions. The concept of a meaning unit refers only to the unit of coding used in the subsequent analysis of included cases (Section 3.4).

Table 3.3
Final Analytical Sample

Group	Initial submissions	Excluded from qualitative analysis	Final *n*	Final %
Teachers	27	8	19	35.2
School administrators	20	3	17	31.5
Academicians	19	1	18	33.3
Total	66	12	54	100.0

Note. Participant-level exclusion required the absence of analyzable content across the open-ended response set. Analyzable content was defined as at least one interpretable participant-generated statement relevant to the study focus or research questions; isolated blanks did not trigger participant-level exclusion.

The teacher group consisted of 16 women and 3 men. The mean age was 44.3 years (standard deviation [*SD*] = 8.26; range = 28–60), and the mean total professional experience was 18.8 years (*SD* = 8.19; range = 2–32). Fourteen teachers worked in public schools and five in private schools. Eleven participants held bachelor’s degrees, seven held master’s degrees, and one was a doctoral student. Their educational contexts included high school, middle school, preschool, a Science and Art Center, and a district directorate of national education. Table 3.4 summarizes the demographic characteristics of the teacher group.

Table 3.4

Demographic Characteristics of Teacher Participants (n = 19)

Variable	Category	*n*	%
Gender	Female	16	84.2
	Male	3	15.8
Education	Bachelor's degree	11	57.9
	Master's degree	7	36.8
	Doctoral student	1	5.3
Career stage	Early (0–3 years)	2	10.5
	Middle (4–15 years)	3	15.8
	Experienced/late (16+ years)	14	73.7
School type	Public	14	73.7
	Private	5	26.3
Educational level/context	High school	8	42.1
	Middle school	6	31.6
	Preschool	3	15.8
	District Directorate of National Education	1	5.3
	Science and Art Center	1	5.3
Location	City center	9	47.4
	District center	10	52.6
Prior active remote/digital education experience	Yes	14	73.7
	No	5	26.3
Weekly ICT use	Every day	6	31.6
	Several times a week	5	26.3
	1–2 times a week	4	21.1
	None/very little	4	21.1

Note. Age: M = 44.26, range = 28–60. Total professional experience: M = 18.84 years, range = 2–32. ICT = information and communication technologies.

The school administrator group consisted of 9 men and 8 women. The mean age was 45.8 years (*SD* = 4.91; range = 37–53), and the mean total professional experience was 22.8 years (*SD* = 5.14; range = 14–32). All administrators worked in public-school contexts, and their educational qualifications ranged from bachelor's to doctoral degrees. Table 3.5 summarizes the demographic characteristics of the school administrator group.

Table 3.5

Demographic Characteristics of School Administrator Participants (n = 17)

Variable	Category	*n*	%
Gender	Male	9	52.9
	Female	8	47.1
Education	Bachelor's degree	5	29.4
	Master's degree	11	64.7
	Doctorate	1	5.9
Management experience	Early (0–3 years)	2	11.8
	Middle (4–15 years)	11	64.7
	Experienced/late (16+ years)	4	23.5
School type	Public	17	100.0
Educational level/context	High school	10	58.8
	Middle school	3	17.6
	Primary school	2	11.8
	Combined primary/middle school	1	5.9
	Science and Art Center	1	5.9
Location	City center	12	70.6
	District center	5	29.4
Prior active remote/digital education experience	Yes	10	58.8
	No	7	41.2
Weekly ICT use	Every day	10	58.8
	Several times a week	5	29.4
	1–2 times a week	2	11.8

Note. Age: M = 45.82, range = 37–53. Total professional experience: M = 22.76 years, range = 14–32.

The academician group consisted of 14 women and 4 men, with a mean age of 43.7 years (*SD* = 7.68; range = 31–58). The group included professors, associate professors, assistant professors, research assistants, and one lecturer. Eight academicians reported previous teaching experience at the K–12 level. Table 3.6 summarizes the demographic characteristics of the academician group.

Table 3.6

Demographic Characteristics of Academician Participants (n = 18)

Variable	Category	*n*	%
Gender	Female	14	77.8
	Male	4	22.2
Academic title	Professor	5	27.8
	Associate professor	7	38.9
	Assistant professor	3	16.7
	Research assistant (PhD)	1	5.6
	Research assistant	1	5.6
	Lecturer (PhD)	1	5.6
City	Ankara	11	61.1
	Istanbul	3	16.7
	Tokat	2	11.1
	Izmir	1	5.6
	Eskisehir	1	5.6
Academic work on teacher professional resilience	Yes	4	22.2
	No	14	77.8
Previous K–12 teaching experience	Yes	8	44.4
	No	10	55.6

Note. Age: M = 43.67, range = 31–58. Percentages may differ from 100.0 by 0.1 because of rounding.

3.3 Data Collection Instrument and Procedure

Data were collected through online forms developed for the study. The open-ended question domains were developed by the researcher based on review of the 254-publication conceptual literature corpus and the research questions, and the wording of the questions was revised with feedback from the supervisor and co-supervisor. Each of the three stakeholder forms contained seven open-ended questions. Before the open-ended section, each form included participation/consent items and demographic and professional questions appropriate to the stakeholder group. The identifier (ID) and timestamp fields in the response exports were technical data-management fields and were not treated as questionnaire items addressed to participants. Not all demographic and professional items were used as analytical variables in the final thesis; variables necessary to describe the sample and relevant context were reported, whereas all open-ended responses were considered for qualitative analysis.

In the teacher and school administrator forms, the first three questions provided complementary information on general professional-resilience risks, supportive resources/strategies, and school, region, subject-area, or educational-level context. Question 4 served as the primary prompt for the first research question (RQ1) because it focused on digitalization-related risks. Question 5 served as the primary prompt for the second research question (RQ2) because it focused on strategies, resources, and support, while Question 6 served as the primary prompt for the third research question (RQ3) because it focused on technological infrastructure, technical support, and digital practices. Question 7 provided space for additional views. Because participants could also provide content relevant to the research questions in items outside this primary mapping, coding followed the meaning of the response rather than question number alone.

The academician form also contained seven open-ended questions. Question 1 requested complementary evaluations of risk factors, Question 2 of protective factors and coping strategies, and Question 3 of elements specific to the Turkish teaching context. Question 4 asked for a conceptual evaluation of whether the dimensions of risk, protective resource/strategy, and context were sufficient to explain teacher professional resilience and was not used as a primary question for generating frequency-based answers to the research questions. Questions 5, 6, and 7 directly addressed digitalization-related risks (RQ1), individual, social, and institutional strategies (RQ2), and institutional/technological conditions (RQ3), respectively. Content from any open-ended item that clearly aligned with the analytical framework could be coded under the relevant research question.

The structural differences among the forms were considered when interpreting cross-group comparisons. Although all three forms contained seven open-ended questions, teacher and administrator questions were more directly adapted to professional and organizational experience, whereas academician questions were oriented more toward research-based, conceptual, and system-level evaluation. In addition, Question 4 in the academician form was not a direct RQ frequency prompt but a conceptual review question concerning the adequacy of the three analytical dimensions. A code appearing more frequently in one group

therefore does not, by itself, indicate that the group regarded the issue as more important or that a true group-level difference existed. Observed frequency differences may reflect not only stakeholders' professional and epistemic positions but also question wording and the items in which particular topics were addressed more directly. Table 3.7 summarizes the primary mapping of the open-ended questions to the research questions.

Table 3.7
Primary Mapping of Open-ended Questions to Research Questions

Research question	Teacher form	Administrator form	Academician form
RQ1: Risks	Q4 primary; Q1–Q3 and Q7 complementary	Q4 primary; Q1–Q3 and Q7 complementary	Q5 primary; Q1 complementary; relevant content from other items when substantive
RQ2: Protective resources and strategies	Q5 primary; Q1–Q3 and Q7 complementary	Q5 primary; Q1–Q3 and Q7 complementary	Q6 primary; Q2 complementary; relevant content from other items when substantive
RQ3: Contextual factors	Q6 primary; Q1–Q3 and Q7 complementary	Q6 primary; Q1–Q3 and Q7 complementary	Q7 primary; Q3 complementary; relevant content from other items when substantive

Note. All three stakeholder forms contained seven open-ended questions. Academician Q4 was a conceptual review item and was not treated as a primary frequency prompt. Academician Q5, Q6, and Q7 served as the primary prompts for RQ1, RQ2, and RQ3, respectively, while Q1–Q3 provided complementary content for the corresponding domains. Coding followed the meaning of the response rather than question position alone. Because the forms differed in wording, focus, and item function, cross-group frequencies are descriptive indicators of pattern visibility and should not be interpreted as direct measures of group-level importance or statistically comparable differences.

The forms were administered online. Participants were contacted directly through professional and academic networks accessible to the researcher, and some eligible individuals forwarded the form link to other eligible teachers, school administrators, or academicians in their networks. Before responding, participants were informed about the purpose of the study, the voluntary nature of participation, and the intended use of the data. They completed the form in their own time without a fixed response-length requirement. Participants entered their qualitative responses directly into the online form; there was no synchronous interview, no interviewer note-taking, and no opportunity for immediate follow-up or probing questions. Teacher and school administrator participants were recruited in the Ankara context. Because reaching a sufficient number of eligible academicians in

Ankara was difficult, academician recruitment was extended to eligible individuals in different cities. The forms were administered in Turkish. English reporting translations of all participant-facing form items are provided in Appendices B–D.

3.4 Data Analysis

The study employed a qualitative descriptive survey design, and the open-ended textual data were analyzed using qualitative content analysis. Qualitative content analysis provides a systematic approach to preparing, organizing, coding, and reporting textual data (Elo & Kyngäs, 2008). MAXQDA was used to organize codes, text segments, and document variables and to retrieve coded segments; coding decisions and analytical interpretations were made by the researcher. The analysis combined an initial conceptual orientation informed by the literature and research questions with subcodes developed from the data. It therefore did not involve applying a predetermined and fixed closed code list, nor was it conducted as a purely inductive analysis independent of the literature and research questions. The three research questions constituted the highest-level analytical categories, while subcodes were developed as recurring or analytically distinct meanings emerged in participant responses.

Analytical units were defined at two levels. At the case level, the source of analysis was the complete set of each participant's responses to the seven open-ended questions, thereby preserving each participant as a single case. The unit of coding was the meaning unit. Consistent with qualitative content analysis, a meaning unit was defined as a word, phrase, sentence, or set of contiguous sentences organized around the same core meaning or analytical idea and containing enough textual context to retain its meaning outside the immediate passage (Graneheim & Lundman, 2004). A meaning unit was therefore not mechanically equated with a single sentence; its boundaries were determined by where the analytical idea communicated by the participant began and ended. The meaning unit was not a sampling criterion for participant inclusion. Rather, it was the textual unit used to code responses from cases that had already met the inclusion criteria.

During preparation, response sets were first examined for analyzability, after which the researcher read the responses at the level of meaning units and assigned codes to relevant text segments. When an open-ended response contained more than one analytically distinct idea, those ideas could be treated as separate meaning units. When consecutive sentences continued the same meaning without introducing a new analytical point, they could be coded as one broader meaning unit. In this thesis, a "coded segment" refers to the coding output at the text-segment level assigned to a particular subcode. Accordingly, the number of coded segments is not the number of participants; the same participant may contribute to the same code more than once through different meaning units.

The distinction among the three top-level categories was based on the function of each meaning unit within the participant's account. A demand, difficulty, or threat was coded as a risk. An individual, social, or institutional factor that supported coping, adaptation, or professional functioning was coded as a protective resource/strategy. A condition that surrounded and shaped exposure to risks or access to resources was coded as a contextual factor. This functional classification allowed the same type of phenomenon to serve different analytical functions in different accounts.

The codebook was not created in a single step but was developed through a five-stage iterative process. In the first stage, the three research questions and the orientation derived from the 254-publication conceptual literature corpus established risk, protective resource/strategy, and context as the top-level analytical domains. Initial distinctions between general and digitalization-specific risks and resources were used only as an initial analytical orientation. A closed list of the final 35 subcodes was not fixed in advance at this stage.

In the second stage, as participant responses were coded at the level of meaning units, new data-driven subcodes were developed for recurring analytical distinctions or distinctions not adequately captured by existing codes.

In the third stage, code names and scopes were refined by comparing them with the data. When necessary, codes were renamed, narrowed or broadened, parent–subcode relationships were changed, and overlapping or unnecessary codes

were merged or removed. Analytical discussions with the supervisor and co-supervisor informed these refinement decisions, while empirical coding and final code assignments were carried out by the researcher.

In the fourth stage, whenever a new subcode was added or the scope of an existing code changed, previously coded teacher, school administrator, and academician cases were retrospectively reviewed to determine whether the updated code definition should also be applied to earlier cases.

In the fifth and final stage, after the codebook had been finalized, all 54 cases were reviewed again from the beginning to check for missing cross-codes, segments that should be moved to a more appropriate code, and the need for any additional subcode. No new subcode was required during this final audit. This outcome represents the result of a consistency audit conducted on the fixed dataset; it was not interpreted as a claim of theoretical or data saturation. The stages of the process are summarized in Table 3.9.

The final analytical codebook contains 35 subcodes. RQ1 comprises 15 risk codes, RQ2 comprises 9 protective-resource and strategy codes, and RQ3 comprises 11 contextual-factor codes. The final dataset contains a total of 426 coded segments: 135 under RQ1, 143 under RQ2, and 148 under RQ3. These values are segment-level measures indicating the number of textual segments/coding instances assigned to subcodes. They do not represent a count of unique participants or 426 independent participant views. The final coding summary is presented in Table 3.8.

Table 3.8
Final Coding Summary

Research question	Analytic focus	Number of leaf codes	Coded segments
RQ1	Risks	15	135
RQ2	Protective resources and strategies	9	143
RQ3	Contextual factors	11	148
Total	—	35	426

Note. Coded-segment counts summarize the 54-participant empirical dataset. Operational definitions, inclusion/exclusion criteria, and illustrative examples are provided in Appendix F; full-size hierarchical models are provided in Appendix E.

Table 3.8 provides a concise overview of the final analytical structure. The coded-segment totals are distributed across the three research-question domains and represent coding density rather than participant-level prevalence. Participant-level frequencies were calculated separately and are reported in the Findings chapter.

Table 3.9
Coding Development and Final Audit Process

Stage	Procedure and consistency check
1. Initial analytic orientation	The three RQs and the 254-publication conceptual corpus defined the top-level domains (risk, protective resources/strategies, and context) and provisional distinctions. The final leaf-code list was not fixed in advance.
2. First-cycle coding and data-driven refinement	Participant responses were coded at meaning-unit level. Recurrent or analytically distinct meanings not adequately represented by the current structure led to provisional data-driven leaf codes or refinements of existing codes.
3. Codebook refinement	Code names, scope, and hierarchy were compared against the data. Codes could be renamed, narrowed, broadened, moved within the hierarchy, merged, or removed. Advisor/co-advisor feedback informed these refinements; empirical coding remained the researcher's responsibility.
4. Retrospective re-scan	Whenever a new leaf code was added or a code boundary changed, previously coded teacher, school-administrator, and academician cases were re-read to determine whether the revised code should also be applied retrospectively.
5. Final whole-dataset audit	After the codebook was finalized, all 54 cases were reviewed again from the beginning to check missing cross-codes, possible reassignment of segments, and the need for any additional leaf code. No additional leaf code was required; this was a consistency audit, not a saturation claim.

Note. The stages describe the development and consistency checking of the coding framework for the fixed 54-case dataset. They do not constitute a claim of theoretical or data saturation. Full-size versions of the final hierarchical models are provided in Appendix E, and the complete operational codebook is provided in Appendix F.

Table 3.9 summarizes the iterative development and final audit of the codebook. The three final hierarchical structures are presented separately below so that each research-question domain remains legible; larger versions are retained in Appendix E.

The final hierarchical code-subcode structures are visualized in Figures 3.1–3.3. Larger and more detailed versions are retained in Appendix E. Original coding-interface screenshots for the empirical dataset of 54 participants are also provided in Appendix G as process documentation. Operational definitions, inclusion and exclusion criteria, and selected examples from the final coded-data

pool for each subcode are presented in the complete analytical codebook in Appendix F.

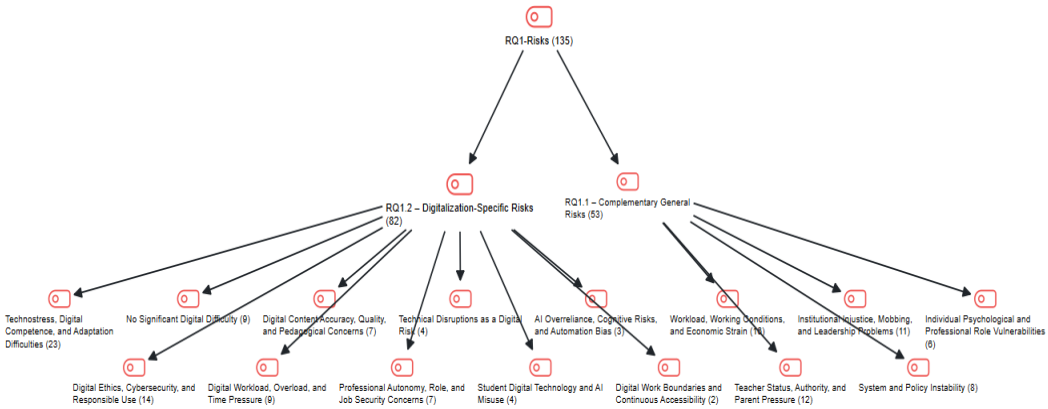

Figure 3.1
Hierarchical Code-Subcode Model for RQ1 Risks
Note. Numbers shown in parentheses are coded-segment counts and do not represent participant-level prevalence. A larger version is provided in Appendix E (Figure E.1).

Figure 3.1 separates RQ1 risks into complementary general risks and digitalization-specific risks. This hierarchy preserves the distinction between broader professional vulnerabilities and risks that arise specifically through digitalization.

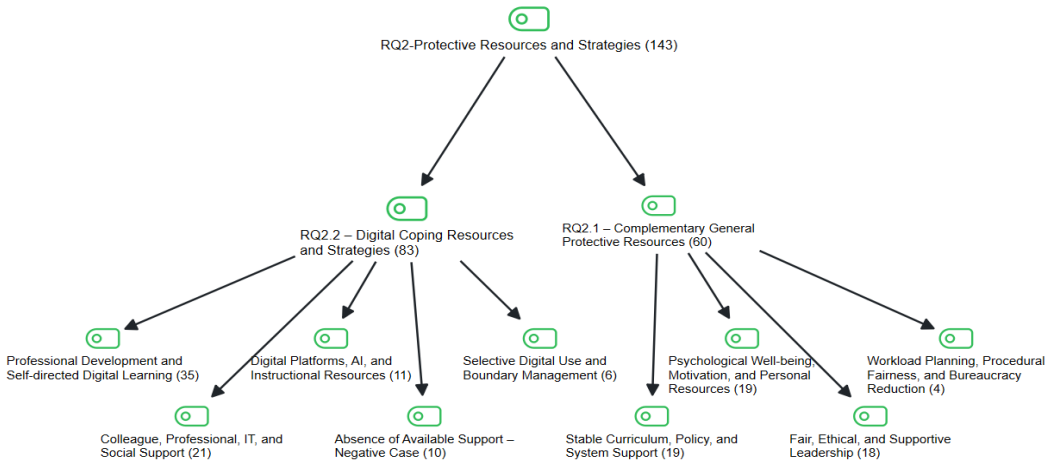

Figure 3.2
Hierarchical Code-Subcode Model for RQ2 Protective Resources and Strategies
Note. Numbers shown in parentheses are coded-segment counts and do not represent participant-level prevalence. A larger version is provided in Appendix E (Figure E.2).

Figure 3.2 organizes RQ2 into complementary general protective resources and digital coping resources/strategies. The structure therefore distinguishes broader professional supports from resources and strategies tied directly to digital work.

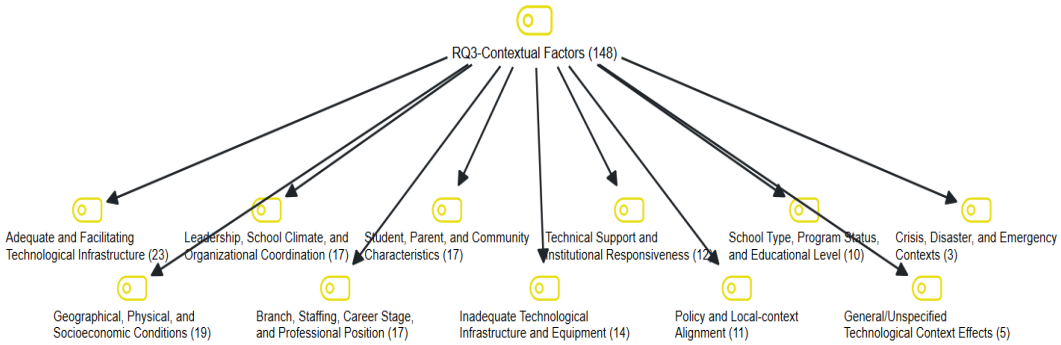

Figure 3.3
Hierarchical Code-Subcode Model for RQ3 Contextual Factors
Note. Numbers shown in parentheses are coded-segment counts and do not represent participant-level prevalence. A larger version is provided in Appendix E (Figure E.3).

Figure 3.3 presents the 11 contextual-factor codes used for RQ3. Together, Figures 3.1–3.3 show the final hierarchical organization of the 35 leaf codes; Appendix E provides the same models at a larger scale for detailed inspection.

Two different levels of counting were kept separate. The first is the coded-segment count: it indicates the number of textual segments assigned to a particular subcode and reflects coding density because the same participant may contribute to the same code through multiple distinct meaning units. The second is participant-level prevalence. This measure was calculated by converting the participant-code matrix to binary (0/1) form; even if a participant contributed one or more coded segments to the same code, the corresponding participant-code cell was counted only once. The final binary matrix contains 368 participant-code presences across the 54 participants. The *n* and percentage values reported in the findings are based on this second, participant-level measure, whereas 426 represents segment-level coding density.

To avoid treating the three research questions as entirely separate taxonomies, the participant-level binary code matrix was also cross-tabulated across RQ1, RQ2, and RQ3. In this integrative step, the analysis examined whether

a risk code, a protective resource/strategy code, and a contextual-factor code co-occurred within each participant. Cases in which all three codes appeared in the same participant's response set were summarized as participant-level intersection counts. This procedure did not create a new composite code, scale score, or inferential statistic. Its purpose was to identify relational clusters that occurred empirically within the same cases across patterns reported under separate RQs. The integrative matrix presented in the Findings chapter shows selected intersections that recurred and were analytically interpretable; intersection counts were not interpreted as causal direction, temporal sequence, mediation, or moderation effects.

Comparisons among the teacher, school administrator, and academician groups were descriptive only. Participant-level *n* and percentage values were used to show in which groups particular codes were more or less visible within this sample. However, because the question sets for the three groups covered the same research domains but were not completely identical, cross-group percentages were not treated as quantitative scores obtained under equivalent measurement conditions. A higher frequency was therefore not interpreted as evidence that the relevant group regarded the issue as more important, possessed more of the characteristic, or differed from the other groups in a substantive sense. Because the study is qualitative and subgroup sizes are small, no inferential significance testing was conducted and no causal claims were made.

At the reporting stage, code distributions were linked back to the three research questions and interpreted together with representative quotations. Quotations were selected from retrieved coded segments while preserving the link among each quotation, the participant identifier, and the relevant code. Open-ended responses were provided in Turkish and analyzed in their original language. Representative quotations were translated into English for reporting, with attention to preserving participants' intended meaning. In English reporting, T, SA, and AC function only as prefixes in anonymized participant identifiers: T denotes teacher, SA denotes school administrator, and AC denotes academician; the number following the prefix is the anonymized case number (e.g., T19). These prefixes are

not analytical codes. Analytically meaningful negative or deviant cases were also retained. This approach ensured that frequency patterns supported rather than replaced qualitative interpretation.

3.5 Researcher's Role and Reflexivity

In qualitative research, the researcher's academic and professional background, prior knowledge of the topic, relationship with participants, and initial assumptions may influence different stages of the research process, from formulating research questions to interpreting data. Reflexivity therefore does not require claiming that these influences can be eliminated. Instead, it requires the researcher to identify his position and potential influences explicitly and to question his analytical decisions systematically (Berger, 2015; O'Brien et al., 2014). In this study, the researcher's position and the procedures used to manage potential influences arising from that position are described separately below.

3.5.1 Researcher Background and Positionality

At the time the study was conducted, the researcher was a master's student who had completed coursework in the Computer Education and Instructional Technology program and was in the thesis stage. His academic background relevant to the research topic included educational experience in early childhood education, public administration, and computer/programming fields. He had also completed teaching practice in preschool education institutions in Türkiye, spent approximately six months at Oxford Brookes University Nursery School as part of an Erasmus traineeship, and briefly observed preschool education settings in Germany. The researcher also works as a public-sector employee. Although these educational and institutional experiences provided some prior familiarity with educational settings and the professional and organizational dimensions of digitalization, the researcher did not directly share the current professional role of any of the teacher, school administrator, or academician groups in the study.

During his master's education, the researcher completed coursework on research methods and developed practical experience with qualitative content analysis and qualitative data-analysis software through the analytical work

conducted for this thesis. He personally knew a small proportion of participants before the study; he had no prior personal relationship with most participants, and some were recruited through referrals from acquaintances. Participants were informed that the study was master's-level research, and participation was voluntary. Collecting data through an online open-ended form rather than face-to-face interviews limited the researcher's direct interaction while participants were responding. However, the possibility that the small number of prior acquaintanceships influenced some responses cannot be completely ruled out.

Before the study began, the researcher held a general expectation that digitalization could function for teachers both as a demand/risk and as a resource. However, it was not known in advance which patterns would appear more frequently, whether these patterns would look similar or different across teacher, school administrator, and academician groups, or how participants would make sense of this dual function. Because this initial assumption could increase the risk of seeing only expected patterns in the data, it was given particular attention during the analytical process.

3.5.2 Reflexive Procedures

The open-ended questions were developed by the researcher based on topic domains identified through review of the 254-publication conceptual literature corpus and were revised with feedback from the supervisor and co-supervisor. Similarly, codes, the codebook, analytical results, and emerging categories were shared with the supervisors throughout the research process; these discussions led to revisions such as repositioning some codes as subcategories, broadening their scope, or removing analytically unnecessary codes. Empirical coding, however, was conducted by a single researcher, and supervisor feedback was not treated as independent second coding or as an inter-coder agreement analysis.

To reduce the extent to which the researcher's initial expectations might unduly direct the analysis, the initial structure informed by the literature and research questions was not treated as a fixed coding system. In the iterative process detailed in Section 3.4 and Table 3.9, new distinctions emerging from the data were

incorporated into the coding system, and previously analyzed cases were retrospectively reviewed whenever a new code was introduced or the scope of a code changed. Reviewing all 54 cases again after the final codebook was established provided an additional check against focusing only on segments that supported expected patterns. Negative or deviant cases that did not align with dominant patterns were retained when analytically meaningful.

The same phenomenon was not assumed to belong to the same category in every instance; whether a statement was coded as a risk, protective resource/strategy, or contextual factor was determined according to its function within the participant's account. Teacher, school administrator, and academician perspectives were also not treated as the same type of knowledge; each group's distinct professional and epistemic position was preserved in interpretation. The researcher did not keep a separate reflexive journal or an in-software memo journal. Reflexive oversight was therefore maintained through repeated review of the codebook, retrospective rescanning, final auditing of all cases, retention of deviant cases, and analytical discussions with the supervisors. The analysis software was used not as a tool that interpreted on behalf of the researcher but as a data-management environment supporting the organization and tracking of data and codes.

3.6 Trustworthiness and Ethical Considerations

Research quality was addressed using Lincoln and Guba's (1985) criteria of credibility, transferability, dependability, and confirmability for qualitative research. These criteria were used not as direct equivalents of validity and reliability in quantitative research but as standards for evaluating the transparency and traceability of the qualitative research process and the clarity of the evidentiary basis for the findings. The researcher's position and reflexive procedures are described separately in Section 3.5.

3.6.1 Credibility

Credibility was supported through procedures aimed at preserving participants' meanings during analysis and linking findings directly to the data.

Participants' original open-ended responses were retained alongside coded segments, and direct quotations were used in the Findings chapter to support interpretations. The analysis did not focus only on dominant patterns; negative and deviant cases—such as statements indicating no significant digital difficulty, the absence of a particular resource, or another view that diverged from general patterns—were retained when analytically meaningful. The coding system was therefore not based on an assumption that all participants experienced digitalization in the same way.

The use of three stakeholder groups also made it possible to compare how the same research domain became visible from different professional positions. However, this structure was not used as a validation mechanism or as triangulation in the classical sense. Teachers' experiential evaluations, administrators' organizational evaluations, and academicians' research-based/conceptual evaluations were interpreted within their own epistemic positions. The fact that the forms covered the same research domains but were not completely identical was also taken into account; group frequencies were not treated as evidence that one group provided a more accurate, more important, or stronger view than another.

3.6.2 Transferability

Transferability was supported not by assuming that findings could be statistically generalized to broader populations, but by reporting the study context and participant characteristics with sufficient clarity. Relevant tables report that teachers and school administrators came from the Ankara context whereas academicians came from different cities, together with participant characteristics such as school type, educational level, subject area, career stage, administrative experience, and academic title. These details allow readers to consider the extent to which the findings may be transferable to their own educational contexts. Because convenience sampling was used, these descriptions are provided not as claims of representativeness but to clarify the limits and context of the sample.

3.6.3 Dependability and Confirmability

Dependability and confirmability were supported through an audit trail that increased the traceability of analytical decisions. Raw and cleaned datasets, the codebook and code summary, the coding structure, the participant-code matrix, retrieved coded segments, document variables, and final frequency tables were retained. The codebook was developed alongside the data during analysis. When a new subcode was added or the scope of a code changed, previously analyzed teacher, school administrator, and academician cases were retrospectively reviewed.

After the codebook had been finalized, all 54 cases were reviewed again from the beginning. The final audit checked for missing cross-codes, segments that should be moved to another code, and the need for any new subcode. The fact that no new subcode was required in the final audit represents only the final consistency check of the coding system within this fixed dataset; it is not a claim of data saturation. This process was intended to preserve the analytical link from the raw response to the coded meaning unit, code, participant, and reported frequency.

Codes, the codebook, and analytical results were shared with the supervisor and co-supervisor throughout the research process, and analytical decisions were reconsidered when necessary in light of these discussions. However, all empirical coding was conducted by a single researcher; no independent second coder, inter-coder agreement coefficient, or independent recoding was used. Supervisor feedback is therefore not presented as independent coder validation. Likewise, the qualitative data-analysis software was used not as an analytical agent that interpreted on behalf of the researcher but as a data-management tool supporting the organization and retrieval of data, codes, and relevant segments. These procedures do not eliminate researcher subjectivity, but they make the rationale for analytical decisions and their connection to the data more transparent and auditable.

3.6.4 Ethical Considerations

Ethical approval was obtained from the Middle East Technical University Human Research Ethics Committee before data collection (Protocol No. 0373-ODTÜİAEK-2026; see Appendix A). Participants were informed about the purpose

and scope of the study, the voluntary nature of participation, and how their responses would be used within the research; participation took place only after informed consent was provided.

Participant identities were protected during analysis and reporting. Final cases were represented by participant codes rather than names; identifying school names and unnecessary personal details were not included in the thesis. Raw and cleaned data were stored in access-controlled storage for audit purposes, and direct quotations were presented without unnecessary information that could reveal participants' identities.

CHAPTER 4

FINDINGS

Qualitative content analysis yielded 426 coded segments across the three research questions: 135 risk segments under RQ1, 143 protective resource/strategy segments under RQ2, and 148 contextual-factor segments under RQ3. A coded segment is a textual meaning unit assigned to a particular subcode. Because the same participant could contribute more than one distinct meaning unit to the same subcode, the total number of coded segments does not represent the number of participants or unique views. Frequencies and percentages in Chapter 4 are therefore used only to describe pattern visibility within this sample. The findings are presented together with the meanings of the coded content, direct participant quotations, and analytical relationships among the research questions. Participants responded in Turkish; direct quotations in this chapter were translated into English for reporting with attention to preserving their intended meaning.

Each of the three stakeholder forms contained seven open-ended questions and addressed the same broad risk–protective resource/strategy–context domains; however, the wording of questions, the analytical functions of particular items, and their focus according to stakeholders' professional positions were not identical. Group-level *n* and percentage values were therefore not interpreted as statistical comparisons, rankings of importance, or measured differences among stakeholder groups. The values were used to describe the extent to which particular codes were visible in teacher, school administrator, and academician accounts.

The findings are first presented by research question: Section 4.1 addresses risks (RQ1), Section 4.2 addresses protective resources and strategies (RQ2), and Section 4.3 addresses contextual factors (RQ3). To avoid treating these domains as independent lists, Section 4.4 examines risk–resource–context intersections within the same participants, Section 4.5 integrates shared and divergent stakeholder patterns, and Section 4.6 summarizes the most visible findings across the research questions. The chapter thus moves from detailed RQ-specific findings to cross-RQ and cross-stakeholder synthesis.

4.1 Perceived Risks Associated with Teacher Professional Resilience in the Context of Digitalization

The first research question examines how teachers, school administrators, and academicians describe risks associated with teacher professional resilience in the context of digitalization. A total of 135 coded segments were identified under RQ1. Risks were organized at two levels: digitalization-specific risks and complementary general risks associated with professional resilience but not limited to digitalization. Participant-level distributions across stakeholder groups are presented in Figure 4.1 and Table 4.1, while the hierarchical code-subcode structure for RQ1 is presented in Figure 3.1.

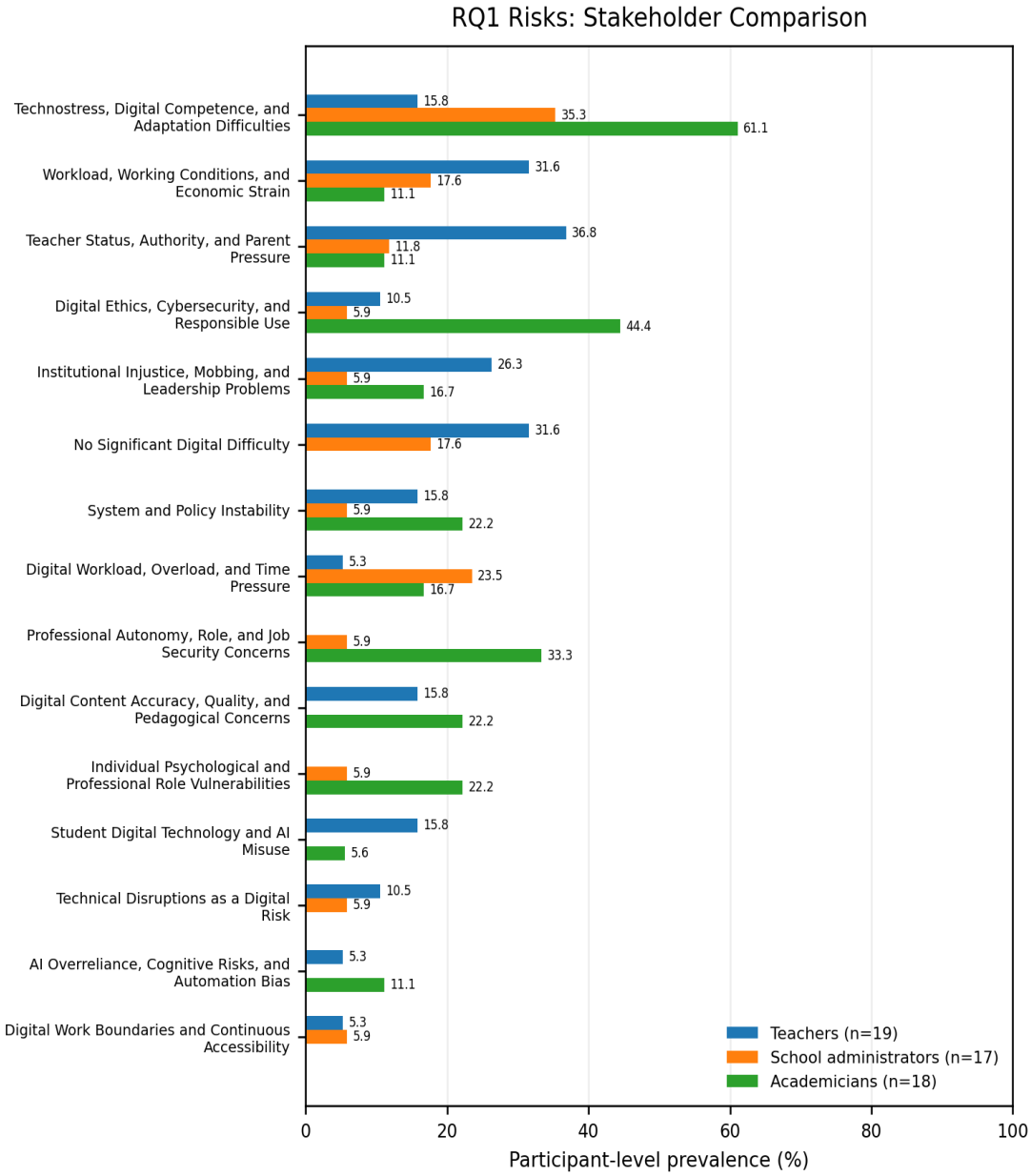

Figure 4.1

Participant-Level Distribution of RQ1 Risk Codes by Stakeholder Group

Note. Bars show participant-level descriptive prevalence within each stakeholder group (Teachers n = 19; School administrators n = 17; Academicians n = 18). The percentages indicate pattern visibility in this sample and do not represent statistically tested group differences.

Table 4.1

Participant-Level Distribution of RQ1 Risk Codes

Code	Total *n* (%)	Teachers *n* (%)	School administrators *n* (%)	Academicians *n* (%)
Individual Psychological and Professional Role Vulnerabilities	5 (9.3%)	0 (0.0%)	1 (5.9%)	4 (22.2%)
Institutional Injustice, Mobbing, and Leadership Problems	9 (16.7%)	5 (26.3%)	1 (5.9%)	3 (16.7%)
Workload, Working Conditions, and Economic Strain	11 (20.4%)	6 (31.6%)	3 (17.6%)	2 (11.1%)
Teacher Status, Authority, and Parent Pressure	11 (20.4%)	7 (36.8%)	2 (11.8%)	2 (11.1%)
System and Policy Instability	8 (14.8%)	3 (15.8%)	1 (5.9%)	4 (22.2%)
Technostress, Digital Competence, and Adaptation Difficulties	20 (37.0%)	3 (15.8%)	6 (35.3%)	11 (61.1%)
Digital Workload, Overload, and Time Pressure	8 (14.8%)	1 (5.3%)	4 (23.5%)	3 (16.7%)
Digital Work Boundaries and Continuous Accessibility	2 (3.7%)	1 (5.3%)	1 (5.9%)	0 (0.0%)
Technical Disruptions as a Digital Risk	3 (5.6%)	2 (10.5%)	1 (5.9%)	0 (0.0%)
Professional Autonomy, Role, and Job Security Concerns	7 (13.0%)	0 (0.0%)	1 (5.9%)	6 (33.3%)
AI Overreliance, Cognitive Risks, and Automation Bias	3 (5.6%)	1 (5.3%)	0 (0.0%)	2 (11.1%)
Digital Content Accuracy, Quality, and Pedagogical Concerns	7 (13.0%)	3 (15.8%)	0 (0.0%)	4 (22.2%)
No Significant Digital Difficulty	9 (16.7%)	6 (31.6%)	3 (17.6%)	0 (0.0%)
Student Digital Technology and AI Misuse	4 (7.4%)	3 (15.8%)	0 (0.0%)	1 (5.6%)
Digital Ethics, Cybersecurity, and Responsible Use	11 (20.4%)	2 (10.5%)	1 (5.9%)	8 (44.4%)

Note. Each cell reports *n* (%) for the indicated denominator: total sample $N = 54$; teachers $n = 19$; school administrators $n = 17$; academicians $n = 18$. Cross-group percentages are descriptive. Because the stakeholder forms covered the same broad RQ domains but were not identical in wording and item structure, frequency differences indicate pattern visibility within this sample rather than statistically comparable group differences or rankings of importance. AI = artificial intelligence. Operational code definitions and illustrative examples are provided in Appendix F; stakeholder all-code distribution visuals are provided in Appendix H.

The most prevalent risk pattern was technostress, digital competence gaps, and adaptation difficulties, which appeared in the responses of 20 participants (37.0%). This code was observed among 11 academicians (61.1%), six school administrators (35.3%), and three teachers (15.8%). Academicians generally explained this risk in terms of differences in teachers' competencies for understanding and using digital tools consciously.

> *Because many teachers do not have sound knowledge about how and when to use them, they have different perceptions of this issue. Their technology literacy is weak, so almost every concept related to digitalization has to be treated as a separate issue. Unfortunately, teachers in Türkiye differ greatly in their levels of use and understanding. (AC14)*

In school administrator responses, the same risk was visible mainly through the need to keep up with changing systems and through competence in digital teaching methods and techniques. In the teacher group, in addition to direct use of the term “technostress,” participants referred to insufficient practical knowledge and differences in digital literacy levels among stakeholders. This finding indicates that the demand for digital adaptation involves not only the technical use of tools but also continuous learning and pedagogical decision making.

Digital ethics, cybersecurity, and responsible use appeared in the responses of 11 participants (20.4%) and were more visible among academicians in this sample (8/18; 44.4%). Participants drew attention to uncertainty surrounding ethical and legal boundaries in the use of artificial intelligence, online reputation, privacy, and cyberbullying. One academician described the continuing lack of a clear regulatory framework for AI use as follows:

> *The lack of adequate and timely teacher training in every institution, and especially the fact that formal laws and regulations on the use of artificial intelligence and digital ethics have not yet been established at either the national or international level. (AC6)*

Student misuse of digital technology and artificial intelligence appeared in the responses of four participants. Although numerically less common, this pattern reflects teachers’ concerns about assessment and the authenticity of learning. One teacher described as problematic the direct use of generative AI by students to complete assignments intended to support children’s language development.

> *“Assignments I gave to support children’s language development being prepared directly using ChatGPT.” (T7)*

Digital workload, overload, and time pressure appeared among eight participants (14.8%), while digital work boundaries and continuous accessibility appeared among two. Digital workload was particularly visible among school administrators (4/17; 23.5%). One administrator linked e-School procedures and data entry extending beyond working hours with after-hours parent communication:

> *"You could say that the concept of working hours disappears. e-School tasks and data entry constantly extend beyond working hours, and messaging with parents on weekends or in the evenings can be digitally exhausting." (SA16)*

In the teacher group, the extension of online communication into private life was described in greater detail. This example shows that, beyond accelerating communication, digital communication can turn into a working arrangement in which the teacher is continuously accessible when boundaries of use are not clearly defined.

> *As preschool teachers, we always set up a WhatsApp group. The group we create for communication gradually goes beyond its limits. Problems can arise such as unnecessary familiarity with parents and intrusion into private life. Some parents want to be able to reach the teacher at any hour they choose. This was a major problem for me. (T2)*

Among the complementary general risks, teacher status, authority, and parent pressure, and workload, working conditions, and economic strain each appeared in the responses of 11 participants (20.4%). Both codes were more visible in the teacher group than in the other groups. Institutional injustice, mobbing, and leadership problems appeared among nine participants, while system and policy instability appeared among eight. These results indicate that difficulties arising from digitalization are not experienced independently of existing working conditions.

At the same time, nine participants stated that they had not experienced a significant difficulty during digitalization. This code appeared among six teachers (31.6%) and three school administrators (17.6%) but not among academicians. One teacher's statement, *"I did not have difficulty during the digitalization process. I*

use it actively." (T4), indicates that digitalization was not regarded as a risk by every participant. This deviant case is an important finding showing that risks may vary according to individual competence and contextual conditions.

When the RQ1 findings are considered together, a substantial proportion of the risks have analytical counterparts in the resources and conditions identified in the next two research questions. For example, digital competence and adaptation difficulties are demand areas that can be related to professional development and technical/professional support resources, while continuous accessibility and digital overload can be related to boundary-management strategies. Similarly, institutional injustice and leadership problems show why supportive leadership in RQ2 and school climate and organizational coordination in RQ3 need to be read together. These correspondences do not indicate causal effects; rather, they refer to related domains of meaning that appear under different analytical functions within the dataset.

4.2 Perceived Protective Resources and Strategies Associated with Teacher Professional Resilience in the Context of Digitalization

The second research question examines how teachers, school administrators, and academicians describe individual, social, and institutional protective resources and strategies associated with teacher professional resilience in the context of digitalization. A total of 143 coded segments were identified under RQ2. Participant-level visibility across stakeholder groups is presented in Figure 4.2 and Table 4.2, while the hierarchical code-subcode structure for RQ2 is presented in Figure 3.2.

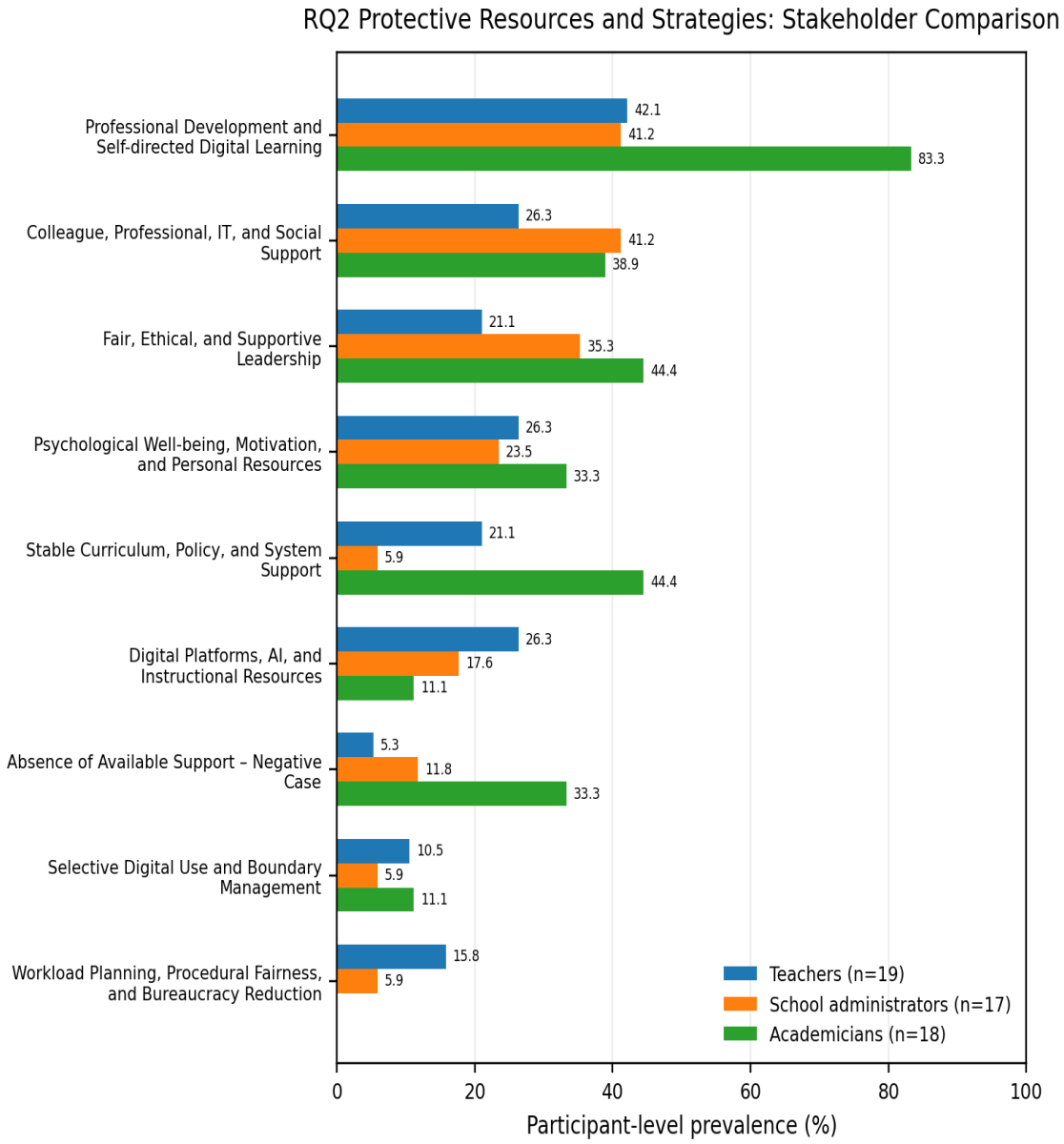

Figure 4.2

Participant-Level Distribution of RQ2 Protective Resource and Strategy Codes by Stakeholder Group

Note. Bars show participant-level descriptive prevalence within each stakeholder group (Teachers n = 19; School administrators n = 17; Academicians n = 18). The percentages indicate pattern visibility in this sample and do not represent statistically tested group differences.

Table 4.2
Participant-Level Distribution of RQ2 Protective Resource and Strategy Codes

Code	Total *n* (%)	Teachers *n* (%)	School administrators *n* (%)	Academicians *n* (%)
Fair, Ethical, and Supportive Leadership	18 (33.3%)	4 (21.1%)	6 (35.3%)	8 (44.4%)
Workload Planning, Procedural Fairness, and Bureaucracy Reduction	4 (7.4%)	3 (15.8%)	1 (5.9%)	0 (0.0%)
Psychological Well-being, Motivation, and Personal Resources	15 (27.8%)	5 (26.3%)	4 (23.5%)	6 (33.3%)
Stable Curriculum, Policy, and System Support	13 (24.1%)	4 (21.1%)	1 (5.9%)	8 (44.4%)
Professional Development and Self-directed Digital Learning	30 (55.6%)	8 (42.1%)	7 (41.2%)	15 (83.3%)
Selective Digital Use and Boundary Management	5 (9.3%)	2 (10.5%)	1 (5.9%)	2 (11.1%)
Digital Platforms, AI, and Instructional Resources	10 (18.5%)	5 (26.3%)	3 (17.6%)	2 (11.1%)
Absence of Available Support – Negative Case	9 (16.7%)	1 (5.3%)	2 (11.8%)	6 (33.3%)
Colleague, Professional, IT, and Social Support	19 (35.2%)	5 (26.3%)	7 (41.2%)	7 (38.9%)

Note. Each cell reports *n* (%) for the indicated denominator: total sample $N = 54$; teachers $n = 19$; school administrators $n = 17$; academicians $n = 18$. Cross-group percentages are descriptive. Because the stakeholder forms covered the same broad RQ domains but were not identical in wording and item structure, frequency differences indicate pattern visibility within this sample rather than statistically comparable group differences or rankings of importance. IT = information technology. Operational code definitions and illustrative examples are provided in Appendix F; stakeholder all-code distribution visuals are provided in Appendix H.

The most prevalent protective pattern was professional development and self-directed digital learning, which appeared in the responses of 30 participants (55.6%). In this sample, the code was most frequent among academicians (15/18; 83.3%), while the proportions in the teacher and school administrator groups were similar. Participants viewed continuous learning through in-service training, digital literacy, exploration of new tools, and pedagogical use as a central protective resource.

> *Based on my general reading on digitalization in education, it seems important for schools to have adequate technical infrastructure, for teachers to be provided with training on the conscious, ethical, and responsible use of technology, or for institutions unable to provide such training to direct teachers to reliable training resources. In addition, I think institutional policies should be updated to include risks arising from digitalization. (AC4)*

Teachers described this domain more in terms of their own learning efforts. Participating in online training, examining new educational models, and seeking in-service training in which newly learned practices could be reinforced through face-to-face experience appeared in this group's responses.

> *"Examining new educational models, participating in online training, and attending in-service training where we can experience innovations face to face." (T12)*

Colleague, professional, ICT, and social support appeared in the responses of 19 participants (35.2%). In this sample, this resource was more visible among school administrators (41.2%) and academicians (38.9%) than among teachers (26.3%). Different forms of support—such as obtaining technical assistance from ICT teachers, consulting experienced colleagues, establishing professional learning communities, and accessing expert support—were included under the same higher-level code. One school administrator explained the importance of a culture of shared learning during digitalization as follows:

> *I would also like to add that, in order to increase teachers' resilience during digitalization, it is critical to create not only infrastructure and technical support but also a culture of collective learning. Professional learning communities in which teachers can share their experiences help disseminate good examples of the pedagogical use of digital tools. (SA2)*

Fair, ethical, and supportive leadership appeared in the responses of 18 participants (33.3%). Although academicians and school administrators emphasized this resource more frequently, teacher responses described the dimensions of fairness, recognition, and trust in leadership in greater detail. One teacher expressed the relationship between internal evaluation and support mechanisms and professional resilience as follows:

> *Allowing every teacher to evaluate their administration would help prevent mobbing. A system in which diligence, achievement, and good work—not closeness to the administration—are recognized would also increase professional resilience. The presence of qualified administrators with fundamental values and an ethical understanding would create an atmosphere of trust and therefore increase motivation and professional resilience. (T4)*

Psychological well-being, motivation, and personal resources appeared among 15 participants (27.8%), while stable curriculum, policy, and system support appeared among 13 participants (24.1%). These two codes show that protective resources are not limited to digital skills. Emotion regulation, professional motivation, and personal boundaries were described as possible protective factors at the individual level; predictable policy, fair procedures, and supportive systems were described as protective factors at the broader organizational level.

Digital platforms, artificial intelligence, and instructional resources appeared among 10 participants (18.5%); participants viewed these tools as resources for diversifying materials, planning, and instructional flexibility. By contrast, absence of available support was coded as a separate negative condition in the responses of nine participants. The fact that this code appeared among six academicians (33.3%) indicates that academicians regarded the accessibility of support mechanisms as an important issue in their research-based and system-level evaluations; this finding was not interpreted, by itself, as direct evidence that support was in fact absent in particular schools.

Selective digital use and boundary management appeared in the responses of five participants. Although numerically less visible, strategies such as limiting communication outside working hours, reducing nonessential digital tasks, and using technology purposefully are directly related to the risks of continuous accessibility and digital overload identified in RQ1. Protective strategies therefore consist not only of adding new resources but also of managing the boundaries of digital demands.

The protective resources and strategies visible in RQ2 emerged not as simple opposites of the risks in RQ1, but as resources at different levels that may be used to cope with those demands. Professional development intersects analytically with digital competence and adaptation demands; boundary management with continuous accessibility; and colleague/ICT support and supportive leadership with technical and organizational difficulties. However, identifying a resource does not mean that it is accessible or functional in every

situation; the institutional, technological, and social conditions shaping resource availability are therefore examined separately under RQ3.

4.3 Perceived Contextual Factors Associated with Teacher Professional Resilience in the Context of Digitalization

The third research question examines how teachers, school administrators, and academicians describe contextual factors associated with teacher professional resilience in the context of digitalization, particularly institutional and technological conditions. A total of 148 coded segments were identified under RQ3. Participant-level visibility across stakeholder groups is presented in Figure 4.3 and Table 4.3, while the hierarchical code-subcode structure for RQ3 is presented in Figure 3.3.

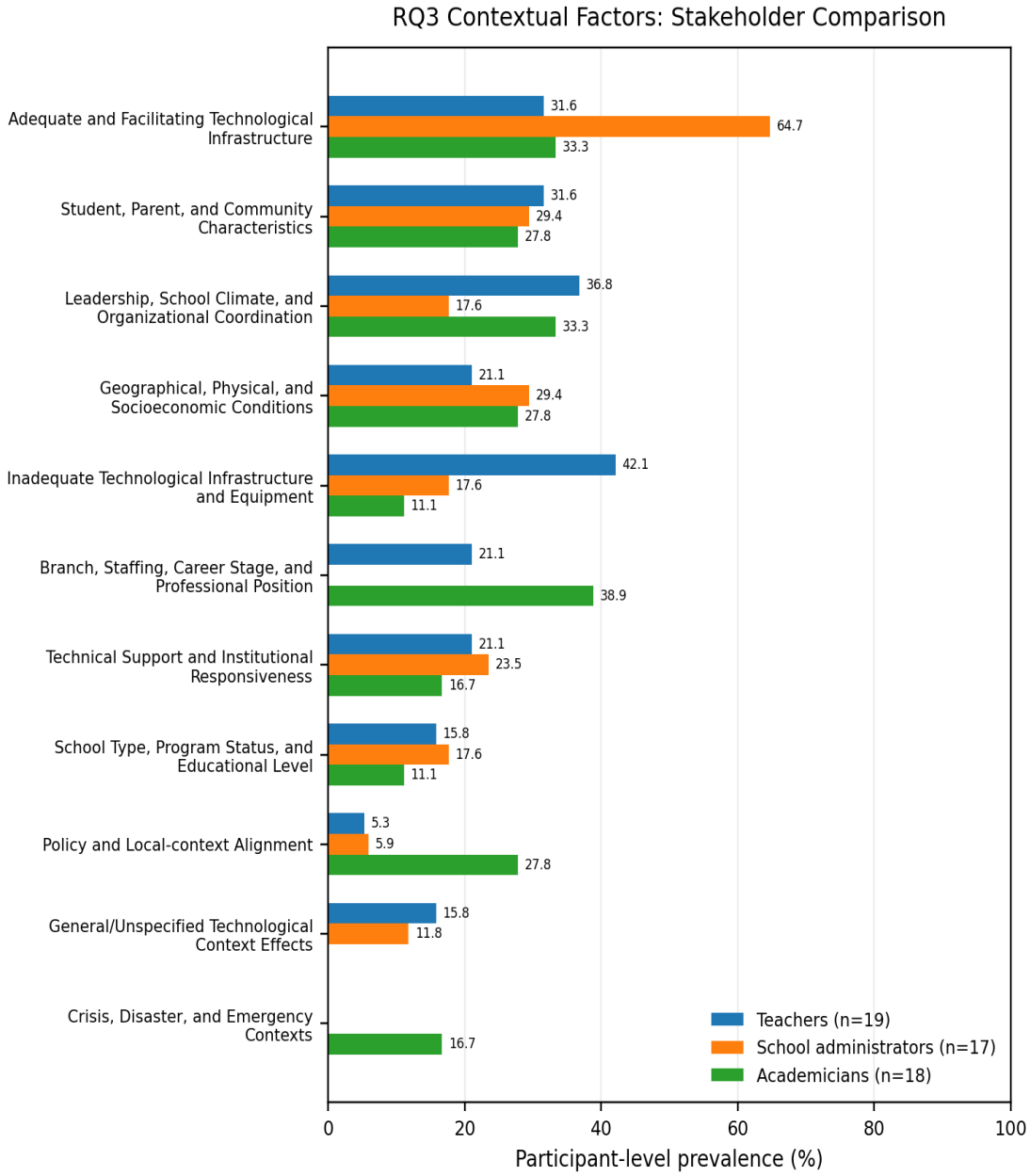

Figure 4.3

Participant-Level Distribution of RQ3 Contextual Factor Codes by Stakeholder Group

Note. Bars show participant-level descriptive prevalence within each stakeholder group (Teachers n = 19; School administrators n = 17; Academicians n = 18). The percentages indicate pattern visibility in this sample and do not represent statistically tested group differences.

Table 4.3

Participant-Level Distribution of RQ3 Contextual Factor Codes

Code	Total *n* (%)	Teachers *n* (%)	School administrators *n* (%)	Academicians *n* (%)
School Type, Program Status, and Educational Level	8 (14.8%)	3 (15.8%)	3 (17.6%)	2 (11.1%)
Branch, Staffing, Career Stage, and Professional Position	11 (20.4%)	4 (21.1%)	0 (0.0%)	7 (38.9%)
Technical Support and Institutional Responsiveness	11 (20.4%)	4 (21.1%)	4 (23.5%)	3 (16.7%)
Student, Parent, and Community Characteristics	16 (29.6%)	6 (31.6%)	5 (29.4%)	5 (27.8%)
Geographical, Physical, and Socioeconomic Conditions	14 (25.9%)	4 (21.1%)	5 (29.4%)	5 (27.8%)
Inadequate Technological Infrastructure and Equipment	13 (24.1%)	8 (42.1%)	3 (17.6%)	2 (11.1%)
Adequate and Facilitating Technological Infrastructure	23 (42.6%)	6 (31.6%)	11 (64.7%)	6 (33.3%)
Crisis, Disaster, and Emergency Contexts	3 (5.6%)	0 (0.0%)	0 (0.0%)	3 (16.7%)
Policy and Local-context Alignment	7 (13.0%)	1 (5.3%)	1 (5.9%)	5 (27.8%)
General/Unspecified Technological Context Effects	5 (9.3%)	3 (15.8%)	2 (11.8%)	0 (0.0%)
Leadership, School Climate, and Organizational Coordination	16 (29.6%)	7 (36.8%)	3 (17.6%)	6 (33.3%)

Note. Each cell reports *n* (%) for the indicated denominator: total sample $N = 54$; teachers $n = 19$; school administrators $n = 17$; academicians $n = 18$. Cross-group percentages are descriptive. Because the stakeholder forms covered the same broad RQ domains but were not identical in wording and item structure, frequency differences indicate pattern visibility within this sample rather than statistically comparable group differences or rankings of importance. Operational code definitions and illustrative examples are provided in Appendix F; stakeholder all-code distribution visuals are provided in Appendix H.

The most prevalent contextual code was adequate and facilitating technological infrastructure. This code appeared in the responses of 23 participants (42.6%) and was particularly visible among school administrators (11/17; 64.7%). Administrators stated that functional devices, uninterrupted internet access, and accessible digital resources could reduce teachers' stress and workload.

> *"Strong infrastructure support enables teachers to use digital tools without interruption, while adequate digital resources diversify learning materials and provide pedagogical flexibility." (SA2)*

At the same time, inadequate technological infrastructure and equipment appeared as a separate problem among 13 participants (24.1%). This code was more visible in the teacher group than in the other groups (8/19; 42.1%). Teachers evaluated infrastructure less in terms of the institution's general resources and more in terms of whether those resources could actually be used in the classroom.

Internet disruptions, lack of interactive whiteboards, and absence of technical personnel were examples that directly affected the conduct of instruction.

> *Negative. Because it is a new institution, its infrastructure is weak. For example, for two years we could not use the interactive whiteboards from May onward because of internet connection problems. Information technology classes could not be conducted. (T16)*

Technical support and institutional responsiveness appeared among 11 participants (20.4%). The visibility of this code across all three groups indicates that technological infrastructure consists of more than physical equipment. Participants treated how quickly a problem was resolved, whether someone was available to provide support, and whether the teacher was left alone during a lesson as contextual conditions.

Student, parent, and community characteristics and leadership, school climate, and organizational coordination each appeared among 16 participants (29.6%). Student motivation, parent intervention, expectations regarding digital technology, and relational arrangements within the school were described as conditions affecting how teachers experience risks. In the context of artificial intelligence, one academician noted that the level of digital expertise parents expect from teachers could create a new form of pressure:

> *When a parent treats artificial intelligence as an advisor, or expects the teacher to filter every piece of information for their children like a computer engineer, this may create unjustified pressure on the teacher and school administration. (AC14)*

Geographic, physical, and socioeconomic conditions appeared among 14 participants (25.9%). Transportation, housing, schools' physical facilities, students' economic conditions, and regional differences were considered under this code. Academicians related these conditions to teacher well-being and a sense of belonging to the institution, whereas teachers described transportation and physical conditions through concrete experiences in regions to which they had recently been appointed.

> *I think limited physical facilities in schools and failure to meet teachers' basic needs have cascading effects on their well-being and resilience.*

Because even not being able to use the restroom comfortably may affect their motivation toward the school and their sense of belonging. (AC16)

Subject area, staffing, career stage, and professional position appeared in the responses of 11 participants (20.4%). In this sample, the code was more frequent among academicians (38.9%) and was not directly coded in the school administrator group. Teacher responses drew attention to differences in access to physical and digital resources in particular fields such as preschool education and to the adaptation process of newly appointed teachers. Policy and local-context alignment appeared among seven participants and was especially visible in academicians' evaluations of whether national regulations fit the actual conditions of schools.

Crisis, disaster, and emergency contexts appeared in the responses of three academicians. Although numerically limited, this code indicates that digitalization may become a more intensive adaptation demand particularly during periods of sudden transition. The findings suggest that crises such as the pandemic can be understood not merely as temporary contexts but as circumstances that make the relationship between professional resilience and institutional and technological preparedness more visible.

The RQ3 findings indicate that how risks become visible and the extent to which protective resources can be used vary by context. In particular, the presence of both adequate and inadequate infrastructure as separate conditions in the same dataset shows that technological capacity cannot be treated as a single fixed characteristic. Leadership, school climate, technical responsiveness, student/parent characteristics, and local conditions also define the environment in which exposure to risks and access to resources occur. The domains presented separately in Sections 4.1–4.3 are therefore examined together in Section 4.4 through intersections at the level of the same participants.

4.4 Integrative Risk–Resource–Context Patterns

After the RQ1, RQ2, and RQ3 findings were examined separately, combinations in which risk, protective resource/strategy, and contextual-factor

codes co-occurred within the same participants' response sets were examined at the participant level. This second-level integration was intended not to show that one code caused another but to make visible how separate analytical domains clustered within the same cases. Table 4.4 shows selected intersections that recurred and were directly interpretable conceptually. The matrix is not a comprehensive ranking; patterns were selected particularly when they made visible a functional correspondence between risk and resource together with the contextual condition in which that relationship occurred.

Table 4.4
Participant-Level Risk–Resource–Context Co-occurrence Matrix

Risk / negative-demand pattern	Protective resource / strategy	Contextual condition	Overlap (*n*)
Technostress, Digital Competence, and Adaptation Difficulties	Professional Development and Self-directed Digital Learning	Adequate and Facilitating Technological Infrastructure	8
Technostress, Digital Competence, and Adaptation Difficulties	Colleague, Professional, IT, and Social Support	Adequate and Facilitating Technological Infrastructure	7
Digital Ethics, Cybersecurity, and Responsible Use	Professional Development and Self-directed Digital Learning	Adequate and Facilitating Technological Infrastructure	6
Institutional Injustice, Mobbing, and Leadership Problems	Fair, Ethical, and Supportive Leadership	Leadership, School Climate, and Organizational Coordination	3
System and Policy Instability	Stable Curriculum, Policy, and System Support	Leadership, School Climate, and Organizational Coordination	3
AI Overreliance, Cognitive Risks, and Automation Bias	Selective Digital Use and Boundary Management	Leadership, School Climate, and Organizational Coordination	2

Note. Each *n* is the number of participants whose response set contained all three listed leaf codes at least once. The matrix is descriptive and participant-level: it does not represent a new combined code, segment count, temporal sequence, causal pathway, mediation, or moderation effect. The selected configurations are intended to make analytically interpretable cross-RQ relationships visible rather than to rank all possible code intersections.

The most visible integrative pattern formed around digital adaptation difficulties. In the response sets of eight participants, technostress/digital competence/adaptation difficulties co-occurred with professional development and self-directed digital learning and with adequate and facilitating technological infrastructure. Among seven participants, the same risk pattern co-occurred with colleague, professional, ICT, and social support and with adequate infrastructure.

These intersections indicate that digital competence problems were not positioned in participant accounts merely as individual skill deficits; they were considered together with learning opportunities, social support, and technological conditions.

> *In the literature, institutional support conditions (technology infrastructure, professional development, technical support, participation in decision making) reduce technostress and strengthen resilience, whereas inadequacy of these conditions increases technostress and weakens resilience. (AC13)*

In some cases, this relationship was also visible as a direct risk–resource–context sequence. For example, SA17 described teachers' insufficient competence in digital teaching methods and techniques as a difficulty. The same participant identified professional development and project work among supportive practices and stated that stronger technological infrastructure, digital resources, and technical support increased teachers' capacity to cope with digitalization-related difficulties.

By contrast, T16 reported trying to participate in training related to digitalization. However, the fact that participation in in-service training depended on administrator approval and that weak internet infrastructure at the institution disrupted the use of interactive whiteboards showed that the presence of a protective resource alone might not be sufficient. These cases suggest that the effect of a resource may depend on contextual conditions that determine its accessibility and practical usability.

A similar functional contrast appeared in organizational patterns. Institutional injustice, mobbing, and leadership problems co-occurred in the response sets of three participants with fair, ethical, and supportive leadership and with leadership/school climate/organizational coordination codes. System and policy instability also appeared among three participants in the same response sets as stable curriculum/policy/system support and the school's organizational climate. These contrasting patterns show that phenomena such as leadership and policy are not fixed as only "risks" or only "resources"; depending on how they function in practice, they may create demands, provide protective resources, or become contextual conditions shaping access to resources.

In a smaller number of cases, AI overreliance and cognitive/automation risks co-occurred with selective digital use and boundary management in the context of leadership and school climate ($n = 2$). Although numerically limited, this pattern illustrates how the same digital tool may generate risk or become a more controlled resource depending on how it is used and on the institution's guiding conditions. Table 4.4 therefore supports reading the risk, resource, and context categories not as three independent lists but as analytical domains that can modify one another's functions in participant accounts.

4.5 Integrated Stakeholder Patterns

Stakeholder distributions across the three research questions were considered together within an integrative framework to identify patterns shared across all three groups, emphases that appeared more characteristically within a particular stakeholder group, and descriptive divergences. This comparison is not a new statistical test; it is an analytical synthesis of the binary participant-code prevalence values presented in Tables 4.1–4.3. Rather than repeating the complete distributions, Table 4.5 summarizes selected patterns that most clearly illustrate convergence and divergence among stakeholders.

Table 4.5

Integrated Stakeholder Pattern Matrix

Pattern	Descriptive stakeholder evidence	Integrated reading
Shared protective architecture	Professional development: T 42.1%, SA 41.2%, AC 83.3%; colleague/professional/IT/social support: 26.3%, 41.2%, 38.9%; psychological well-being/personal resources: 26.3%, 23.5%, 33.3%.	All three groups made learning, support, and personal/relational resources visible, although the relative emphasis differed.
Shared contextual sensitivity	Student/parent/community characteristics: T 31.6%, SA 29.4%, AC 27.8%; geographical/physical/socioeconomic conditions: 21.1%, 29.4%, 27.8%; technical support/responsiveness: 21.1%, 23.5%, 16.7%.	Across professional positions, resilience-related conditions were not framed as purely individual; surrounding social, material, and institutional conditions remained visible.
Teacher-characteristic emphasis	Teacher status/authority/parent pressure 36.8%; workload/working conditions/economic strain 31.6%; institutional injustice/leadership problems 26.3%; inadequate infrastructure 42.1%.	Teacher responses foregrounded immediate professional pressures and whether institutional/technological resources were usable in everyday practice.
Administrator-characteristic emphasis	Adequate/facilitating infrastructure 64.7%; colleague/professional/IT/social support 41.2%; professional development 41.2%; fair/supportive leadership 35.3%; digital workload 23.5%.	Administrator responses more often foregrounded organizational capacity, resource provision, coordination, and support mechanisms.
Academician-characteristic emphasis	Professional development 83.3%; technostress/digital competence/adaptation 61.1%; digital ethics/cybersecurity 44.4%; stable policy/system support 44.4%; branch/career/professional position 38.9%; autonomy/role/job security 33.3%.	Academician responses more often foregrounded conceptual, ethical, professional-development, policy, and system-level dimensions.
Descriptive divergence: infrastructure and digital difficulty	Inadequate infrastructure: T 42.1%, SA 17.6%, AC 11.1%; adequate infrastructure: T 31.6%, SA 64.7%, AC 33.3%. No significant digital difficulty: T 31.6%, SA 17.6%, AC 0%; technostress/adaptation difficulty: T 15.8%, SA 35.3%, AC 61.1%.	These contrasts indicate different visibility from different professional positions; they are not paired institutional disagreements or evidence of statistically different levels of actual difficulty.

Note. T = teachers (n = 19); SA = school administrators (n = 17); AC = academicians (n = 18). Percentages are within-group descriptive prevalence. The matrix summarizes selected patterns from Tables 4.1–4.3 and does not constitute an inferential comparison, ranking of importance, or matched teacher–administrator comparison. In quoted participant IDs, the same abbreviations function as stakeholder prefixes followed by the anonymized case number; they are not analytic codes.

Shared patterns were particularly apparent in protective resources and contextual conditions. Professional development, social/professional support, and psychological/personal resources appeared across all three groups; student–parent–

community characteristics, geographic and socioeconomic conditions, and technical support were likewise reported from all three stakeholder positions. This convergence does not mean that the groups validated one another. Rather, it indicates that, even from different professional positions, teacher resilience was not explained solely in terms of individual competence and that a multilevel structure of resources and conditions emerged across the data.

One of the clearest divergences concerned infrastructure. Inadequate technological infrastructure was reported more often by teachers, whereas adequate and facilitating infrastructure appeared more frequently among school administrators. Because the samples were not matched at the school level, this pattern cannot be interpreted as a direct contradiction between two groups within the same institution. Instead, administrator responses may have foregrounded the existence and capacity of resources at the organizational level, whereas teacher responses may have foregrounded whether those resources were consistently accessible, available, and pedagogically usable in the classroom. Similarly, the fact that the “no significant digital difficulty” pattern appeared among teachers and administrators but not academicians, together with the greater prominence of technostress, ethics, and policy themes among academicians, again indicates that direct experience and research-based system evaluation do not measure the same thing.

This integrative view supports treating stakeholder groups not as competing sources of knowledge but as complementary positions that foreground different levels of the same phenomenon. Teacher data emphasized everyday professional functioning and actual usability; administrator data emphasized organizational capacity and support mechanisms; and academician data emphasized ethical, policy, professional-development, and system-level risks and resources. Possible explanations for cross-stakeholder differences should therefore be sought not only in group characteristics but also in the issues and resources that are more salient from different professional positions.

4.6 Key Findings Across the Research Questions

The most visible patterns at the total-sample level in the final dataset are summarized together across the three research questions. Table 4.6 presents the exact total- and stakeholder-level *n*/% values for the most visible code within each RQ, while Figure 4.4 provides a comparative visual summary of the same three patterns. These summaries are not intended to diminish the importance of other codes within the relevant RQ, reduce the three research questions to a single code, or rank stakeholder groups; detailed code and stakeholder distributions are presented in Tables 4.1–4.3 and Figures 4.1–4.3.

Table 4.6
Most Visible Overall Pattern for Each Research Question

RQ	Most visible overall pattern	Total *n* (%)	Stakeholder visibility
RQ1	Technostress, Digital Competence, and Adaptation Difficulties	20 (37.0%)	T: 3/19 (15.8%); SA: 6/17 (35.3%); AC: 11/18 (61.1%)
RQ2	Professional Development and Self-directed Digital Learning	30 (55.6%)	T: 8/19 (42.1%); SA: 7/17 (41.2%); AC: 15/18 (83.3%)
RQ3	Adequate and Facilitating Technological Infrastructure	23 (42.6%)	T: 6/19 (31.6%); SA: 11/17 (64.7%); AC: 6/18 (33.3%)

Note. T = teachers (*n* = 19); SA = school administrators (*n* = 17); AC = academicians (*n* = 18). Values are participant-level descriptive prevalence from the final binary code matrix. The table identifies the most visible code within each RQ in the total sample and does not imply statistical significance, causal importance, or equivalence of the three stakeholder forms. In quoted participant IDs, the same abbreviations function as stakeholder prefixes followed by the anonymized case number; they are not analytic codes.

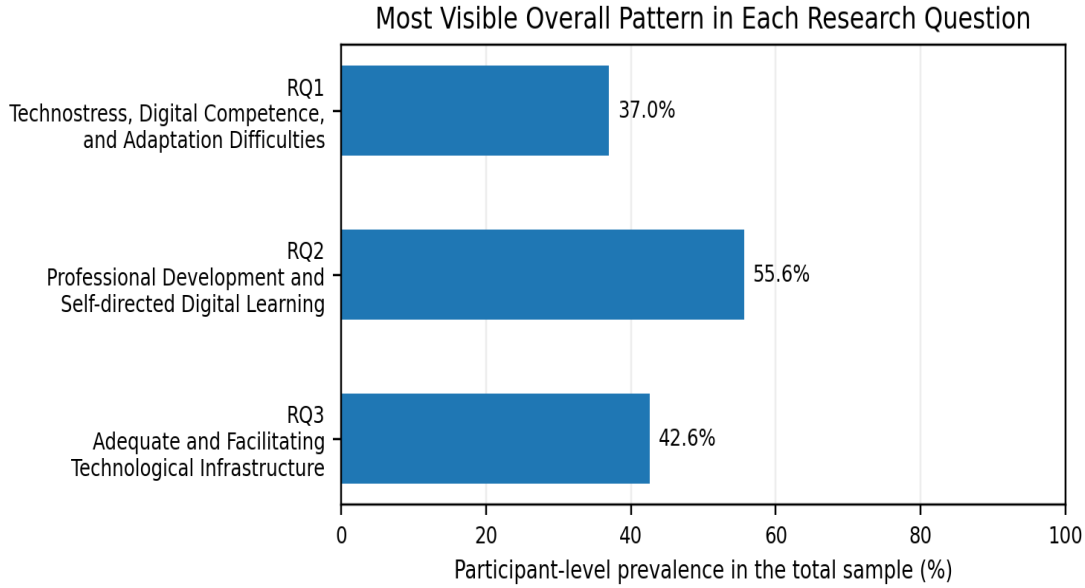

Figure 4.4

Most Visible Overall Pattern in Each Research Question

Note. Values are participant-level descriptive prevalence in the total sample (N = 54). The figure is a compact overview of the most visible code within each RQ; it does not indicate statistical importance or reduce the interpretation of each RQ to a single code.

When these three overall patterns are considered together, the central digitalization-related difficulty is described not simply as a negative attitude toward technology but as a preparedness issue linked to digital competence and the continuing need to adapt. At the same time, professional development and self-directed digital learning emerged as the most visible protective pattern, indicating that participants positioned continuous learning as a professional resource for responding to digital demands. Adequate infrastructure was the most visible contextual condition, further highlighting the importance of a functional technological environment in making these resources and competencies usable.

One of the most important cross-cutting findings across the research questions is that the same type of phenomenon can assume different analytical roles depending on the function it serves in the data. Digital communication extending beyond working hours and continuous accessibility were coded as risks under RQ1, whereas selective digital use and boundary management emerged as protective strategies under RQ2. Similarly, technological infrastructure appeared under RQ3

as a contextual condition that facilitates work when adequate and may intensify experiences of difficulty when inadequate.

Table 4.4 summarizes how such relationships co-occurred within the response sets of the same participants. Table 4.5 summarizes shared and stakeholder-characteristic emphases across these domains. The Chapter 4 findings therefore do not classify digitalization as inherently positive or negative. Rather, they show how demands, accessible resources, and contextual conditions are described from different professional positions and how they intersect within the same dataset.

CHAPTER 5

DISCUSSION AND CONCLUSION

Rather than simply restating the descriptive findings presented in Chapter 4, this chapter discusses what the observed patterns may mean for teacher professional resilience in the context of digitalization. The interpretation also considers the limitations of open-ended written responses collected at a single point in time. Accordingly, the relationships discussed here are not treated as direct evidence of the dynamic process of resilience over time or as causal effects. The discussion focuses on the conditions under which digital demands are experienced as risks, the resources that may support coping with these demands, and the ways contextual conditions may shape these relationships.

The central assumption underlying this interpretation is that digitalization is not inherently positive or negative. The same technology may function as a job demand when it consumes a teacher's time, attention, or professional control. It may function as a resource when it facilitates access to information, professional learning, or social support, and as a contextual condition through the infrastructure and organizational arrangements that enable or constrain these functions. Risk, resource, and context were therefore evaluated not as three independent lists but as analytical domains that may serve different functions within the same professional experience.

This functional interpretation draws on three theoretical lenses. The Job Demands-Resources Model enables demands such as digital adaptation, time pressure, and work intensity to be considered alongside resources such as professional development, social support, technical support, and leadership (Bakker & Demerouti, 2017). Conservation of Resources Theory draws attention to the cumulative costs of losing resources such as time, energy, control, and professional confidence. The social-ecological resilience approach emphasizes not only whether individuals possess resources but also whether those resources are accessible and usable in their environments (Hobfoll, 1989; Ungar, 2011). These frameworks are

not statistically tested in this study; they are used as conceptual lenses to interpret the qualitative findings.

Stakeholder differences were also interpreted within this framework as differences in epistemic position. Teachers made everyday classroom usability, workload, and student–parent interactions more visible; school administrators made organizational capacity, infrastructure, and support processes more visible; and academicians made research-based, ethical, professional-development, and policy-level issues more visible. These differences are not disagreements measured within matched institutions or statistical group differences. Because the forms covered the same broad research domains but were not identical in item wording or analytical function, group-level *n* and percentage values were used only to support descriptive visibility within this sample.

Accordingly, Section 5.1 discusses risks not merely in terms of which codes appeared more frequently but in terms of how digital demands combine with existing working conditions. Section 5.2 addresses protective resources in terms of the conditions under which they become accessible and functional without placing additional responsibility on teachers. Section 5.3 considers contextual conditions together with risk–resource–context intersections. Within this structure, the researcher's central interpretation is that risk, resource, and context are not immutable characteristics but analytical roles that depend on the function a phenomenon serves in participant accounts. The study's distinctive contribution lies not in proposing new variables, but in integrating this functional relationship with the different layers of knowledge foregrounded by teachers, administrators, and academicians at classroom, organizational, and system/conceptual levels. Frequencies are used not to rank importance but to support descriptive interpretation of the patterns.

5.1 Interpreting the Risk Findings

The central interpretation of the first research question is that digital risks may arise not from the mere presence of technology but from a mismatch between the demands technology creates or intensifies and the personal and organizational

resources available to teachers. Technostress, digital competence gaps, and the continuing need to adapt are therefore not simply problems of technical tool-use skills. They are job demands that require ongoing cognitive and temporal investment to keep up with new systems, evaluate pedagogical appropriateness, resolve problems, and respond to changing expectations. Studies linking teacher technostress with technological complexity, overload, continuous change, and perceptions of inadequacy support this interpretation (Z. Wang et al., 2023; Yang et al., 2025).

Although digital competence is important, the findings indicate that competence alone does not eliminate all digital demands. Even when teachers know how to use technology, they may still need to spend additional time keeping up with new systems, repeating the same work across different platforms, or interpreting digital tools pedagogically. Reducing competence gaps is therefore necessary, but investment in individual skills alone may have limited effects when work arrangements remain unchanged. The literature likewise emphasizes that digital competence should be considered together with pedagogical dimensions and that the mere availability of technological resources does not guarantee effective use (Liesa-Orus et al., 2023; Nyathi & Joseph, 2024).

Digital workload and work boundaries illustrate another pattern in which risks may be related more to the organization of work than to technology use itself. School administrators noted that e-School procedures, data entry, and institutional digital processes could increase time pressure, while teachers described in detail how communication with parents could extend into private life. Although digital communication increases speed, work can easily spill beyond working hours when accessibility boundaries are undefined. Research with primary school teachers has linked technology intensity and technostress with work-family conflict (Z. Wang et al., 2023), while broader research on teachers' workload and work intensification has also highlighted the problem of time poverty in the profession (Creagh et al., 2025).

Students' use of digital technologies and artificial intelligence emerged as a more practice-oriented risk among teachers. In particular, assignments completed

with generative AI may make it more difficult to evaluate students' genuine learning and may create a new responsibility for verification. This risk may be more salient to teachers because they directly and routinely assess the authenticity and pedagogical quality of student work. Although much AI research focuses on adoption, use, and pedagogical opportunities, teacher well-being, role change, and emerging responsibilities have received more limited attention (Liu et al., 2025; Tan et al., 2025).

Digital ethics, cybersecurity, and responsible use were especially prominent in academician responses. This pattern suggests that academicians evaluate digitalization not only in terms of current practices but also through legal and ethical frameworks. As data security, copyright, privacy, misinformation, and online reputation become part of teachers' everyday decision making, the teacher role extends beyond technical use to include ethical judgment. The increasing production and measurability of data in educational processes may also raise new questions about teacher autonomy and responsibility (Williamson et al., 2020).

An important finding for the first research question is that digitalization-specific risks and broader occupational risks appeared together in the same dataset. Teacher status, parent pressure, workload, economic difficulties, institutional injustice, and system instability can predate digitalization. However, digital systems may accelerate some of these problems, make them more salient, or transform them into new forms. For example, heavy workload may not originate in digitalization, but continuous data entry or digital communication outside working hours can intensify existing time pressure. Interpreting digital risks entirely separately from existing working conditions may therefore oversimplify teachers' actual experiences.

The fact that nine participants reported no significant digital difficulty provides an important counterexample showing that these risks are not inevitable. These responses suggest that the same digital demand may be appraised differently when individual competence, experience, work organization, and available support differ. Lazarus and Folkman's (1984) transactional approach to stress and coping explains that stress is influenced not only by the event itself but also by how the

person appraises it and the resources they believe are available for coping. The Job Demands-Resources Model likewise emphasizes that the effects of demands should be considered together with available resources (Bakker & Demerouti, 2017).

5.2 Interpreting Protective Resources and Strategies

The central interpretation of the second research question is that protective resources matter not simply because they exist, but because they are genuinely usable in managing digital demands. The prominence of professional development and self-directed digital learning suggests that continuing to learn in a rapidly changing digital environment is perceived as an important professional resource. However, this pattern should not be reduced to a simple prescription for "more training." The resilience literature likewise emphasizes that professional learning operates together with personal, relational, and contextual resources (Beltman et al., 2011; Mansfield et al., 2016).

At the same time, viewing professional development as a protective resource does not mean that responsibility for digital adaptation should be placed solely on the teacher. When teachers are expected to keep up with continuously changing tools through personal effort, the expectation of continual self-development may itself become an additional workload. Training may therefore be more meaningful when it is accessible, practice-oriented, sensitive to subject area and educational level, and complemented by institutional mechanisms through which teachers can obtain support when problems arise. Studies arguing that digital professional development should include pedagogical decision making and continuing support rather than one-off technical training support this interpretation (Howard et al., 2021; Timotheou et al., 2023).

Colleague, professional, ICT, and social support was another important finding for the second research question. Participants described several forms of support, including obtaining help from ICT teachers, consulting experienced colleagues, sharing experiences in professional learning communities, and seeking expert assistance when needed. Previous research has likewise shown relationships among professional learning communities, teacher resilience, and professional

identity (J. Zhang et al., 2024). The findings suggest that digital adaptation need not depend solely on individual learning; collaborative problem solving and the transfer of experience may reduce the burden on teachers.

The finding concerning fair, ethical, and supportive leadership shows how digitalization is connected with broader organizational conditions. Teachers' emphasis on fairness, recognition, and trust, together with administrators' and academicians' evaluations of supportive leadership, indicates that professional resilience does not depend solely on the presence of technical resources. An administrative approach that allows teachers to make mistakes while learning a new practice, does not penalize problem reporting, and establishes realistic workloads may facilitate digital adaptation. Administrative support has previously been associated with teachers' attitudes toward change, burnout, and resilience (Sokal et al., 2020; Z. Wang et al., 2023).

Although selective digital use and boundary management appeared among fewer participants, they are important because they directly respond to the findings on digital overload and continuous accessibility identified in the first research question. In some situations, strengthening resilience may require reducing an existing digital demand rather than adding a new tool. Limiting unnecessary notifications, setting boundaries for communication outside working hours, using shared templates, or selecting only tools with pedagogical value may protect teachers' time and attention. From this perspective, digital resilience is not synonymous with "being able to use more technology."

By contrast, the occurrence of the code "absence of accessible support" among nine participants indicates that access to resources was itself identified as a problem area. Academicians' more frequent emphasis on this code does not mean that they directly observed support levels in particular schools; rather, it shows that, from a system- and research-level perspective, they regarded accessible support as an important condition. The social-ecological approach to resilience emphasizes that positive adaptation is influenced not only by individual characteristics but also by accessible and meaningful resources in the person's environment (Ungar, 2011).

Reducing resilience solely to teacher motivation or self-efficacy may therefore obscure organizational causes of inadequate support.

5.3 Interpreting Contextual Influences

The central interpretation of the third research question is that context is not a passive background surrounding risks and resources, but an active set of conditions that shapes whether the same digital condition is experienced as a demand or as a facilitating resource. Technological infrastructure illustrates this functional difference clearly because participants described it both as adequate and facilitating and as inadequate. This pattern is consistent with research emphasizing that institutions' digital capacity should be considered not only in terms of devices and connectivity but also alongside leadership, teacher competence, support, and capacity for transformation (Timotheou et al., 2023).

At this point, the distinction between the presence of technology and its usability is important. The presence of an interactive whiteboard in a school does not mean that the connection is reliable or that a technical problem will be resolved quickly. If a teacher cannot trust that a system will work when a lesson plan depends on a digital resource, the infrastructure may fail to function as a resource even when it is physically present. In rural or resource-constrained school contexts, devices, connectivity, and sustainable technical support may jointly create problems (Sepadi et al., 2025). The findings of this study likewise indicate that actual access and reliability should be considered when evaluating infrastructure.

The similar visibility of technical support and institutional responsiveness across the three groups supports this interpretation. Participants focused not only on whether a problem existed but also on how quickly it was resolved and whether someone was available to provide help. Predictable technical support may help teachers integrate digital tools into lesson planning with greater confidence. By contrast, when solutions depend entirely on personal contacts or incidental assistance, the same technological equipment may create greater risk for the teacher.

The similar visibility of student, parent, and community characteristics and of leadership, school climate, and organizational coordination shows that digitalization is connected with the relational structure of the school. Parent expectations, students' ways of using technology, internal communication, and respect for teachers' decision-making space can change how the same technology is experienced. School conditions have previously been shown to affect teacher well-being at individual, relational, and organizational levels (Cann et al., 2022). Even when technical infrastructure is strong, therefore, a negative relational and organizational climate may make it more difficult for teachers to cope with digital demands.

Geographic and socioeconomic conditions, subject area and career stage, and policy–local context alignment revealed a broader environmental layer. Academicians' more frequent emphasis on these codes suggests that their research-based and system/policy-level professional positions foregrounded higher-level conditions that may be less salient in teachers' classroom and everyday professional experiences. This contribution was interpreted not as validation of teacher experience but as a different level of analysis. The same digital policy may not operate in the same way in a well-resourced urban school and in a resource-constrained region. Likewise, the pedagogical requirements of technology may differ across preschool, high school, and different subject areas. Previous research similarly indicates that digital competence may vary according to role and educational context (Tzafilkou et al., 2023).

The fact that crisis, disaster, and emergency contexts appeared only in academician responses suggests that this domain was considered primarily as a system-level preparedness issue. The pandemic experience showed that digital tools can rapidly become a mandatory work environment and that institutional technological preparedness can directly affect teachers' professional functioning. Crisis context can therefore be regarded not as a separate cause of digitalization but as a condition that makes existing risks and resource deficits more visible (Aljanazrah et al., 2022).

When Sections 5.1–5.3 are read together, the categories of risk, resource, and context appear less as labels attached to fixed phenomena and more as descriptions of the function a phenomenon serves in participant accounts. A messaging application may function as a resource by accelerating information sharing, but may become a demand when it creates expectations of continuous accessibility outside working hours. Artificial intelligence may reduce the time needed to prepare materials while increasing responsibility for verifying the authenticity of student work and the accuracy of content. The participant-level intersections in Chapter 4 likewise showed that these functional contrasts can co-occur within the same cases; however, such co-occurrence is not evidence of temporal sequence or causal mechanism.

The Job Demands-Resources Model provides a useful framework for explaining this dual structure. Continuous updates to digital systems, additional tasks, greater complexity, and time pressure can be considered job demands. Professional development, technical support, digital competence, colleague support, and supportive leadership may function as resources that reduce the costs of these demands. Job resources can support employees in attaining goals and reduce the costs associated with job demands (Bakker & Demerouti, 2017). The findings of this study likewise suggest that the same digital demand may be more manageable when support and competence are strong and more taxing when support and infrastructure are insufficient.

Conservation of Resources Theory helps explain why digital risks may not be fully understood when considered one by one. An internet disruption is not merely a technical failure; it may lead to lost time, disruption of the lesson plan, and a reduced sense of control. Messages outside working hours may reduce recovery time and contribute to energy loss. The idea that one resource loss can trigger further losses helps explain how seemingly small digital demands may accumulate through losses of time, attention, energy, and professional confidence (Hobfoll, 1989).

The social-ecological resilience approach likewise indicates that teachers' positive adaptation cannot be attributed solely to personal capacity. Even when

teachers have high motivation and digital knowledge, the effects of these personal resources may remain limited when internet access, devices, technical support, or administrative flexibility are absent. Resilience is understood as a process emerging from interactions between individuals and accessible resources in their environments (Ungar, 2011). In this study, the fact that teachers, administrators, and academicians described the same risks at different levels supports a multilevel interpretation of factors associated with professional resilience. However, this finding does not directly demonstrate the dynamic process of resilience over time.

In the literature on student-centered school education, digital resilience has been defined as a dynamic capacity to understand digital risks, learn appropriate responses, recover from digital stressors, and move forward with greater self-efficacy (Sun et al., 2022). The phenomenon examined in this thesis, however, is not limited to overcoming a particular digital problem. It concerns teachers' capacity to sustain pedagogical responsibilities, professional relationships, workload, and well-being during digital transformation. Digital resilience can therefore be regarded not as a separate construct that replaces teacher professional resilience, but as a dimension that becomes relevant under contemporary technological conditions.

This perspective also requires a more balanced interpretation of digital competence. A competence deficit may constitute a risk, whereas advanced competence may provide teachers with greater control, confidence, and access to resources. However, if a digitally competent teacher is assigned more online tasks, held responsible for every platform, or expected to be accessible at all hours, competence may also generate additional job demands. Studies showing that digital well-being is jointly influenced by individual skills and team- and organization-level resources support this multilevel interpretation (Yu et al., 2022).

The interpretation derived from the data is that digitalization is not a separate technological issue outside teacher professional resilience. A more explanatory approach is to treat digitalization as a work context that cuts across the relationships among risks, protective resources, and contextual conditions. This interpretation moves beyond the question "Can the teacher use technology?" and

requires joint consideration of the digital demands encountered, the resources that are actually accessible, how schools regulate these demands, and how reliable and usable the technological infrastructure is. The framework helps explain why participants associated digitalization with facilitation under some conditions, strain under others, and sometimes both functions at once, without assigning technology a fixed positive or negative value.

5.4 Implications

The practical and policy implications of this study are organized around five target groups: teachers, school administrators, schools and other educational institutions, professional development providers, and policymakers. The recommendations below are derived from the descriptive patterns in Chapter 4 and the interpretations in Sections 5.1–5.3; they should not be treated as causal conclusions demonstrating intervention effectiveness. Recommendations for research examining risk, resource, and context together in larger and more diverse samples are addressed in Section 5.6.

Implications for teachers. For teachers, digital competence should not be understood as limited to knowing the technical use of a tool. The findings make visible the combined need to evaluate pedagogical appropriateness, verify content accuracy, manage student use, make decisions about ethical and safe use, and adapt to new systems. Self-directed learning, seeking colleague/ICT support, and selectively using digital practices with limited pedagogical value or unnecessarily high workload are among the individual and relational strategies teachers can use. However, problems such as communication boundaries outside working hours or excessive digital tasks should not be left solely to teachers' personal ability to set boundaries; these strategies should be supported by institutional arrangements.

Implications for school administrators. For administrators, priorities include institutionalizing accessible technical support and digital mentoring mechanisms, regulating communication and task distribution through predictable rules, and creating a supportive school climate that does not negatively evaluate help-seeking, mistakes, or the process of adapting to new systems. Recourse to ICT

teachers, experienced colleagues, and experts indicates that these individuals can be important resources in practice; however, support should not remain dependent on the voluntary effort of particular individuals. Support teams with defined responsibilities, short guides, experience-sharing meetings, realistic data-entry timelines, and practices limiting nonurgent communication outside working hours may be considered. The relationship between professional learning communities and resilience (J. Zhang et al., 2024), the association of technology intensity and technostress with work-family conflict and health problems (Z. Wang et al., 2023), and the protective role of a positive school climate (Nizri et al., 2024) are consistent with these implications.

Implications for schools and educational institutions. Institutional digital capacity should not be evaluated only by the number of devices or connections; reliability, actual usability, downtime, access to technical support, and teachers' classroom- and subject-level experiences should also be monitored (Timotheou et al., 2023). Institutions may also develop clear principles for teachers, students, and parents regarding artificial intelligence, content reliability, privacy, cybersecurity, citation, and authenticity (Tan et al., 2025). Institutionally clarifying communication hours for students and parents, appropriate messaging practices, and digital-ethics expectations may reduce the need for teachers to manage every case individually.

Implications for professional development providers. In-service and other professional development programs should not be reduced to technical tool instruction; they should integrate pedagogical appropriateness, content verification, AI/digital ethics, management of student use, and adaptation to new systems through authentic classroom examples. Rather than offering the same program to all teachers, subject area, educational level, career stage, current digital competence, school support, and infrastructure conditions can be taken into account; continuity may be supported through accessible follow-up assistance and peer learning after training. Studies emphasizing that programs designed to strengthen teacher resilience should address personal, relational, professional, and contextual dimensions together support this approach (Mansfield et al., 2016).

Implications for policymakers. Teachers' adaptation to digital transformation should not be monitored solely through individual competence targets. When teachers are expected to adapt to new tools and practices, schools' connectivity quality, technical personnel, workload, communication norms, administrative support, and capacity for ethical guidance should also be part of policy design. Because of differences in subject area, school type, career stage, geographic and socioeconomic conditions, and local infrastructure, uniform practices may not operate in the same way everywhere; higher-level policy decisions should therefore be adaptable to local conditions. Sustainable digital transformation consequently requires not only providing more technology but also aligning technology use with working conditions and support systems.

5.5 Limitations

Several limitations should be considered when interpreting the findings. First, the sample was formed through convenience sampling and consisted of 19 teachers, 17 school administrators, and 18 academicians. Recruiting participants through networks and referrals accessible to the researcher may have led the sample to reflect the characteristics of those professional and academic networks more strongly. The fact that teacher and administrator participants came from the Ankara context while academicians participated from different cities also indicates that the geographic distribution was not balanced. Although this structure allowed comparison of three stakeholder perspectives, the findings cannot be statistically generalized to broader populations of teachers, administrators, or academicians.

The purpose of the study was not statistical generalization but detailed description of different perspectives on teacher professional resilience during digitalization. In addition, because the data consist of open-ended written responses collected at a single point in time, the study does not directly track the dimensions of professional resilience over time, including responses to difficulty, resource mobilization, adaptation/recovery, and maintenance of functioning. The findings should therefore be treated not as process evidence but as stakeholder perspectives on factors associated with professional resilience.

Second, demographic and professional distributions within the participant groups are not balanced. Experienced and late-career participants were more strongly represented among teachers, and all administrators came from public-school contexts. Subject areas, school types, and educational levels were also not represented in equal numbers. The data are therefore not suitable for producing separate conclusions for particular subject areas, career stages, or school types. Academicians' different areas of expertise provide system-level diversity but do not imply equal representation of every area of expertise.

A third limitation concerns the data collection method. The online open-ended form allowed participants to respond in their own time and in their own words, but it did not allow the immediate follow-up and probing questions possible in interviews. Some participants provided long and detailed explanations, whereas others gave brief responses. Therefore, a code appearing among fewer participants does not, by itself, indicate that the issue was unimportant to participants. A small proportion of participants knew the researcher beforehand; although most had no such prior relationship, it cannot be completely ruled out that prior acquaintance may have had a limited influence on some responses through social desirability or response style.

The data are based on participants' own written accounts. Participants' evaluations of technological infrastructure, technical support, or school climate were not compared with direct observation, technical failure logs, system-usage data, or internal institutional documents. The divergence between teacher and administrator evaluations of infrastructure underscores this limitation. However, determining which school conditions were objectively "adequate" was outside the scope of the study.

Code frequencies are not, by themselves, measures of the importance of qualitative findings. Because the same participant could contribute to multiple codes and could produce multiple meaningful segments for the same code, segment counts should not be interpreted as quantitative effect sizes. Participant-level *n* and percentage values were used only to describe how visible a particular pattern was within the dataset.

Although each of the teacher, administrator, and academician forms contained seven open-ended questions, the wording, focus, and analytical functions of particular items were not identical. Frequency differences across groups may therefore have been influenced by question structure as well as by stakeholders' professional positions. These differences should not be interpreted as statistical group differences, rankings of importance, or measurements indicating that one group experienced a particular phenomenon more strongly than another.

The findings were evaluated together with direct quotations and the meaning of coded content. Likewise, the risk–resource–context intersections in Table 4.4 indicate that three codes co-occurred within the same participant's response set. Such co-occurrence should not be interpreted as temporal sequence, causal chain, mediation, or moderation effect.

Another limitation is that the entire dataset of 54 participants was coded by the researcher; no independent second coder or inter-coder agreement statistic was used. To strengthen consistency despite this limitation, changes to the codebook were documented, previous cases were revisited when codes were added or refined, and all 54 cases were reviewed again after the final codebook had been established. The resulting audit trail supports transparency and consistency but does not substitute for the value that independent coding might provide in future research. The fact that no new subcode was needed during the final audit refers to a consistency check of the fixed dataset and was not interpreted as evidence that the sample had reached saturation.

Finally, digitalization and especially generative artificial intelligence are changing rapidly. The tools participants use, school policies, and the rules governing AI at the time of data collection may change within a short period. Specific examples of practice may therefore become outdated over time. The relationship among risk, resource, and context identified in this study provides a more general framework, but this framework needs to be re-examined across different periods and technological conditions.

5.6 Recommendations for Future Research

The limitations of this thesis suggest two complementary directions for future research. First, similar studies could include more diverse participant groups from different regions, rural and urban settings, public and private schools, and different educational levels to examine the extent to which the descriptive map based on stakeholder perspectives recurs across contexts. Early-career teachers, teachers in different subject areas, and teachers working in schools with limited technological infrastructure could be more deliberately represented through purposive sampling. This would allow examination of how the risk, protective-resource, and context patterns described in this study converge or diverge across career stages, school types, and local conditions. The second direction requires a separate prospective design intended to track the process of professional resilience directly over time; this recommendation is elaborated below.

Future studies seeking more robust cross-group descriptive comparisons could use common core questions that probe the same concepts for teachers, school administrators, and academicians while adding group-specific questions to this common core. In particular, matching teachers and administrators from the same schools could allow differences in perceptions of infrastructure and support to be examined within the same institutional context. Open-ended survey findings could also serve as a starting point for in-depth interviews or focus-group studies. Issues emerging in this study—such as technostress, communication outside working hours, AI-supported student products, digital ethics, technical support, and administrative fairness—could be examined in greater depth in separate studies. Including the perspectives of students, parents, ICT teachers, and technical personnel could also clarify reciprocal influences within schools.

Unlike the one-time open-ended online-form design used in this thesis, future studies seeking to examine resilience as a process should use a prospective longitudinal design that follows the same teachers through specific digital demands or change events. For example, a baseline measurement could be taken before implementation of a new digital system, platform, or AI policy. Repeated short-

interval data collection could then be conducted during implementation, followed by measures of adaptation/recovery and maintenance of professional functioning.

Repeated interviews or experience diaries could be combined with measures of workload and technology use and with contextual records of support accessed and school conditions. In such a design, the demand or difficulty encountered, resource mobilization, contextual conditions, and subsequent indicators of adaptation/recovery should be defined in advance and tracked over time within the same participant. Unlike the descriptive risk–resource–context co-occurrences identified in this thesis, such a design could allow direct examination of temporal sequence and change within the resilience process.

Intervention studies could test whether practices identified by participants in this study as protective resources or strategies are actually effective. Applied digital-pedagogy training, school-based digital mentoring, rapid technical support, policies concerning communication outside working hours, or professional learning communities could be implemented under different school conditions. Outcomes related to teachers' technostress, perceived workload, well-being, and professional resilience could then be examined using appropriate intervention designs. Such studies could provide stronger evidence about the conditions and teacher groups in which practices identified as useful in this thesis produce measurable differences.

Future studies may use mixed-methods designs to test qualitative patterns in larger samples. Quantitative measures of digital job demands, digital resources, school support, technical-support quality, work-life boundaries, and teacher professional resilience could be examined together, followed by interviews or school cases to explain the meaning of these relationships. Such an approach could, for example, investigate in greater detail whether digital competence functions protectively on its own or through interaction with school support and workload.

Future assessments of technological infrastructure should move beyond the mere presence of devices or internet connectivity. Usability, reliability, equity of access, and technical response time can be treated as separate dimensions. Examining institutional data such as failure logs, the number of support requests, resolution time, or system-use intensity together with teacher and administrator

evaluations could clarify the distinction between a school's technical capacity and the functional capacity teachers experience in everyday work.

The effects of artificial intelligence on teacher professional resilience also require more detailed investigation. Future studies could examine both the possible resource functions of AI—such as facilitating material production, reducing preparation time, and supporting personalization—and its demand functions, such as verifying misinformation, assessing the authenticity of student products, making ethical decisions, and keeping up with new tools. This approach could shift attention from general attitudes toward AI to the mechanisms through which AI affects teachers' work organization and resilience processes.

Finally, profile-based studies could examine risks, protective resources, and contextual factors simultaneously. Teachers may differ not only in terms of high or low resilience but also in the profiles of digital demands they encounter, the personal and social resources available to them, school support, and infrastructure conditions. Identifying such profiles may contribute to the development of needs-sensitive support pathways rather than offering the same intervention to all teachers.

5.7 Conclusion

This study described teachers', school administrators', and academicians' perspectives on risks, protective resources and strategies, and contextual factors associated with teacher professional resilience in the context of digitalization. It also examined shared and divergent emphases across the three stakeholder groups within the same analytical framework. Findings across the three research questions showed that participants did not describe digitalization as a uniformly positive or negative condition. In some accounts, digital tools and practices were associated with continuous adaptation demands, workload, blurred work boundaries, ethical uncertainty, and new pedagogical responsibilities; in others, they were associated with resources that facilitated access to professional learning, instructional materials, information, and social support. These results do not measure levels of

professional resilience or change over time; they describe stakeholder perspectives on factors perceived to be associated with professional resilience.

The integrative interpretation of these descriptive patterns suggests that digital demands should be considered together with the resources available to teachers and the contexts in which they work. Participants identified digital competence, self-directed learning, colleague support, and motivation as resources. Reliable infrastructure, technical support, supportive leadership, workload arrangements, and communication boundaries were also described together with the conditions under which such resources could be used. The study therefore supports examining patterns associated with professional resilience through risks, resources, and contextual conditions together rather than reducing them to individual characteristics alone. However, because the data were collected at a single point in time, they do not demonstrate causal direction among these elements, temporal sequence, or whether a particular resource actually reduces the effect of a particular risk.

Considering teacher, school administrator, and academician perspectives together showed that different professional positions foregrounded different aspects of risk, resource, and context associated with digitalization. Teachers more characteristically emphasized everyday work pressures and classroom usability; administrators emphasized organizational capacity, infrastructure, and support processes; and academicians emphasized research-based and system-level issues such as ethics, policy, competence, professional development, and professional roles.

However, these commonalities and divergences are not statistical group differences. The three groups' question sets are not completely identical, the samples were not matched at the institutional level, and *n*/percentage values indicate only descriptive visibility. Therefore, the greater visibility of inadequate infrastructure among teachers and adequate infrastructure among administrators does not mean that two groups within the same school contradicted one another. Academician perspectives were likewise not used to validate teacher experience.

Considered together, the three groups complement one another by making visible different layers of knowledge at classroom, school, and system/conceptual levels.

In conclusion, the distinctive contribution of this thesis lies in integrating risks, protective resources and strategies, and contextual conditions associated with teacher professional resilience in the context of digitalization rather than treating them as separate lists. The study shows that, under different conditions, the same digital phenomenon may function in participant accounts as a demand, a resource, or a contextual condition shaping these functions.

It also demonstrates, within a single stakeholder-based qualitative synthesis, the different levels at which these domains are understood across the three stakeholder positions.

From a practical perspective, this synthesis suggests that rather than simply encouraging teachers to use more technology, attention should be paid jointly to the manageability of digital demands, accessible technical and pedagogical support, workload and communication boundaries, ethical guidance, and differences in school conditions. These implications, however, are not tested intervention effects, causal mechanisms, or direct evidence of the resilience process over time. Claims about such processes require the prospective longitudinal designs proposed in Section 5.6, which repeatedly follow the same teachers across digital difficulties and resource use.

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APPENDICES

APPENDIX A
Ethics Committee Approval

UYGULAMALI ETİK ARAŞTIRMA MERKEZİ
APPLIED ETHICS RESEARCH CENTER

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Konu : Değerlendirme Sonucu 6.08.2026

Gönderen : ODTÜ İnsan Araştırmaları Etik Kurulu

İlgi : İnsan Araştırmaları Etik Başvurunuz

Sayın Prof. Dr. Ömer Delialioğlu,
Sayın Hüsnü Tolga Gök,

"Dijitalleşme Sürecinde Öğretmenlerin Mesleki Dayanıklılığı: Riskler, Koruyucu Kaynaklar ve Bağlamsal Faktörler (Teacher Professional Resilience in the Process of Digitalization: Risks, Protective Resources, and Contextual Factors)" başlıklı araştırmanız ODTÜ İnsan Araştırmaları Etik Kurulu tarafından uygun görülerek 0373-ODTÜİAEK-2026 protokol numarası ile onaylanmıştır.

Bilgilerinize sunarım.

Prof. Dr. Ş. Halil TURAN
Başkan

Prof. Dr. İ. Semih AKÇOMAK
Üye

Doç. Dr. Ali Emre TURGUT
Üye

Doç. Dr. Aslı KILIÇ ÖZHAN
Üye

Doç. Dr. Çağrı TOPAL
Üye

Doç. Dr. Pınar AYKAÇ LEIDHOLM
Üye

Dr. Öğr. Üyesi Müge GÜNDÜZ
Üye

Middle East Technical University Human Research Ethics Committee approval (Protocol No. 0373-ODTÜİAEK-2026).

Note. The thesis title was revised by the examining committee during the thesis defense.

APPENDIX B

Teacher Data Collection Form

The form was administered in Turkish. The English wording below is provided as a reporting translation for the English-language thesis and preserves the original item order and substantive meaning. Technical export fields (ID and timestamp) are data-management fields and are not reproduced as questionnaire items.

Consent, Demographic, and Professional Items

1. I agree to participate in the study.
2. Current Position
3. Gender
4. Age
5. Highest Level of Education Completed
6. Branch/Subject Area
7. Total Professional Experience (Years)
8. Career Stage
9. Employment Status
10. School Type
11. Educational Level of the School
12. Location of the School
13. Approximate Total Number of Students at Your School
14. Average Class Size You Teach This Term (You may leave this blank if you are an administrator)
15. Additional Duties/Responsibilities Beyond Your Current Position
16. Experience Mentoring/Guiding Newly Appointed Teachers
17. Frequency of Participation in Professional Development/In-Service Training in the Last Two Years
18. Marital Status
19. Whether You Have a Child/Family Member for Whom You Are Responsible
20. Experience Actively Working During Distance/Digital Education
21. Average Weekly Frequency of Information and Communication Technologies (ICT) Use for Professional Purposes

Open-Ended Questions

1. Are there factors that challenge teacher professional resilience? If so, please specify.
2. Are there resources or strategies that support teacher professional resilience? If so, please specify.

3. Is there any situation specific to the school, region, subject area, or educational level in which you work that affects your professional resilience? Please explain.
4. During digitalization (e.g., artificial intelligence, cybersecurity, digital ethics, technostress), which situations you encounter challenge your professional resilience?
5. Which strategies, resources, or supports do you use to cope with situations that challenge your professional resilience during digitalization?
6. How do your institution's technological infrastructure, technical support services, and digital practices affect your process of coping with challenges arising from digitalization?
7. Is there any other opinion, experience, or suggestion you would like to add?

APPENDIX C

School Administrator Data Collection Form

The form was administered in Turkish. The English wording below is provided as a reporting translation for the English-language thesis and preserves the original item order and substantive meaning. Technical export fields (ID and timestamp) are data-management fields and are not reproduced as questionnaire items.

Consent, Demographic, and Professional Items

1. I agree to participate in the study.
2. Current Position
3. Gender
4. Age
5. Highest Level of Education Completed
6. Branch/Subject Area
7. Total Professional Experience (years)
8. Administrative Experience
9. School Type
10. Educational Level of the School
11. Location of the School
12. Approximate Total Number of Students at Your School
13. Experience Mentoring/Guiding Newly Appointed Teachers
14. Frequency of Participation in Professional Development/In-Service Training in the Last Two Years
15. Marital Status
16. Whether You Have a Child/Family Member for Whom You Are Responsible
17. Experience Actively Working During Distance/Digital Education
18. Average Weekly Frequency of Information and Communication Technologies (ICT) Use for Professional Purposes

Open-Ended Questions

1. Are there factors that challenge teacher professional resilience? If so, please specify.
2. Are there resources or strategies that support teacher professional resilience? If so, please specify.
3. Is there any situation specific to your school, region, subject area, or educational level that affects teachers' professional resilience? Please explain.
4. From a school-management perspective, in what ways does digitalization challenge teachers' professional resilience?
5. As school management, what practices do you implement to support teachers' professional resilience during digitalization?

6. How do your school's technological infrastructure, digital resources, and technical support opportunities affect teachers' capacity to cope with challenges arising from digitalization?
7. Is there any other opinion, experience, or suggestion you would like to add?

APPENDIX D

Academician Data Collection Form

The form was administered in Turkish. The English wording below is provided as a reporting translation for the English-language thesis and preserves the original item order and substantive meaning. Technical export fields (ID and timestamp) are data-management fields and are not reproduced as questionnaire items.

Consent, Demographic, and Professional Items

1. I agree to participate in the study.
2. Academic Title
3. Gender
4. Age
5. City
6. Area of Expertise
7. Total Years of Academic Experience
8. Have you conducted academic studies on teacher professional resilience?
9. Have you previously had K–12 teaching experience?

Open-Ended Questions

1. Are there elements you consider missing with respect to risk factors that hinder teacher professional resilience? Please write your suggestions/thoughts.
2. Are there elements you consider missing with respect to protective factors and coping strategies that support teacher professional resilience? Please write your suggestions/thoughts.
3. In the context of teaching in Türkiye (e.g., school type, region, educational level, branch/field, career stage, student profile, crisis/disaster experience, digital/distance education experience, centralized education policies, reform/transition processes, and working conditions), are there elements you consider missing? Please state your suggestions/thoughts.
4. Are the proposed dimensions (Risk, Protective Resource/Strategy, Context) sufficient to explain teacher professional resilience? If you suggest different dimensions, please specify.
5. During digitalization (e.g., artificial intelligence, cybersecurity, digital ethics, technostress), what are the main risks that threaten teachers' professional resilience?
6. During digitalization, which individual, social, and institutional strategies are recommended for strengthening teachers' professional resilience?
7. How does the literature explain the institutional and technological conditions that affect teachers' professional resilience in the face of digitalization-related risks?

APPENDIX E
Hierarchical Code-Subcode Models

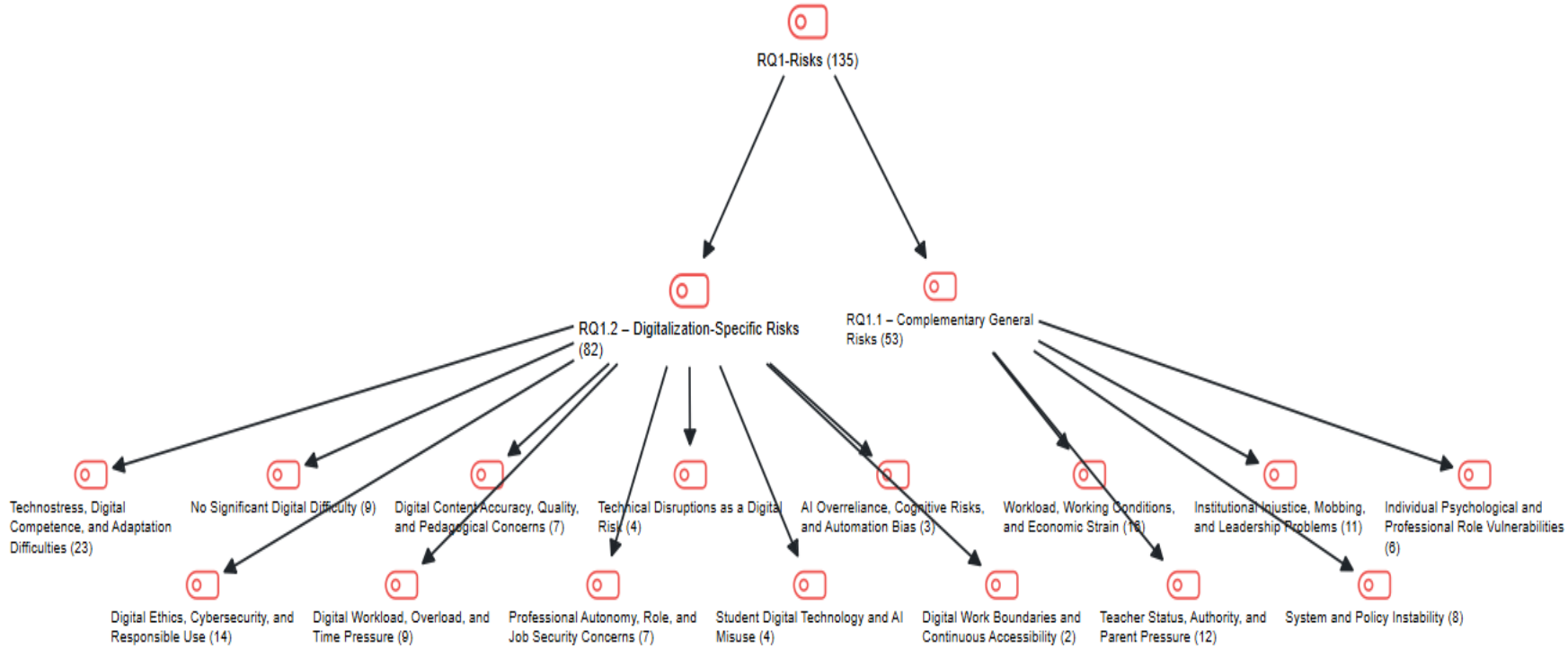

Figure E.1
Hierarchical Code-Subcode Model for RQ1 Risks
Note. Numbers shown in parentheses are coded-segment counts and do not represent participant-level prevalence.

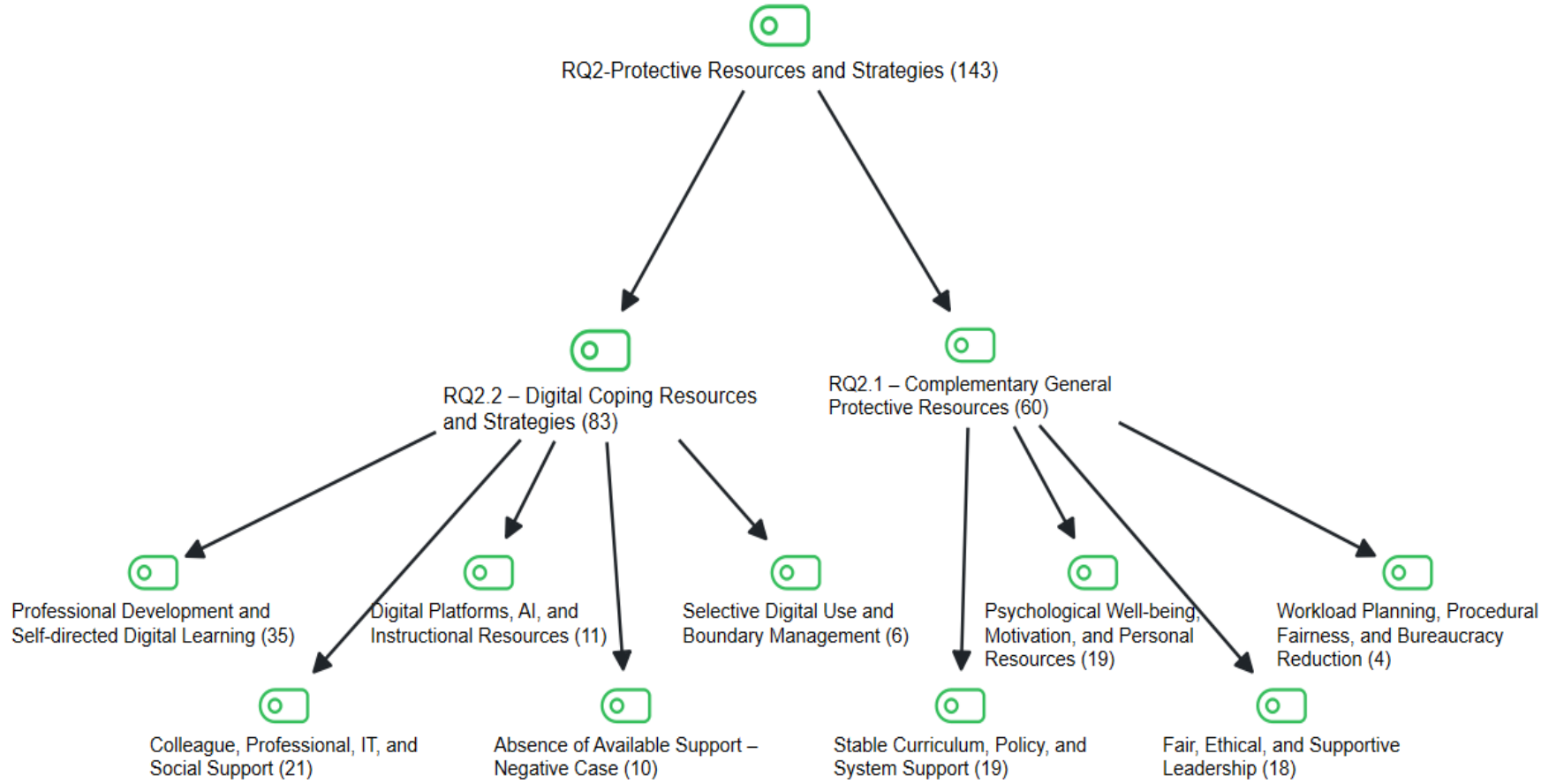

Figure E.2

Hierarchical Code-Subcode Model for RQ2 Protective Resources and Strategies

Note. Numbers shown in parentheses are coded-segment counts and do not represent participant-level prevalence.

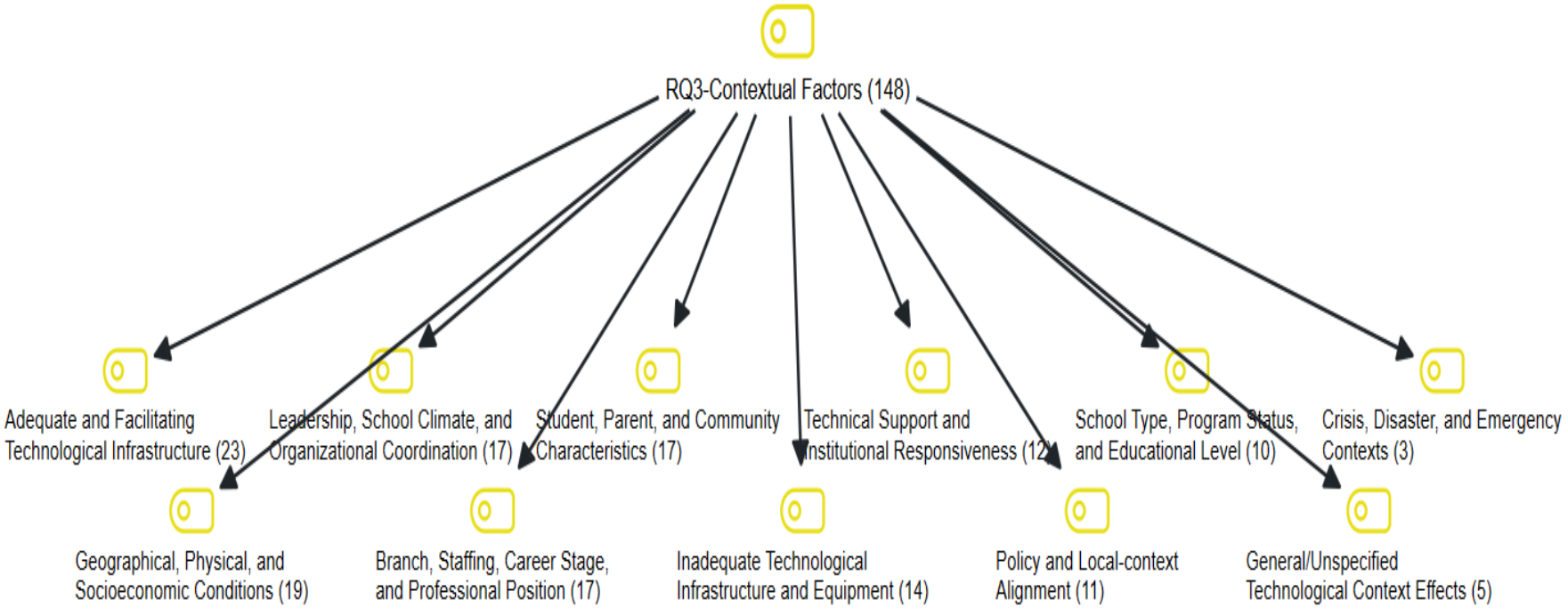

Figure E.3
Hierarchical Code-Subcode Model for RQ3 Contextual Factors
Note. Numbers shown in parentheses are coded-segment counts and do not represent participant-level prevalence.

APPENDIX F

Final Analytical Codebook

This appendix presents the complete 35-code analytical codebook used in the final empirical analysis. Each entry specifies the operational definition applied in coding, the inclusion and exclusion criteria used to distinguish conceptually adjacent codes, and one illustrative coded segment from the final dataset. The examples are English reporting translations of actual coded segments; participant identifiers use stakeholder prefixes followed by anonymized case numbers (T = teacher, SA = school administrator, AC = academician; e.g., T19). These prefixes identify the source participant and are not analytic codes.

The exclusion criteria make code boundaries explicit but do not prohibit justified co-coding. A single meaning unit could receive more than one code when it expressed analytically distinct functions or mechanisms. For example, the same statement could identify a direct risk and, at the same time, a contextual condition. In such cases each assignment was retained only when the corresponding analytic meaning was present.

Examples are included to demonstrate code application rather than to indicate frequency, importance, or statistical representativeness.

Table F.1

Final Codebook for RQ1 Complementary General Risks

Code	Definition	Inclusion / Exclusion Criteria	Illustrative Coded Segment (English translation)
Individual Psychological and Professional Role Vulnerabilities	Individual psychological, social, physiological, or professional-role vulnerabilities that may make coping with occupational demands more difficult.	**Include:** Perfectionism; emotion-regulation difficulty; motivation loss; work–life imbalance; role/responsibility ambiguity; personal belief–practice conflict. **Exclude:** Institutional injustice or mobbing; workload/economic strain; digital competence or adaptation problems when the difficulty is specifically technology-related.	"Perfectionism, difficulties in emotion regulation, and ambiguity in roles and responsibilities." (AC7)
Institutional Injustice, Mobbing, and Leadership Problems	Experienced unfairness, hostile or arbitrary management, mobbing, favoritism, or other leadership practices described as threats to professional resilience.	**Include:** Mobbing; arbitrary administrative practices; favoritism; unfair schedules; politically biased treatment; lack of recognition when framed as injustice. **Exclude:** Supportive/fair leadership as a protective resource; leadership style or school climate as a contextual condition unless the statement describes an experienced risk.	"Mobbing, injustice in the institution, unfair lesson schedules, and gossip." (T19)
Workload, Working Conditions, and Economic Strain	General occupational burden arising from workload, bureaucratic duties, difficult working conditions, or financial/economic pressures not limited to digitalization.	**Include:** Paperwork; excessive duties; salary/financial strain; long or uninterrupted work; transport/housing burden; pressure to complete curriculum or meet performance demands. **Exclude:** Digitally generated workload/time pressure; after-hours digital accessibility; geographical or physical conditions when described only as background context rather than experienced burden.	"Endless administrative paperwork and burdensome responsibilities take a lot of time." (SA16)
Teacher Status, Authority, and Parent Pressure	Threats linked to diminished teacher status or authority and direct pressure, interference, aggression, or excessive demands from parents or students.	**Include:** Loss of prestige; weakened disciplinary authority; parental interference; demands for constant access; attacks or aggressive behavior toward teachers. **Exclude:** Student/parent/community characteristics when described as contextual background rather than direct pressure; digital-boundary violations when the primary meaning is continuous online accessibility.	"The decline in teachers' prestige and excessive parental interference with teachers." (T4)
System and Policy Instability	Uncertainty and strain created by frequent, rapid, unclear, or unpredictable changes in the education system, curriculum, legislation, or policy environment.	**Include:** Frequent curriculum changes; unstable regulations; rapid reforms without piloting; perceived uncertainty about what may change next. **Exclude:** Stable policy/system support as a resource; policy–local-context fit or implementation alignment as a contextual factor.	"Very frequent and rapid changes are made in the education system, without piloting them first or obtaining teachers' views." (AC4)

Table F.2

Final Codebook for RQ1 Digitalization-Specific Risks (Part I)

Code	Definition	Inclusion / Exclusion Criteria	Illustrative Coded Segment (English translation)
Technostress, Digital Competence, and Adaptation Difficulties	Stress, perceived inadequacy, or adaptation difficulty arising from digital change, required digital competence, and the need to keep up with evolving technologies.	**Include:** Technostress; lack of technology knowledge; weak digital skills; difficulty adapting to new systems; self-doubt during sudden digital transitions; continuous updating demands. **Exclude:** Acute technical failures; lack of infrastructure/equipment; digital workload/time pressure when competence or adaptation is not the primary issue.	"Not being able to keep up with change." (AC2)
Digital Workload, Overload, and Time Pressure	Additional workload, accelerated task expectations, monitoring demands, or time pressure generated by digital systems and digitalized work processes.	**Include:** Extra data entry; rapidly changing systems that require additional time; AI increasing rather than reducing work; faster document demands; digital task overload. **Exclude:** General non-digital workload; after-hours intrusion and continuous availability when the core issue is boundary erosion.	"Increased workload and time pressure." (SA2)
Digital Work Boundaries and Continuous Accessibility	Erosion of work–life boundaries when digital communication or systems make teachers continuously reachable beyond normal working time.	**Include:** Evening/weekend messaging; expectation of constant availability; parent messaging at any hour; work communication intruding into private life. **Exclude:** Digital overload without a boundary/accessibility component; general parent pressure not specifically mediated through continuous digital access.	"Some parents want to be able to reach the teacher at any hour." (T2)
Technical Disruptions as a Digital Risk	Immediate disruptions in the functioning of digital tools or connectivity that interrupt teaching or other professional activity.	**Include:** Internet interruptions during use; device or platform malfunction; inability to access digital content during an activity; technical problems that interrupt instruction. **Exclude:** Persistent lack of infrastructure/equipment as a contextual condition; general negative technological effects without a specified disruption.	"Experiencing technical problems with digital tools." (T16)
Professional Autonomy, Role, and Job Security Concerns	Concerns that digitalization or AI may reduce professional autonomy, blur teachers' responsibilities or identity, or threaten the continuity/security of the teaching role.	**Include:** Fear of losing the profession; reduced autonomy; loss of control over work; uncertainty about AI-related roles and responsibilities; tension around professional identity online. **Exclude:** General policy instability; lack of competence or adaptation; workload increases without a role/autonomy dimension.	"Concern that they may lose their profession or that their autonomy may decrease." (AC14)

Table F.3

Final Codebook for RQ1 Digitalization-Specific Risks (Part II)

Code	Definition	Inclusion / Exclusion Criteria	Illustrative Coded Segment (English translation)
AI Overreliance, Cognitive Risks, and Automation Bias	Cognitive and professional risks associated with excessive reliance on AI or automated systems and reduced independent judgment or reasoning.	**Include:** Overreliance; cognitive offloading; automation bias; dependence on AI-generated output; diminished independent thinking attributable to automation. **Exclude:** Incorrect or low-quality digital content when the issue is output accuracy/pedagogy; student misuse when the focus is behavior rather than cognitive dependence.	"Cognitive offloading, overreliance, and automation bias are among the main cognitive risks." (AC4)
Digital Content Accuracy, Quality, and Pedagogical Concerns	Concerns about the accuracy, reliability, educational quality, or pedagogical appropriateness of digital or AI-generated content and outputs.	**Include:** Difficulty judging accuracy; AI misleading teachers; performance gains that do not represent meaningful learning; poor-quality digital content; pedagogy weakened by digital output. **Exclude:** Copyright, privacy, cybersecurity, or legal/ethical issues; excessive dependence on AI when accuracy/quality is not the main concern.	"Rapid access to information also carries risks concerning the accuracy of information." (AC11)
No Significant Digital Difficulty	Negative/deviant-case code for explicit statements that digitalization did not create a meaningful difficulty or was experienced as facilitating rather than problematic.	**Include:** No difficulty; no serious problem; active/easy use; statements that digitalization facilitates work rather than challenges it. **Exclude:** Blank, placeholder, or uninterpretable responses; statements that contain an identifiable digital difficulty.	"I did not experience difficulty during digitalization. I use it actively." (T4)
Student Digital Technology and AI Misuse	Problematic or inappropriate student use of digital technologies or AI that is described as undermining learning, authenticity, classroom processes, or professional work.	**Include:** AI-generated assignments submitted as students' own work; problematic phone use; entertainment-focused technology use; student-originated cyber or online misuse. **Exclude:** General digital ethics/cybersecurity concerns not tied to student misuse; inaccurate AI content when the issue is content quality rather than student behavior.	"Assignments I gave to support children's language development were prepared directly using ChatGPT." (T7)
Digital Ethics, Cybersecurity, and Responsible Use	Ethical, legal, privacy, security, copyright, online-reputation, and responsible-use risks associated with digital technologies and AI.	**Include:** Data/privacy security; cybersecurity; copyright/intellectual-property concerns; plagiarism; cyberbullying; online reputation; absence of clear ethical/legal regulation. **Exclude:** Content accuracy or pedagogical quality without an ethical/security dimension; student misuse unless an explicit ethical, security, or responsible-use issue is present.	"Concerns about copyright and intellectual-property violations." (AC7)

Table F.4

Final Codebook for RQ2 Complementary General Protective Resources

Code	Definition	Inclusion / Exclusion Criteria	Illustrative Coded Segment (English translation)
Fair, Ethical, and Supportive Leadership	Leadership behaviors and administrative practices that provide fairness, recognition, trust, communication, and active support to teachers.	**Include:** Fair treatment; recognition and rewards; supportive communication; ethical leadership; responsiveness to teachers' psychological/professional needs. **Exclude:** Leadership/school climate as a contextual condition when no protective action/resource is specified; injustice, mobbing, or arbitrary leadership as a risk.	"Fair behavior by administrators." (AC12)
Workload Planning, Procedural Fairness, and Bureaucracy Reduction	Organizational strategies that reduce avoidable workload and bureaucracy or distribute tasks through transparent, planned, and fair procedures.	**Include:** Planning workload across the year; reducing paperwork; common templates; transparent/fair scheduling; automation used to improve procedural fairness. **Exclude:** General policy stability; selective digital-use boundaries; workload itself when described as a risk rather than a protective organizational response.	"Distributing the workload across the teaching process and planning tasks at the beginning of the year." (T11)
Psychological Well-being, Motivation, and Personal Resources	Individual psychological and motivational capacities or practices described as helping teachers sustain professional functioning and cope with demands.	**Include:** Emotion regulation; problem solving; motivation; professional commitment; self-efficacy; personal boundary-setting; capacity to generate multiple coping strategies. **Exclude:** Formal professional development/digital learning; technology-specific boundary management; external social or institutional support.	"Development of emotion-regulation skills." (AC13)
Stable Curriculum, Policy, and System Support	Formal, predictable, and supportive policies, regulations, system structures, or institutional guidelines that provide continuity and support for teachers.	**Include:** Clear/applicable guidelines; supportive school policies; formal ministry/system support; stable career or regulatory structures; policies addressing digital risks. **Exclude:** Policy–local-context fit as a contextual condition; school-level supportive leadership; instability or uncertainty in policy as a risk.	"Clear and applicable artificial-intelligence guidelines." (AC17)

Table F.5

Final Codebook for RQ2 Digital Coping Resources and Strategies

Code	Definition	Inclusion / Exclusion Criteria	Illustrative Coded Segment (English translation)
Professional Development and Self-directed Digital Learning	Formal or self-directed learning activities that build digital, pedagogical, ethical, or related professional capacities for coping with digital change.	**Include:** In-service training; digital literacy training; self-development; learning new tools; online courses; professional projects/communities when the emphasis is learning and skill development. **Exclude:** Access to tools/platforms without a learning component; general motivation/personal resources; technical help that solves an immediate problem.	"Examining new educational models, participating in online training, and attending in-service training where innovations can be experienced face-to-face." (T12)
Selective Digital Use and Boundary Management	Deliberate strategies that limit, balance, or purposefully structure technology use in order to reduce overload, dependence, or boundary erosion.	**Include:** Purposeful/minimal use; digital boundaries; technology-free time; limiting non-urgent after-hours messaging; balancing digital and non-digital activities. **Exclude:** Digital boundary erosion described as a risk; general personal boundary-setting without a technology-use strategy.	"Using technology purposefully and in a balanced way, setting digital boundaries, and creating technology-free times." (AC4)
Digital Platforms, AI, and Instructional Resources	Digital tools, AI applications, platforms, and technology-supported instructional materials used or proposed as resources that facilitate teaching and professional work.	**Include:** AI support; digital teaching platforms; Education Information Network (EBA) / Teacher Information Network (ÖBA); smartboard-supported resources; paid applications; digital materials that diversify teaching or improve flexibility. Exclude: Physical/connectivity infrastructure as context; training to learn the tool; technical support personnel; inaccurate/low-quality digital content as a risk.	"Adequate digital resources diversify learning materials and provide pedagogical flexibility." (SA2)
Absence of Available Support – Negative Case	Negative/deviant-case code for explicit statements that needed professional, institutional, psychological, training, or other support was unavailable or insufficient.	**Include:** No support found; no additional support practice; inadequate counseling; insufficient guidance or in-service training; lack of family/institutional support. **Exclude:** Inadequate technological infrastructure without a support component; statements describing available colleague, IT, or professional support.	"I could not find any support at all during that period." (T2)
Colleague, Professional, IT, and Social Support	Interpersonal or professional support from colleagues, IT staff, experts, family/social networks, unions, or professional communities used to cope with challenges.	**Include:** Peer consultation; IT-teacher help; expert/psychological support; professional learning communities; family/social support; union support; collaborative exchange. **Exclude:** School leadership support when the administrator's leadership behavior is central; technical-support responsiveness as an organizational contextual condition rather than a coping resource.	"I consult colleagues who are knowledgeable." (T14)

Table F.6

Final Codebook for RQ3 Contextual Factors (Part I)

Code	Definition	Inclusion / Exclusion Criteria	Illustrative Coded Segment (English translation)
School Type, Program Status, and Educational Level	Institutional characteristics related to school type, program/status, or educational level that shape teachers' working and digitalization context.	**Include:** Public/private school context; preschool/primary/secondary/vocational level; project-school status; combined classes; level-specific institutional differences. **Exclude:** Subject branch, staffing status, or career stage; physical or technological conditions when those are the primary contextual feature.	"I think school type can affect professional resilience." (SA2)
Branch, Staffing, Career Stage, and Professional Position	Contextual differences linked to subject branch, staffing/employment status, appointment or mobility processes, career stage, and professional position.	**Include:** Out-of-field assignment; contract/paid employment; compulsory service; transfers; career steps; staffing/norm processes; branch-specific positioning. **Exclude:** School type/educational level; general policy instability; job-security anxiety when framed primarily as a digitalization-related risk rather than a contextual employment condition.	"Out-of-field assignment, paid or contract employment, compulsory service, and frequent relocation." (AC7)
Technical Support and Institutional Responsiveness	The availability, accessibility, speed, and problem-solving responsiveness of technical or institutional support within the work environment.	**Include:** Accessible technical personnel; rapid troubleshooting; institutional responsiveness to digital problems; facilitating conditions that make support available when needed. **Exclude:** Colleague/professional/IT support when framed as a coping resource used by the teacher; adequacy of devices/connectivity themselves.	"Continuously accessible technical support helps teachers solve the problems they encounter quickly." (SA2)
Student, Parent, and Community Characteristics	Characteristics, expectations, behaviors, and social/cultural conditions of students, parents, and the surrounding community that shape teachers' professional experience.	**Include:** Student motivation/profile; parental attitudes or intervention; family economic characteristics; multicultural/community context; expectations placed on teachers by families. **Exclude:** Direct parental pressure/status erosion when coded as an experienced risk; broader geographical/physical/socioeconomic conditions not centered on students/parents/community actors.	"When parents treat AI as an adviser or expect teachers to filter every piece of information like a computer engineer, this can create unwarranted pressure on teachers and school administration." (AC14)

Table F.7

Final Codebook for RQ3 Contextual Factors (Part II)

Code	Definition	Inclusion / Exclusion Criteria	Illustrative Coded Segment (English translation)
Geographical, Physical, and Socioeconomic Conditions	Broader geographical location, physical environment, access conditions, and socioeconomic circumstances that shape teachers' work and resilience context.	**Include:** Rural location; transport and distance; school physical facilities; class/school size; local socioeconomic conditions; inability to meet basic physical needs. **Exclude:** Technology-specific infrastructure/equipment; student/parent characteristics when the social actor rather than the broader environment is the primary contextual feature.	"When schools' physical facilities are limited and teachers' basic needs cannot be met, this can affect their well-being and resilience in a chain." (AC16)
Inadequate Technological Infrastructure and Equipment	Insufficient or inaccessible technological infrastructure, connectivity, devices, or equipment that constrain teachers' ability to use digital resources reliably.	**Include:** Missing/insufficient computers or smartboards; lack of internet access; unequal access to digital materials; equipment shortages; unreliable infrastructure availability. **Exclude:** Temporary technical malfunction coded as an acute digital risk; availability/speed of technical support; vague negative technology effects with insufficient detail.	"Not providing smartboards to preschool classrooms prevents my students from participating actively in digital-content activities." (T4)
Adequate and Facilitating Technological Infrastructure	Sufficient, reliable, and accessible technological infrastructure and equipment that enable uninterrupted digital work and facilitate teaching.	**Include:** Reliable internet; functioning devices/smartboards; adequate infrastructure; equitable access to infrastructure; infrastructure that reduces interruption or enables digital tools. **Exclude:** Digital platforms/content as instructional resources; technical personnel/support responsiveness; vague positive technology effects without enough detail.	"Strong infrastructure support enables teachers to use digital tools without interruption." (SA2)
Crisis, Disaster, and Emergency Contexts	Crisis, disaster, pandemic, or emergency situations that alter working conditions and intensify or expose digital adaptation and resilience demands.	**Include:** COVID-19 and sudden remote-education transitions; disaster-management contexts; global crises or emergencies that change institutional/digital demands. **Exclude:** Routine policy/system instability; ordinary technological change without a crisis/emergency context.	"During sudden transition processes, teachers question their own competence, which indirectly affects their professional resilience." (AC11)

Table F.8

Final Codebook for RQ3 Contextual Factors (Part III)

Code	Definition	Inclusion / Exclusion Criteria	Illustrative Coded Segment (English translation)
Policy and Local-context Alignment	The degree to which policies, curricula, regulations, and system expectations fit, can be interpreted within, or respond to local school and learner realities.	**Include:** Mismatch between curriculum/model and exam expectations; difficulty making sense of policy; need to adapt policy to local needs; regulations that do not fit school realities. **Exclude:** Frequent/unstable policy change as a risk; stable formal policy support as a protective resource.	"The expectations of the curriculum model and the expectations of the examination system do not align." (AC4)
General/Unspecified Technological Context Effects	Residual contextual code for statements indicating a positive or negative technological effect without enough detail to assign a more specific infrastructure, support, or resource code.	**Include:** Brief statements such as "negative," "insufficient," or "makes it harder" when the technological context is clear but the mechanism is not specified. **Exclude:** Statements that provide enough detail for inadequate/adequate infrastructure, technical support, digital resources, or another more specific contextual code.	"Negative." (T1)
Leadership, School Climate, and Organizational Coordination	School-level leadership style, organizational climate, participation, coordination, and relational functioning that shape the environment in which teachers experience digitalization and professional demands.	**Include:** Democratic/authoritarian management style; school climate; participation in decisions; belonging; coordination among departments/teams; leadership as an organizational condition. **Exclude:** Fair/supportive leadership when framed as a protective resource or action; mobbing, favoritism, or arbitrary leadership when framed as an experienced risk.	"Administrators' management styles are very important because they affect the entire school climate." (AC4)

APPENDIX G

Empirical Dataset (54 Participants): Coding Interface Screenshots

This appendix documents the coding interface outputs for the final 54-participant empirical dataset analyzed in the thesis (19 teachers, 17 school administrators, and 18 academicians). These screenshots are not outputs from the 254-study conceptual literature corpus. The literature-corpus screenshots are presented separately in Appendix I, while Appendix H contains the stakeholder all-code distribution visuals between the two screenshot appendices. Counts displayed in the interface are coded-segment counts unless otherwise specified; they should not be interpreted as participant-level prevalence.

Figure G.1

Top-Level Coding Output for the 54-Participant Empirical Dataset

Note. The three parent nodes contain 135 RQ1 risk segments, 143 RQ2 protective-resource/strategy segments, and 148 RQ3 contextual-factor segments, for 426 coded segments in total. These are segment counts, not participant counts.

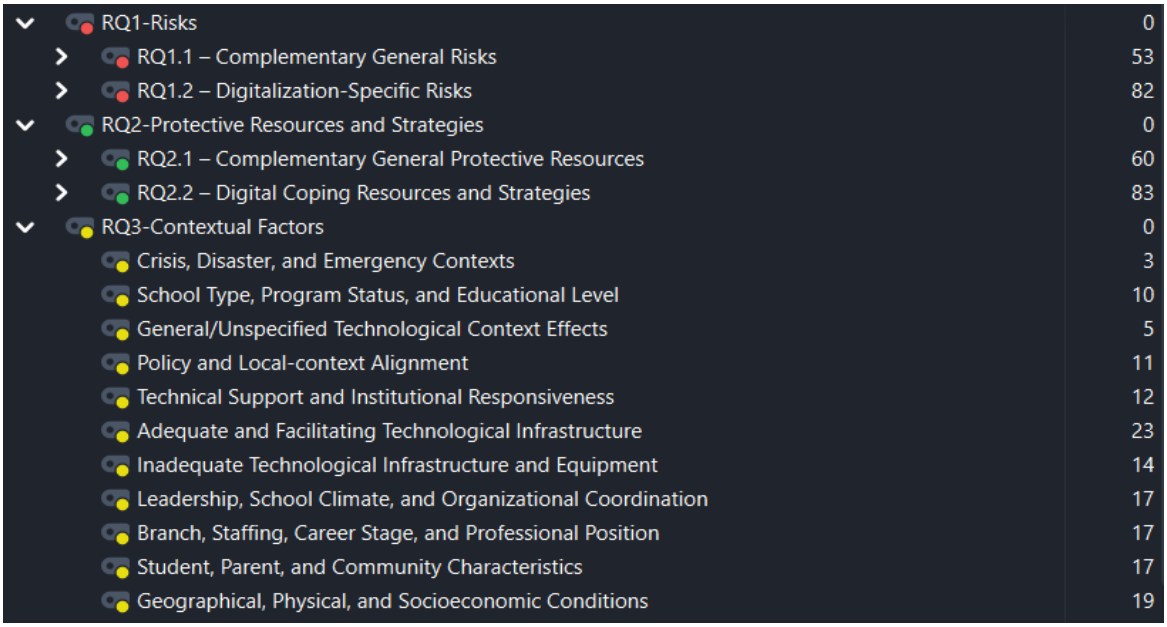

Figure G.2

Hierarchical Coding Interface Overview for the 54-Participant Empirical Dataset

Note. This screenshot shows the final empirical hierarchy across the three research-question domains. The interface belongs only to the 54-participant dataset and is separate from the 254-study literature corpus.

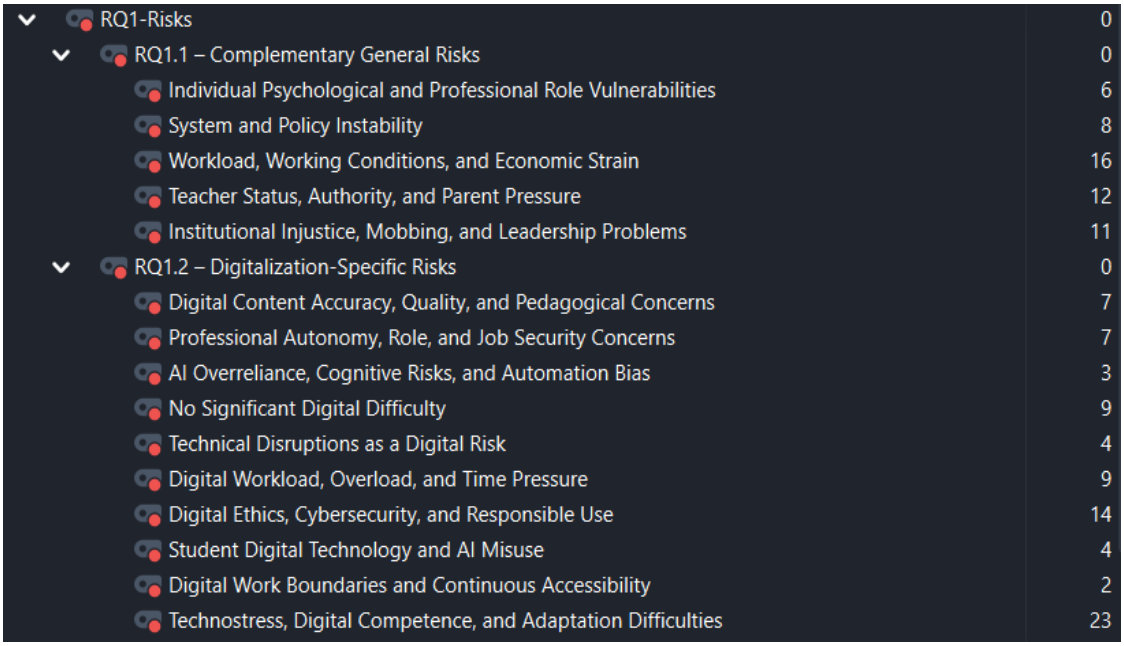

Figure G.3

RQ1 Risk Subcodes in the 54-Participant Empirical Dataset

Note. The displayed values are coded-segment counts within the final empirical RQ1 coding structure; participant-level prevalence is reported separately in the findings tables.

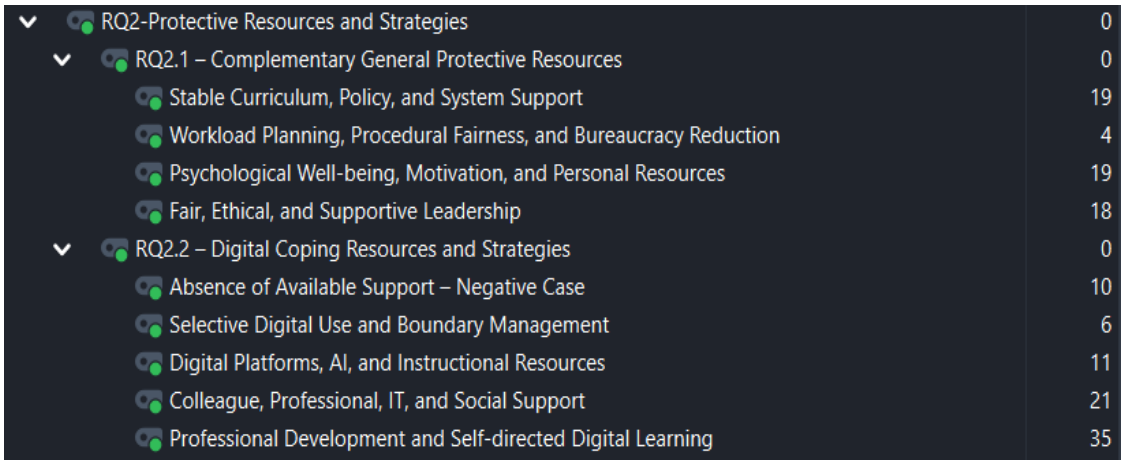

Figure G.4

RQ2 Protective Resource and Strategy Subcodes in the 54-Participant Empirical Dataset

Note. The displayed values are coded-segment counts within the final empirical RQ2 coding structure; participant-level prevalence is reported separately in the findings tables.

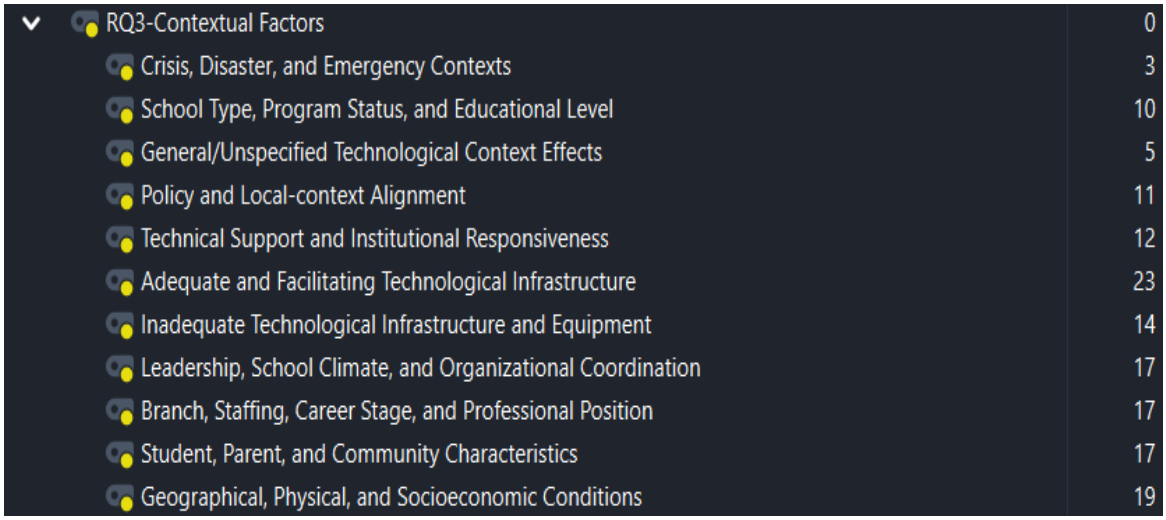

Figure G.5

RQ3 Contextual Factor Subcodes in the 54-Participant Empirical Dataset

Note. The displayed values are coded-segment counts within the final empirical RQ3 coding structure; participant-level prevalence is reported separately in the findings tables.

APPENDIX H

Stakeholder All-Code Distribution Visuals

The following figures reconstruct the stakeholder-specific all-code distribution logic used during defense preparation, using the final binary participant-code matrix rather than presentation screenshots. Each figure shows participant-level prevalence across all 35 leaf codes for one stakeholder group. Codes are labeled by research question and ordered by prevalence within the displayed stakeholder group.

These visuals are descriptive summaries. They should not be read as rankings of substantive importance or as evidence of statistically significant stakeholder differences. The three stakeholder forms contained seven open-ended questions each, but their wording and professional focus were not completely identical.

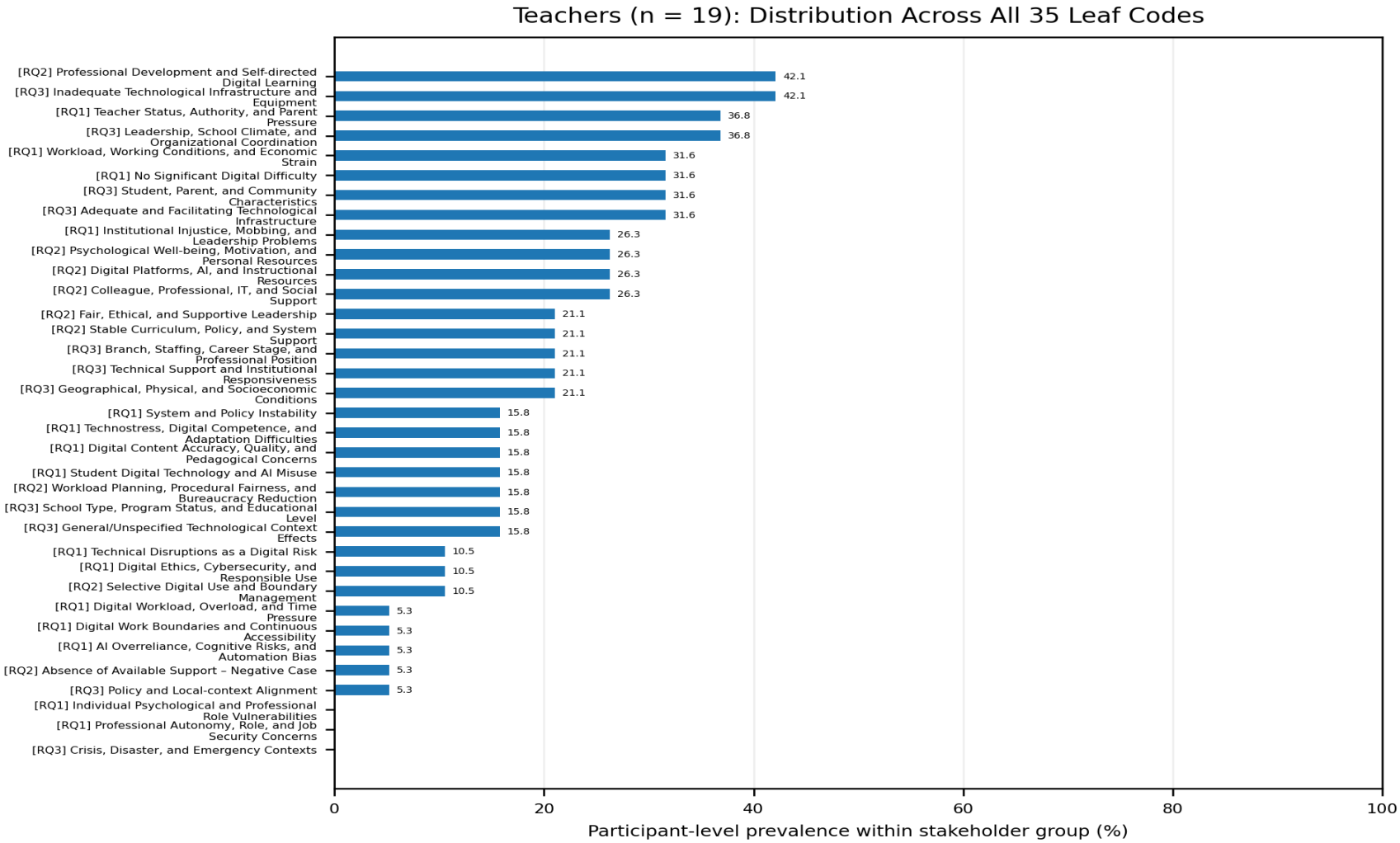

Figure H.1

Teacher Distribution Across All 35 Leaf Codes

Note. Percentages use teachers n = 19. Values indicate the proportion of teachers whose responses contained each code at least once.

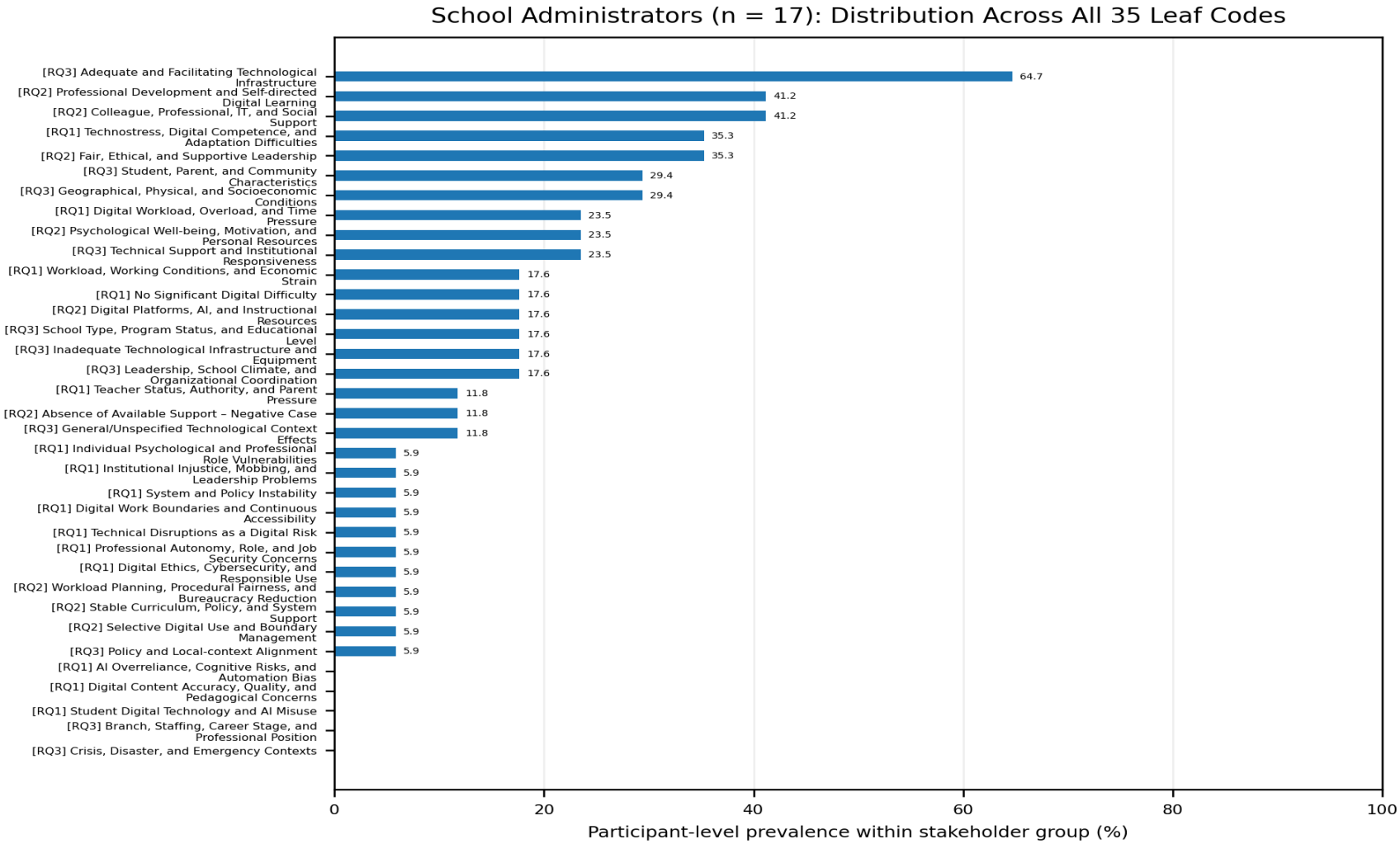

Figure H.2

School Administrator Distribution Across All 35 Leaf Codes

Note. Percentages use school administrators n = 17. Values indicate the proportion of school administrators whose responses contained each code at least once.

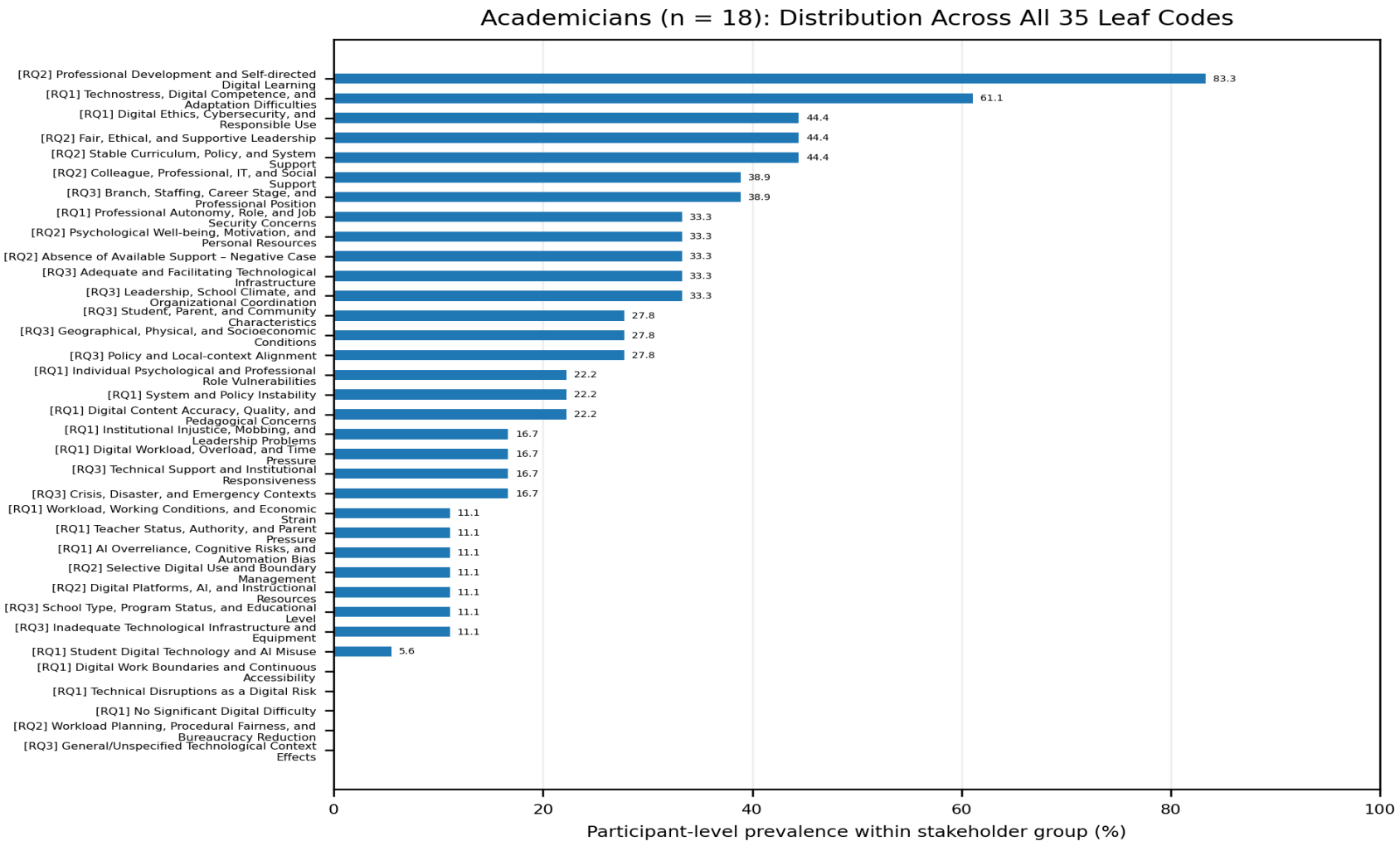

Figure H.3

Academician Distribution Across All 35 Leaf Codes

Note. Percentages use academicians n = 18. Values indicate the proportion of academicians whose responses contained each code at least once.

APPENDIX I

Conceptual Literature Corpus (254 Studies): Coding Interface Screenshots

This appendix documents only the 254-study conceptual literature corpus used for conceptual synthesis, question development, and the initial analytical orientation. The interface label "250+ Literature" is an internal workspace label used to distinguish the literature-corpus coding workspace from the participant-data workspace; the final conceptual literature corpus contains 254 studies. The screenshots below are not outputs from the 54-participant empirical dataset. Empirical participant-data interface screenshots are provided separately in Appendix G, with Appendix H placed between the two screenshot appendices to keep the two data sources visually distinct.

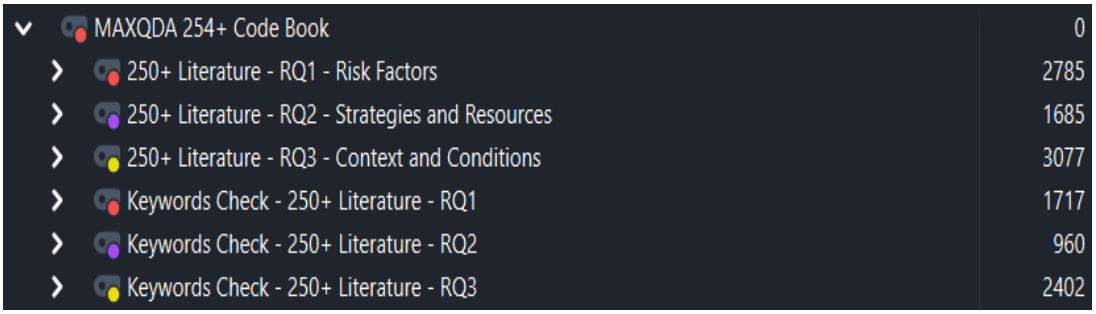

Figure I.1

Top-Level Coding Interface Overview for the 254-Study Conceptual Literature Corpus

Note. This screenshot pertains only to the 254-study conceptual literature corpus and not to the 54-participant empirical dataset.

Figure I.2

RQ1 Risk-Factor Subcodes in the 254-Study Conceptual Literature Corpus

Note. This screenshot pertains only to the 254-study conceptual literature corpus and not to the 54-participant empirical dataset.

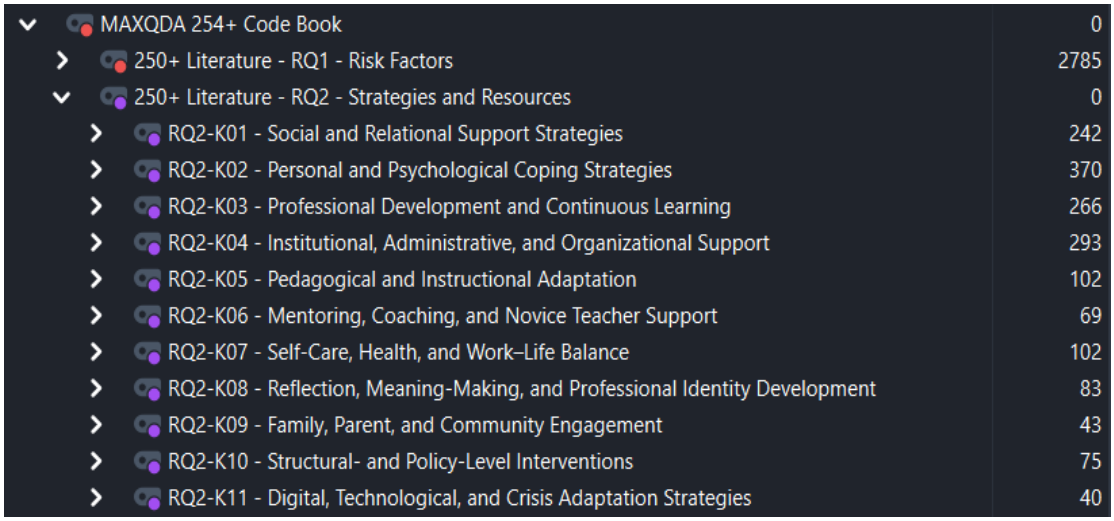

Figure I.3

RQ2 Strategy-and-Resource Subcodes in the 254-Study Conceptual Literature Corpus

Note. This screenshot pertains only to the 254-study conceptual literature corpus and not to the 54-participant empirical dataset.

Figure I.4

RQ3 Context-and-Condition Subcodes in the 254-Study Conceptual Literature Corpus

Note. This screenshot pertains only to the 254-study conceptual literature corpus and not to the 54-participant empirical dataset.