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COORDINATION DYNAMICS IN DIGITAL AND AI EDUCATION GOVERNANCE IN CHILE

**A mixed-methods parallel convergent study of stakeholder's
perceptions**

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I will not let that fire in my chest cease to burn.

List of abbreviations

Abbreviation	Full term
AI	Artificial Intelligence
CEPAL	Comisión Económica para América Latina y el Caribe (Economic Commission for Latin America and the Caribbean)
CORFO	Corporación de Fomento de la Producción (Chilean Production Development Corporation)
COVID-19	Coronavirus Disease 2019
D1–D5	The five coordination dimensions (D1: shared understanding; D2: role clarity; D3: coordination mechanisms; D4: multi-level and D5: cross-sector coordination; uncertainty management)
DK/NA	Don't Know / Not Applicable
EdTech	Educational Technology
GEM	Global Education Monitoring (Report)
ICT	Information and Communication Technology(ies)
IQR	Interquartile Range
MINEDUC	Ministerio de Educación de Chile (Chilean Ministry of Education)
MLG	Multi-Level Governance
OECD	Organisation for Economic Co-operation and Development
OLPC	One Laptop per Child
PME	Plan de Mejoramiento Educativo (School Improvement Plan)
RQ	Research Question

RTA	Reflexive Thematic Analysis
SD	Standard Deviation
SENCE	Servicio Nacional de Capacitación y Empleo (National Training and Employment Service)
SEP	Subvención Escolar Preferencial (Preferential School Subsidy)
SUBTEL	Subsecretaría de Telecomunicaciones (Undersecretariat of Telecommunications)
TVET	Technical and Vocational Education and Training
UNESCO	United Nations Educational, Scientific and Cultural Organization

Abstract

Digital and artificial-intelligence (AI) transformation has reframed educational technology as a problem of governance. For Chile, it has become a development problem concerning human-capital formation, competitiveness and the capacity to steer sociotechnical change equitably. Chile's market-oriented school system governs digital education through a heterarchical network, where coordination capacity is visibly active, but it remains unclear whether digital initiatives become sustainable capabilities of its education system.

This thesis asks how key stakeholders perceive coordination capacity in Chile's digital and AI education governance, and what enacted coordination dynamics reveal about the governance configuration of Chile's digital and AI education system. The study uses a convergent parallel mixed-methods design, integrating through a joint display, an elite survey of 58 respondents with 17 semi-structured interviews involving 18 participants, structured around five dimensions of coordination capacity, which are based in governance-as-coordination literature.

The findings show coordination as active, plural and weakly cumulative. It is dense on an operational plane of mechanisms, relationships and continuity efforts, weak but convergent on a cognitive plane of shared meaning and role recognition, and not significantly associated between the two. The thesis reads this configuration as a heterarchy without a strategic anchor: a field that performs coordination while lacking the institutional location where dispersed activity becomes shared direction. Its articulating function has partly shifted toward private and intermediary actors, resting on individual leadership efforts, while the concept of coordination itself operates as a polysemic boundary object.

The thesis contributes a two-plane reading of coordination capacity and a perception-based design for studying it. It argues that Chile's central institutional task is to locate the function through which coordination becomes cumulative, with implications for whether digital and AI transformation narrows or deepens educational inequality. On this account, the state has reconfigured rather than retreated: present operationally, but weak where strategic direction is set.

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1. Introduction

Over the past decade, digital and artificial-intelligence (AI) technologies have become a protagonist in education policy debates, moving from questions of access and infrastructure toward questions of governance, system capacity and institutional coherence (UNESCO, 2024; Selwyn, 2016). The issue is no longer whether schools adopt technological tools, as the rapid digital transformation has shifted the way in which technology enters the education system. Now, the question is how a public education system steers a transformation that redistributes roles, authority and dependence across a plural ecosystem of education provision.

For Chile, this is a developmental question as well. Digital and AI transformation is usually discussed in two ways. One is about human capital, competitiveness and economic growth. From this view, education is expected to prepare skills, support innovation and help the country take part in wider processes of productive transformation. Structural transformation literature shows that these processes require coordination, learning and institutional capacity that markets do not provide on their own (Juhász, Lane and Rodrik, 2024). The other way is humanistic. Digital transformation also raises questions of equity, data, agency and human dignity, which connect with human-development approaches to education and technology (Kleine, 2010). Although these visions are usually competing, in this thesis, both meet on the need of digital transformation requiring a more anticipatory public role.

This is difficult in Chile because the school system is already organised through distributed authority. Chile's education system has been shaped by vouchers, school choice, private provision and a subsidiary state, with responsibility spread across public and private actors (Bellei, 2015; Parcerisa and Falabella, 2017). Digital education entered this market-oriented architecture, and its governance now involves ministries, public agencies, schools, EdTech firms, foundations and international organisations. Recent work describes this as a heterarchical network in which the state operates as one actor among many (Villalobos et al., 2024). In multi-level governance (MLG) fields, governing depends heavily on coordination,

the alignment of interdependent actors when no single actor controls the whole (Benz, 2019; Altrichter, 2010).

The central issue is whether coordination dynamics become system-level capacity. Chile's digital education field is visibly active. Working groups meet, frameworks are produced, platforms circulate, public and private actors collaborate, and international organisations support policy processes. Activity, however, does not automatically become shared direction. Coordination can operate through mechanisms without becoming a stable governance arrangement or a durable regime (Dose, 2019). This distinction matters for digital and AI education because the field needs continuity, public purpose and institutional capacity across infrastructure, data governance, teacher development, curriculum, procurement and school implementation.

Existing literature focus on the actors and institutional structures of digital education governance. An interesting gap, then, is about how coordination capacity is perceived and enacted by actors within privileged positions across the field. This matters because coordination is partly interpretive. Actors coordinate through formal roles and mechanisms, but also through how they understand their own responsibilities, the roles of others and the purpose of joint action. Stakeholder perceptions are therefore important evidence of how coordination works in practice (van Popering-Verkerk et al., 2022), as it can illuminate in-situ governance arrangements. This is the gap addressed by this thesis: how coordination capacity is perceived and enacted in Chile's digital and AI education governance.

Chile is a revealing case. The conditions that make coordination difficult are concentrated here: dispersed authority, strong private participation, school-level purchasing and a state that often steers indirectly. At the same time, recent work on higher education shows that the Chilean state can strengthen coordination when the institutional architecture locates that function clearly (Alarcón and Brunner, 2024).

This thesis examines how senior actors across Chile's digital and AI education field perceive coordination, and what enacted coordination dynamics reveal about the field's governance configuration. It uses a convergent parallel mixed-methods design. The study integrates an elite survey of 58 strategically positioned stakeholders with 17 semi-structured interviews involving 18 participants. Both strands were organised around five dimensions of coordination capacity: shared understanding, role clarity, coordination mechanisms, multi-level and cross-sector coordination, and uncertainty management. The survey identified where coordination was perceived as stronger or weaker. The interviews examined how these patterns were experienced, interpreted and enacted. The strands were then integrated through a joint display.

The study is guided by two research questions:

RQ1: How do key stakeholders perceive coordination capacity in Chile's digital and AI education governance?

RQ2: What do enacted coordination dynamics reveal about the governance configuration of Chile's digital and AI education system?

This thesis argues that coordination in the field is active, plural and weakly cumulative. Coordination is dense on an operational plane of mechanisms and relationships, while weaker on a cognitive plane of shared meaning, role recognition and direction. The two planes are barely connected. I read this configuration as a heterarchy without a strategic anchor, so a field where coordination is performed, while the institutional location that could turn dispersed activity into shared direction remains weak.

The thesis contributes in three ways. Empirically, it offers an integrated, perception-based account of coordination in Chile's digital and AI education governance. Analytically, it develops a two-plane reading of coordination capacity and names the governance configuration this produces. Methodologically, it shows how a convergent mixed-methods parallel design can provide breadth and depth, while integration produces complementary results. The wider significance is developmental. If digital activity becomes shared direction

matters for whether digital and AI transformation narrows or deepens educational inequalities, and for whether a middle-income country can steer its own sociotechnical transformation.

The thesis proceeds as follows. Chapter 2 reviews the literature on digital education governance, coordination and Chile as a strategic case. Chapter 3 presents the analytical framework and the five coordination dimensions. Chapter 4 explains the mixed-methods design, data collection, analysis and integration strategy. Chapter 5 presents the integrated findings. Chapter 6 discusses their theoretical and policy significance. Chapter 7 concludes.

2. Literature Review

This literature review situates the governance of digital and AI education as a problem of coordination dynamics.

This chapter builds the coordination lens in three moves. It frames digital and AI transformation as a governance problem with a political economy, develops coordination as the analytic lens of the thesis, then situates both in Chile as a strategic case. The gap it reaches is how actors across the education system perceive coordination, extending it to heterarchy and the importance of perceptions through which coordination is enacted. The gap I address is how actors across a digital policy education field perceive coordination, and what those perceptions reveal about Chile's governance configuration in digital education provision

2.1 From digital access to digital governance

International debates have moved digital education beyond infrastructure and access towards questions of governance, system capacity, and institutional coherence (UNESCO, 2024). Earlier ICT education policies were often organised around the provision to devices, connectivity, software, and basic digital skills (Claro and Jara, 2020), but these policies reflected a deeper tension. One view treats technology as a technical solution for improving

existing education systems, motivated by efficiency and higher returns to investment (Selwyn, 2024). A second understands digitalisation as a deeper social shift, one that asks education systems to rethink their relationship with the digital world at large (Erstad and Voogt, 2018). This second view connects more closely with human-development, where the value of technology depends on the freedoms and forms of democratic participation it enables (Sen, 1999; Kleine, 2010).

These visions remain present, but the governance problem has become more demanding. Digital education is now connected to wider transformations in production, knowledge, and public administration, often framed as the Fourth Industrial Revolution (Schwab, 2016). Covid-19 accelerated this shift by making digital systems central to educational continuity and exposing the fragility of policies focused on access (Williamson, Eynon and Potter, 2020). Furthermore, AI development can now personalize learning and penetrate in all educational process through data-driven decision-making (Holmes et al., 2019). In this way, digital technologies are also increasingly embedded in policy infrastructures (Selwyn, 2016), raising crucial ethical questions (Williamson and Eynon, 2020). As a result, this has reinforced ‘promissory’ narratives in which digital transformation is promoted as an urgent response both to utilitarian and humanistic concerns (Auld and Elfert, 2024).

Digital governance can therefore be understood as the way public systems steer digital transformation, as a systemic process that reshapes roles, authority relations, and dependencies (Vial, 2019). Janowski (2015) argues that digital-government maturity is contextual and policy-driven. From a macro-Schumpeterian perspective, this means that digital transformation’s outcomes depend on how technology is combined with organisational models and public policy regimes (Bodrožić and Adler, 2022). This gives public steering a leading role. Industrial policy literature similarly shows that structural transformations require coordination, learning and institutional capacities that markets rarely provide on their own (Juhász, Lane and Rodrik, 2024)

As evidence shows, digital technologies can consolidate and increase social inequalities in skills’ acquisition (Goudeau et. al., 2021), while weak public steering can increase dependence

on external infrastructures and standards (Mügge, 2024; Gulson and Sellar, 2019). This can be exacerbated in global south contexts (Olanrewaju et al., 2021), given the type of content and unequal access to technologies (Hamilton, 2020). Pandemic evidence shows how quickly these inequalities materialize in times of disruption (Bonal and González, 2020), while Chilean evidence shows that socioeconomic status shape digital-skills performance beyond access alone (Claro et al., 2015). Therefore, the capacity of education systems to coordinate sociotechnical change democratically has broad implications on digital sovereignty and educational futures (Sriprakash et al., 2024).

2.2 The political economy of EdTech

The political significance of EdTech lies in how it redistributes authority. Political economy approaches show that EdTech markets are structured by investment networks, intermediaries, corporate strategies, and policy agendas (Regan and Khwaja, 2019). Villalobos et al. (2024) depicts EdTech as a polysemic field in which different actors can use the same term while attaching different meanings to it. This creates a coordination problem.

This change is best understood as platformisation: the penetration of the infrastructures, economic processes, and governmental frameworks of platforms into different sectors and spheres of life (Poell, Nieborg, & van Dijck, 2019). In schooling it works on three levels at once. Technically, schools come to depend on architectures built and run elsewhere. Economically, Komljenovic (2021) calls the result the "education rentier": systems pay recurring fees to use software and reach the data inside it, becoming tenants of infrastructure they neither own nor control. In this way, platformisation ties education's components such as procurement, pedagogy, and data governance, into single contractual relationships.

This shifts authority toward private and hybrid actors. The pandemic accelerated it, drawing start-ups, philanthropists, and venture capital into running public education; Avelar (2025) maps these actors at the centre of Brazil's networks, not its margins. Fontdevila et al. (2021) find corporations acting as policy actors, while Edwards et al. (2021) trace the same shift

across Latin America. Ball and Junemann (2012) argue that education governance increasingly occurs through networks that mobilise expertise and resources but generate blurred accountability and dependence on actors whose objectives do not necessarily align with public educational goals. Without coordinated public steering, this dynamic intensifies uneven capacities across the system (Parcerisa, Verger and Falabella, 2020).

Hence, poor public steering can carry both equity and sovereignty concerns. This raises the concern of how public education systems can coordinate distributed actors, infrastructures and capacities around shared and equity-driven educational purposes.

2.3 Governance as coordination

In a policy field of distributed authority, outcomes depend on the network of actors whose separate decisions, taken together, shape the governing conditions of said field. Therefore, governance is understood here as the structured coordination of interdependent actors across institutional, sectoral, and territorial boundaries through combinations of hierarchical, network and market mechanisms (Rhodes, 1996; Pierre and Peters, 2000; Mayntz, 1993).

This situates my research within the ‘Governance Perspective,’ an analytical strand developed in German-speaking political science and later applied to education (Altrichter, Brüsemeister and Wissinger, 2007). This approach uses a non-normative idea of coordination, to explore how regulation and performance of education systems are achieved, sustained, and transformed through coordination of action between multiple social actors in multilevel governance (MLG) systems (Altrichter, 2010). In this way, it builds on actor-centred institutionalism, which understands policy outcomes as the product of actors interacting within institutional constraints (Scharpf, 1994).

This strand is adopted deliberately because it fits the case. Digital and AI education governance is dispersed across public, private, and intermediary actors, and steering capacity cannot be assumed to sit within a single dominant institution. An actor-centred governance perspective is therefore useful for examining how coordination is produced across a changing

field marked by fast-moving technologies, shifting mandates and uncertain institutional responsibilities. Benz (2019) says coordination becomes central when actors, functions, and levels multiply, since no single centre can steer the whole. The choice also has a Chilean precedent that will be explored later.

Coordination is therefore a repertoire of mechanisms. Bouckaert, Peters, and Verhoest (2010) distinguish hierarchy, market, and network as its basic modes, showing how public-sector specialisation, multiplies the points at which initiatives must be aligned. Benz (2019a) similarly argues that governance under complexity depends on connected structures able to manage interdependencies across actors, functions, and levels. Dose (2019) frames this as the management of behavioural interdependencies among actors who cannot achieve their goals alone. Schimank (2007) even when coordinated, designs often produce unintended effects, while more durable patterns can emerge without being designed by anyone. Coordination is therefore dynamic, shifting as actors, institutions, instruments, and priorities change over time.

Therefore, coordination operates in different layers. Dose (2019) distinguishes governance mechanisms, such as bargaining, mutual adjustment and informal influence; governance forms, such as hierarchies, networks, and markets; and governance regimes, as stable combinations of forms that organise a policy field over time. This distinction matters because coordination activity, in other words, is not the same as systemic direction.

A further distinction in the literature is central to this thesis. Honig and Hatch (2004) understand policy coherence as requiring shared sense-making over goals and strategies, alongside structures that bridge external demands to practice. Christensen and Lægreid (2007) similarly argue that coherence depends on cultural integration, shared values, and joint purpose, not mechanisms alone. Okhuysen and Bechky (2009) distinguish the conditions that make coordination possible, such as shared understanding, accountability, and predictability, from the mechanisms that carry it, such as plans, rules, roles, and routines. This echoes Scharpf's (1994; 1997) distinction between negative coordination, where actors avoid obstructing one another, and positive coordination, which requires strategic alignment. Taken

together, this points to a recurring separation between a cognitive register of shared diagnosis and joint framing, and an operational register of mechanisms, roles, and routines.

Then, coordination dynamics refers to the ability of a governance ecosystem to manage interdependencies across actors, levels and sectors, treated as shared-meaning, role-clear, mechanism-supported, cross-boundary and temporally sustained. These five features become the five analytic dimensions, further elaborated in the next chapter.

2.4 Distributed Governance and Chile as strategic case

The previous sections describe a field in which authority is distributed across public agencies, private providers, platforms, and intermediary actors. Governance literature often describes this kind of arrangement as heterarchical, so that coordination does not flow from a single centre, but from the interaction of hierarchies, markets and networks that coexist and overlap (Jessop, 2004; 2023). In this way, the State's steering role changes, acting as a meta-governor that shapes the conditions under which others coordinate (Jessop, 2004).

Furthermore, Stark (2009) develops that heterarchical settings are characterised by competing evaluative principles operating in parallel, generating productive dissonance, friction between competing principles allows actors to recognise alternatives, recombine resources and produce coordination as an emergent outcome. Heterarchy is not in itself problematic. Distributed authority may be necessary because knowledge, legitimacy and implementation capacity are dispersed. Hence, whether a heterarchical system can coordinate depends on the mutual recognition of competing principles as legitimate articulations of a shared field. As aforementioned, this is crucial in evaluating coordination in a polysemic field.

The focus on stakeholder perceptions follows from this logic, as coordination in complex and heterarchical systems depend not only on formal design but on how actors interpret their roles. Perceptions are evidence of how coordination is enacted. Implementation research has long shown that policies are interpreted, adapted, resisted, and enacted by actors in specific institutional contexts (Pressman and Wildavsky, 1973; Honig, 2006; Spillane, 2005). When actors perceive governance as fragmented or externally imposed, they may comply formally

while resisting substantively. Implementation success depends on policy design, contextual factors and the active mediation of implementers, a process particularly unstable in digital and AI reform where technological change redistributes authority faster than regulatory adaptation. Within this implementation-as-sense-making perspective, Star and Griesemer's (1989) concept of boundary object describes artefacts, vocabularies or categories that maintain a recognisable identity across institutionally separate communities while taking on different meanings in each. Furthermore, this also matches our stance of coordination as a dynamic phenomenon, as Van Popering-Verkerk et al. (2022) treat governance capacity as a property of interacting actors, visible in attempts at concerted action.

For these purposes, elite stakeholders are particularly relevant because they hold positional knowledge of the governance ecosystem. Following Hoffmann-Lange (2007), elite status can be understood as strategic location within a field of influence. The participants in this study include actors from public agencies, subnational levels, private providers, civil society, academia, international organisations, and school-system intermediaries. Perception-based analysis reveals governance blind spots that formal indicators cannot capture. For these reasons, I consider studying perceptions as an effective way of examining how coordination is understood and produced from within a fragmented governance field, given the constraints of this research.

Chile offers a strategic case for this problem. Since the 1980s, Chile's education system has been largely described as a paradigmatic market-oriented model, shaped by vouchers, school choice, private provision, a subsidiary role for the state and high-stakes accountability (Bellei, 2015; Villalobos and Quaresma, 2015; Verger et al., 2016; Parcerisa and Falabella, 2017; Treviño et al., 2018). Authority over schooling is therefore distributed across public and private hands by design, with unequal effects across social groups. This makes Chile less a typical case than a revealing one: the conditions that make coordination difficult, dispersed authority, private actors with independent leverage and a state that often steers indirectly, are present in concentrated form.

Digital education entered this already fragmented architecture. Enlaces was the main state-led digital education initiative for more than two decades, expanding infrastructure, digital resources, teacher training, and digital skills (Jara, 2008, 2013; Severin, 2016; Claro and Jara, 2020; Claro et al., 2022). In 2018, however, Enlaces was absorbed into the Ministry's Innovation Centre, shifting the state's role from direct digital policy leadership towards the articulation of public and private actors around innovation (Claro et al., 2022). Across three decades of policy, Paredes-Aguila and Rivera-Vargas (2023) identify real expansion alongside persistent gaps in coverage, digital development, and pedagogical integration. The agenda moved institutionally, but a settled coordinating direction did not clearly follow.

Villalobos et al. (2024) make the contemporary problem visible. They show that digitalisation in Chile has expanded through a heterarchical and weakly coordinated network of state agencies, EdTech firms, philanthropic foundations, international organisations, and intermediary actors. Their argument is not that the state simply disappears, but that public steering is reconfigured through new forms of dependence, policy access, and private participation. Therefore, key stakeholders in the field become relevant not only as providers of tools, but as actors that shape the meanings, infrastructures, and practices of digital education itself.

Covid-19 intensified this trajectory by combining an external crisis with endogenous features of the Chilean system: market-oriented schooling, fragmented provision and a growing EdTech sector. The pandemic reinforced technosolutionist narratives and facilitated the entry of Big Tech and national technology providers into schooling (Morozov, 2014; Williamson and Hogan, 2020; Claro et al., 2022; Villalobos et al., 2024). This raises questions of democratic governance, data protection, privacy, digital sovereignty, and the role of the state in steering educational digitalisation.

In contrast, Alarcón and Brunner (2024) find the state moving after 2018 towards a stronger role as regulator, evaluator and funder, recentralising coordination in a system that remains complex. This comparison rules out a simple explanation in which the Chilean state is inherently unable or unwilling to coordinate education actors. This makes Chile a strategic

case, allowing my thesis to examine more closely the coordination dynamics that shape the governance configurations of heterarchical activity, as interpreted by key actors, where coordination is perceived to exist, where it fails to be, and its characteristics.

2.5 Synthesis and research gap

Taken together, the literature establishes that Digital and AI transformation in education is fundamentally a governance problem, as policy steering increasingly runs through data infrastructures and their platforms. This redistributes authority over public schooling towards private and hybrid actors, framing coordination as a central question. In line with governance scholarship, I consider coordination as multi-modal, dynamic and transintentional. In heterarchical fields of distributed authority, perceptions become a necessary entry point for studying how coordination is interpreted and enacted by those from distinct positions within the field.

The literature gap is how coordination capacity can be characterised when coordination activity exists without those efforts necessarily becoming shared direction. Dose's (2019) distinction helps specify the problem: coordination may be active at the level of mechanisms without settling into stable governance forms or regimes. This problem has rarely been studied from the perceptions of actors positioned inside a digitalising and heterarchical education system. This is important because those actors' interpretations of roles, responsibilities, mechanisms, and priorities help shape how coordination is enacted. Chile is a strategic setting for examining this gap because it combines a market-oriented and heterarchical school system, an expanding EdTech field and evidence that the state has recently strengthened coordination in neighbouring sectors. The stakes are both equity and development: whether dispersed activity becomes shared direction affects the inequalities digitalisation may widen and the capacity of a high middle-income country to steer its own digital transformation.

This thesis therefore takes as its object the coordination of digital and AI transformation in Chilean school education. Following the Governance Perspective, coordination is treated as

something achieved, sustained, and transformed through the action of many actors in multilevel systems (Altrichter, 2010; Benz, 2019). The empirical question is how actors positioned across Chile's digital and AI education field perceive coordination: where they see shared meaning, role clarity, mechanisms, cross-boundary articulation, and continuity, and where these dimensions fail to align. The next chapter develops the analytical framework used to study these coordination dynamics.

3. Analytical Framework

This chapter sets out the analytical framework that organises the study, building directly on the coordination lens developed in Chapter 2. As Chapter 4 will further elaborate, my research uses a convergent parallel mixed-methods design. For that reason, both survey and interview, share the same analytical spine. These are the five dimensions of coordination capacity used to examine how digital and AI education governance is perceived and enacted across the field.

The first dimension is shared understanding. I cover whether actors converge on what digital and AI initiatives are for, or whether they attach different purposes to them. Following Schimank (2007), this dimension treats coordination as partly cognitive and normative: actors do not only perform roles, but they also interpret the field, define problems, and attach meaning to collective action.

The second dimension is role clarity. It examines whether responsibilities, mandates and boundaries are legible to the actors expected to work across them. This draws on public-sector coordination literature, where unclear mandates and overlapping responsibilities are central sources of fragmentation (Bouckaert, Peters, and Verhoest, 2010). It also connects to the Chilean case, where Alarcón and Brunner (2024) describe dense multiple-principal relationships in which it is not always clear who answers to whom.

The third dimension is coordination mechanisms. It focuses on the instruments through which actors attempt to align action, including formal mechanisms such as committees, protocols,

funding arrangements, and strategic plans, as well as informal exchanges that often carry much of the practical work. The framework also distinguishes between thinner forms of coordination, such as information-sharing, and thicker forms, such as joint planning or shared strategy (Bouckaert, Peters, and Verhoest, 2010; Dose, 2019).

The fourth dimension is multi-level and cross-sector coordination. It captures whether alignment occurs vertically across levels of authority and horizontally across sectors, agencies, and jurisdictions. As Chapter 2 argued, this is especially relevant in digital and AI education governance, where private firms, international organisations, public agencies, schools, and intermediary actors may all participate in shaping the field. Benz (2019) is useful here because he shows that coordination becomes central when authority is distributed across levels and no single centre can steer the whole.

The fifth dimension is uncertainty management. This I examine how coordination is sustained, adapted, and learned over time as technologies, priorities and institutional responsibilities change. This was especially relevant because the fieldwork took place during a period of rapid AI development, when new models, policy expectations, ethical concerns, and change in executive power, were clearly visible to participants. This dimension draws on Vial's (2019) account of digital transformation as a process of sensing, adapting and reconfiguring resources, and on Benz's (2019) understanding of coordination under complexities.

Together, these five dimensions give the analysis a common structure. They are conceptual, but also operational: each dimension is translated into three to four survey items and a corresponding strand in the interview guide. The framework is designed to examine how the dimensions appear across actors and institutional positions, and whether they align or diverge in practice. The joint display then brings the quantitative and qualitative strands together, allowing the thesis to read coordination dynamics as a pattern.

4. Methodology

This chapter explains the parallel convergent mixed methods design I employed. Following Toshkov (2016), the chapter begins from the research problem and explains how the design, instruments, sampling, analysis, ethics, and reflexivity were aligned to generate valid answers.

The research problem emerged from my internship experience working on UNESCO's Digital Education Action Framework for Chile (2025), exposing me to 'coordination' as a recurring challenge in the national digital education agenda. This connected with my earlier participation in Chile's student movement and my own social background, shaping my interest in equality and public education. Accordingly, as digital and AI transformation increasingly shape education systems, it becomes important to understand how these processes are governed and how they may be steered towards more equitable forms of development.

Hence, this thesis uses pragmatist epistemology, because the methodological choices follow from the research problem (Creswell and Plano Clark, 2018), moving beyond rigid dichotomies between postpositivism and constructivism (Tashakkori and Teddlie, 2003). Pragmatism treats scientific inquiry as a practical process concerned with the knowledge required and the practical consequences of research (Morgan, 2007; Biesta, 2010), supporting the integration of diverse forms of evidence in mixed methods designs (Creswell, 2014).

The knowledge required for this study is analytical, as I sought to understand the dynamic nature of a governance field marked by ongoing changes and distributed authority. Thus, I considered avoiding a normative model of good governance appropriate. The governance perspective supports this purpose because it studies coordination as a relational process among interdependent actors, while still addressing a problem with practical consequences for more equitable educational development in Chile.

Furthermore, this reflects the study's ontological stance. In pragmatism, epistemology and social ontology are linked. If knowledge is generated through inquiry and problem-solving, social realities cannot be treated as structures detached from meaningful practice (Dewey, 1938; Frankel Pratt, 2016). In short, "a social ontology better suited to explain both the

maintenance and the transformation of social reality” (Testa, 2017, p. 40). As post-pandemic acceleration, platformisation and emerging AI agendas are changing society, coordination becomes an empirical entry point for examining the enactment of existing governance arrangements in the provision of digital education initiatives.

The research questions therefore required a design able to capture both patterned perceptions across the field and situated accounts of how actors make coordination work in practice. Hence, two questions guide the study:

RQ1: How do key stakeholders perceive coordination capacity in Chile's digital and AI education governance?

RQ2: What do enacted coordination dynamics reveal about the governance configuration of Chile's digital and AI education system?

Therefore, I use a convergent parallel mixed-methods design, in which quantitative and qualitative data are collected during the same fieldwork phase, analysed separately, and brought together at the interpretation stage (Creswell, 2014; Creswell and Plano Clark, 2018). RQ1 examines how stakeholders perceive coordination across a shared set of dimensions, while RQ2 examines how those are enacted through actor's practices, meanings, and institutional positions. Each instrument has a primary focus: the survey captures broad patterned perceptions of coordination arrangements, while the interviews show how actors make sense of those arrangements in practice.

The design is convergent in timing and integration logic and qualitatively driven in analytical weight because the interview material carries the main interpretive work (Mason, 2006). This asymmetry is a deliberate feature of the design. The main purpose of mixing methods is complementarity, understood as the use of different methods to enhance the interpretability, meaningfulness, and validity of results (Greene, Caracelli and Graham, 1989). The survey maps perceived coordination across governance dimensions for breadth and comparability, while the interviews explore enacted coordination for depth and context. Integration therefore addresses coordination as both systemic perception and enacted practice.

The five coordination dimensions structure both instruments, serving as parallel constructs, and make integration possible through joint displays and complementary interpretation, following Fetters, Curry and Creswell's (2013) argument that integration must be planned as an active part of mixed-methods design. The procedural diagram can be seen in Figure 1, below, based on inductive/deductive mixed-methods illustrations in Proudfoot, K. (2023). The following sections explain my sampling strategy, the survey, interviews, and integration.

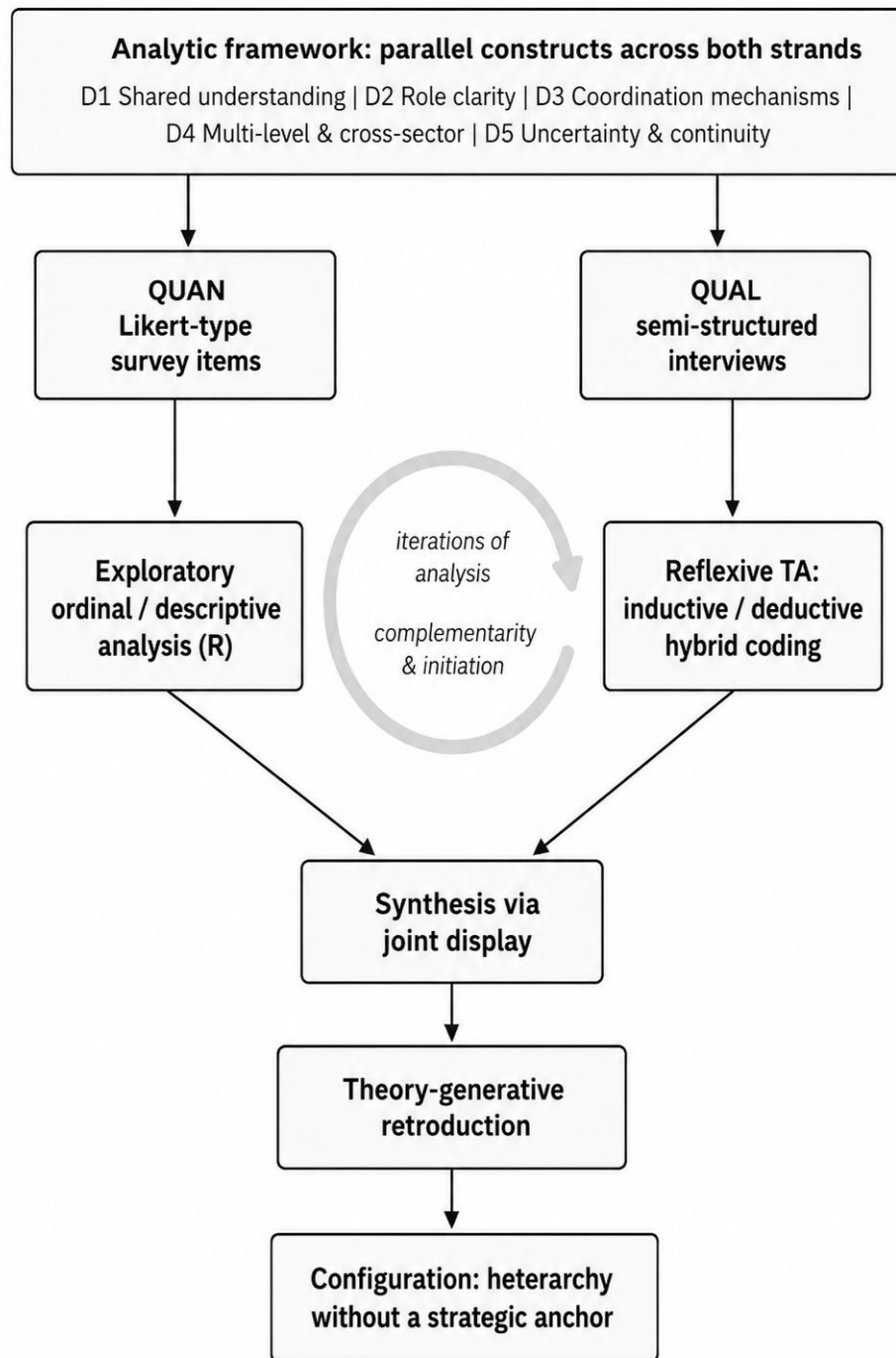


Figure 1 Procedural Diagram.

4.1 Sampling strategy

I used purposive sampling because the study required participants with specialised knowledge of digital education governance or strategic positions within the policy ecosystem. Purposive sampling is appropriate when participants are selected for their capacity to provide information-rich accounts of the phenomenon under study (Patton, 2015), and when the aim is to construct an analytically meaningful sample aligned with the research questions (Robinson, 2014). The aim was therefore to reach actors taking part of digital education policy spaces.

Participant selection followed a positional approach to elite identification (Hoffmann-Lange, 2007), consistent with elite-interview research where participants are selected for what they know and where they are positioned in relation to the process under study (Aberbach and Rockman, 2002; Harvey, 2011). The assumption is that power and influence are tied to the resources associated with positions of leadership, identifying participants through the authority and access attached to them. This was appropriate for examining coordination in Chile's fragmented digital education governance ecosystem, although this approach limitation is that I had to define which sectors, organisations and hierarchical levels counted as relevant.

I built the sampling frame from four sources. First, I used the publicly available stakeholder list associated with Chile's Digital Education Action Framework (Ministerio de Educación de Chile and UNESCO, 2025). Second, I drew on OECD mappings of Chile's digital education ecosystem to identify relevant institutions and reform areas (OECD, 2017, 2023). Third, Villalobos et al.'s (2024) network analysis of Chilean EdTech governance informed the inclusion of private, intermediary, and civil-society actors. Fourth, comparative work on digital education network governance in Brazil supported the relevance of these actor categories in heterarchical settings (Avelar, 2025).

The resulting stakeholder categories included central-government actors, subnational and school-system actors, civil society organisations and foundations, private-sector EdTech and technology firms, universities and research bodies, and international organisations. These

categories were selected because the study examines coordination across levels and sectors, following the governance logic developed in Chapter 2.

The survey received 84 responses, of which 58 were complete. I excluded 26 incomplete responses because they contained no substantive Likert-type data. The interview sample was recruited through the survey, where respondents could indicate separately whether they agreed to be contacted for a follow-up interview. This protected confidentiality in an elite setting and supported the integration logic of the design, since interview participants had already engaged with the survey. In total, 32 voluntary follow-up forms were received, which speaks on the effectiveness of this strategy. I prioritised actors able to speak from different relevant positions of leadership in the ecosystem, including central government, civil society and foundations, international organisations, academia, private and EdTech actors, higher education, technical education, training and employment, and one school-level practitioner.

The final qualitative sample comprised 18 stakeholder accounts. One interview involved two participants from the same organisation, identified as P01a and P01b. I treat this as one institutional account while preserving each speaker's attribution. The full sample composition is presented in Appendix F. Interview sample composition is not shared per ethical reasons, showed in the Participant Information Sheet (Appendix I) and consent form (Appendix J).

The sample has limitations. It is purposive, uneven across actor categories and concentrated in central-level perspectives, so it does not support statistical generalisation or an exhaustive account of subnational and school-level dynamics. These limits reflect the practical constraints of my research, as single-researcher fieldwork, the timeframe of a master's thesis, difficulties reaching senior, regional, school-level, and expert actors during the Chilean summer period, and a period of executive-power political transition.

4.2 Quantitative strand: survey design and analysis

The quantitative strand addresses RQ1 through a cross-sectional, fully anonymous online survey administered via Qualtrics. The instrument comprised seventeen closed-ended items using a five-point Likert format, from strong disagreement to strong agreement, with an additional Don't Know / Not Applicable (DK/NA) option. A full technical report is attached in Appendix H.

This option was included to avoid forcing answers when participants lacked sufficient information. Since don't-know responses can indicate uncertainty, limited knowledge, or question difficulty (Krosnick, 2002; Mondak and Davis, 2001), I reported DK/NA frequencies descriptively before recoding them as missing for statistical procedures. In this study, DK/NA responses were treated as signals of the limited visibility of coordination processes. The Likert format was chosen for its brevity and accessibility in a senior, time-pressed population, with average completion taking around ten minutes.

The survey instrument was constructed from the five coordination dimensions developed in Chapter 2. To strengthen content validity, each dimension was translated into observable coordination conditions, which were then operationalised through the seventeen Likert-type items shown in Table 1. The full survey is in Appendix B.

Table 1 Construction of Survey items

Operationalisation of survey dimensions		
<i>Dimension</i>	<i>Survey items</i>	<i>Observable coordination conditions</i>
Shared understanding	Items 1–3	Common objectives, alignment with national policy priorities, and clear communication of scope and purpose
Role clarity	Items 4–6	Understanding of roles and responsibilities, allocation of coordination responsibility, and mandate overlap
Mechanisms	Items 7–9	Formal coordination mechanisms, informal interaction, and learning through repeated engagement
Multi-level coordination	Items 10–12	Coordination across national, regional and local levels, differences in institutional priorities, and the role of external actors
Uncertainty management	Items 13–17	Political transition, long-term continuity, future policy uncertainty, and the importance of coordination for sustainability

Source: Author's elaboration.

The instrument was first drafted in English from the analytical framework, translated into Spanish by the researcher, and reviewed by the supervisor, who also speaks Spanish. This review supported conceptual consistency with the framework and linguistic clarity for Chilean respondents. The main Likert items appeared first, ordered by dimension and uninterrupted. Stakeholder-typology variables, including institutional affiliation, region, role, professional experience, involvement in digital or AI initiatives and policy familiarity, appeared at the end. The visuals included a University of Glasgow logo for credibility, and easy-to-fill design (Appendix C). A separate follow-up section (Appendix D) invited respondents to provide contact details for an interview; these details were collected only for scheduling and were not linked to anonymous survey responses.

Respondents in the analytic sample were highly experienced: 74.1 per cent reported more than fifteen years of professional experience, 60.4 per cent held senior or middle-management roles, and 37.9 per cent reported leading or coordinating relevant initiatives.

Responses were concentrated in the Metropolitan Region of Santiago (81.0 per cent), reflecting both the centralised character of the field and the limits of the sample. A full sample profile is provided in Appendix F.

The analysis was conducted in R and remained descriptive and exploratory. I treated the Likert-type items as ordinal because the distance between response categories cannot be assumed to be equal (Jamieson, 2004; Boone and Boone, 2012). I therefore prioritised response distributions, medians, and interquartile ranges. Means and standard deviations were used only as supplementary summaries. Dimension-level scores were calculated through respondent-level medians across the items belonging to each dimension, preserving the ordinal character of the data while allowing comparison across the five dimensions.

The analytical sequence followed the steps summarised in Appendix G. First, item- and dimension-level descriptives mapped distributions, dispersion, and DK/NA patterns. Second, Cronbach's alpha and Kendall's coefficient of concordance assessed whether items within each dimension cohered sufficiently to support dimension-level interpretation. Alpha was used only as an exploratory diagnostic of internal consistency, following warnings against treating it as a definitive validation test (Tavakol and Dennick, 2011; Sijtsma, 2009). Low alpha values were treated as substantively informative and are interpreted in Chapter 4. Third, Spearman correlations explored associations between dimension scores, while polychoric correlations and hierarchical clustering provided robustness checks for the ordinal item structure (Olsson, 1979). Fourth, non-parametric tests explored differences across actor groups and between cognitive and operational coordination scores, with Benjamini-Hochberg adjustment to reduce overinterpretation across multiple comparisons (Benjamini and Hochberg, 1995). Supplementary outputs are reported in Appendix H.

Altogether, I provide a structured map of perceived coordination conditions. Its purpose is exploratory, the realised sample is purposive, and smaller than anticipated, uneven across actor categories and concentrated in central-level perspectives. The cross-sectional design also captures perceptions at one policy moment in a fast-moving field. For these reasons, the qualitative strand carries the situated explanations developed in the next section.

4.3 Qualitative strand: interviews and analysis

The qualitative strand addresses RQ2. I used semi-structured interviews because they provide a common structure across participants, while allowing each actor to explain coordination from their own experience (Kvale and Brinkmann, 2009; Mason, 2006; Seidman, 2006). My interview guide was organized around the five coordination dimensions, with additional questions on policy experience and participant's own understanding of coordination. This was appropriate for research with elite and expert participants, who are selected for their specialised knowledge and proximity to the field (Aberbach and Rockman, 2002; Harvey, 2011). Hence, interviews could examine how actors understood coordination problems, described their positions, and interpreted interdependence. The full guide is included in Appendix A

I analysed the material through reflexive thematic analysis, following Braun and Clarke's approach to thematic analysis and its later reflexive development (Braun and Clarke, 2006, 2019, 2021). I locate my use of TA toward the Big Q, interpretive end of the spectrum. This was coherent with the pragmatist and relational orientation developed in Section 3.1. Coordination was treated as something actors describe, enact, and make consequential through situated practice. Thematic analysis was suitable because it is theoretically flexible, allows patterns of meaning to be identified across a data set (Braun and Clarke, 2006).

I conducted the interviews in Spanish through Microsoft Teams between 1 March and 9 April 2026. Each interview was preceded by written informed consent. Automated transcripts were manually checked against the recordings, pseudonymised, and imported into NVivo. This checking process also supported familiarisation with the data. Participants were organised as cases with attributes for actor type, sector, and governance level, allowing cross-case comparison while preserving the situated character of each account.

The analysis combined semantic and latent attention. At the semantic level, I examined how participants explicitly described coordination, roles, mechanisms, and uncertainty. At the latent level, I interpreted the assumptions, institutional positions and governance logics

shaping those accounts. This distinction was important because the study examines how actors make sense of coordination from specific locations within the policy field.

I developed themes as patterns of shared meaning organised around the five dimensions, with inductive attention. Categories were not mechanically extracted from the data (Braun and Clarke, 2019). I moved through the six phases of analysis: familiarisation, coding, generating initial themes, reviewing themes, defining, and naming themes, and writing. This involved movement between transcripts, coded extracts, memos, and emerging interpretations. Subsequently, coding combined a theory-informed scaffold with an inductive layer. The five coordination dimensions structured my initial reading and maintained continuity with the survey. The inductive layer captured patterns specific to the Chilean case, including declarative coordination, personalised authority, institutional amnesia, and temporal politics. Following Saldaña (2013), I treated codes as analytical links between data segments and broader patterns of meaning. Codes were revised, merged, and refined through repeated readings.

NVivo supported organisation, retrieval, and cross-case comparison, while interpretation remained researcher-led (Lewins and Silver, 2007). In reflexive thematic analysis, quality rests on theoretical clarity, transparency, and sustained engagement with the data (Braun and Clarke, 2019, 2021). I therefore treat codes as working tools, and the themes developed in the findings operate at a higher analytical level, as I identify what these accounts reveal about coordination as an enacted governance accomplishment.

Reflexivity was part of this process. My training as an economist and political scientist initially oriented me towards a positivistic reading of the interviews, whereas RTA required a stance in which subjectivity and interpretation are part of knowledge production.

4.4 Integration strategy

Both analyses were integrated for complementarity within an asymmetrical convergent design (Greene, Caracelli and Graham, 1989; Creswell and Plano Clark, 2018). As survey shows system-level patterns of perceptions, while the interviews and interpretation of these accounts

in practice, integration aims to illuminate the same governance problem through complementary angles. The design also draws on what Greene, Caracelli and Graham (1989) call initiation. In the cases where survey patterns and interview themes diverged, I analysed it to make logical conclusions from them. This reveals features of coordination which no analysis can reach alone.

I analysed the quantitative and qualitative strands separately before bringing them into structured dialogue through joint displays organised around the five coordination dimensions (Fetters, Curry, and Creswell, 2013; Guetterman, Fetters, and Creswell, 2015). Joint displays align the survey patterns for a dimension, including medians, dispersion, concordance, exploratory actor-group comparisons, and DK/NA frequencies, with the corresponding qualitative themes and illustrative excerpts, as advised for convergent designs (Fetters and Tajima (2022)). The joint displays are included in Appendix K.

The five dimensions provide the common analytic framework for integration because they structure both instruments. I use this framework as parallel constructs linking survey items, interview questions, and my analytical interpretation. The findings then, builds on the latter, following a higher-order analytical level, generated through this integration process. In this sense, the dimensions are the input to integration, while the findings chapter presents the final analytical architecture as an output of the integration process.

The quality of integration was addressed by preserving the integrity of each strand before generating inferences, and I also make convergence and divergence explicit, and grounding integrated claims in the joint displays. This allowed my thesis to connect RQ1 and RQ2 directly, as the final analysis explains why and how coordination is active in practice while remaining weakly cumulative as system-level governance.

4.5 Ethics and data management

The research received approval from the University of Glasgow School of Education Research Ethics Committee on 28 February 2026 (Application No. 402250023), with a project end date of 20 September 2026. All participants received an information sheet

explaining the study's purpose, voluntary nature, confidentiality procedures, withdrawal rights, and explicitly non-evaluative framing. The survey consent was obtained through initial screening questions before participation, and interview consent included permission to record, with participants able to pause recording or decline any question, as well as the option to withdraw from the study up-to-two weeks after the interview took place.

Data collection and analysis used institutionally supported tools. The survey was administered through Qualtrics. Interviews were conducted through Microsoft Teams. Survey data, audio recordings, automated transcripts and pseudonymised cleaned transcripts were stored on the University of Glasgow OneDrive environment. Contact details for interview follow-up were stored separately from survey responses. Quantitative analysis was conducted in R and qualitative coding in NVivo. Files were pseudonymised using participant IDs (P01 to P17), and reporting avoids identifying individuals or attributing sensitive claims to identifiable organisations unless the relevant information is already public and analytically necessary. Data are handled in line with GDPR principles.

4.6 Limitations and positionality

Finally, both strands may include self-selection effects since actors already involved in digital and AI governance debates were more likely to participate. The study's non-evaluative framing was designed to reduce reputational filtering, but self-selection is treated as part of the sample to be interpreted. Also, my participation in a policy-making process opened access to senior stakeholders, which was important given the closed nature of the field and the practical limits of a master's thesis.

The analysis does not claim outsider neutrality. Instead, it claims declared and situated proximity to the field. These conditions are made explicit so that readers can assess the study's cross-case claims with a clear understanding of the researcher's relationship to the field, consistent with Braun and Clarke's (2021) view of researcher subjectivity in reflexive thematic analysis.

5. Findings

In this chapter, I argue that coordination dynamics in Chile's digital and AI education system is active and plural, but weakly cumulative. I identify prominent levels of coordination activity because stakeholders continue to sustain digital initiatives through formal and informal networks. This reveals persistent multi-level articulation. However, the digital education ecosystem is comprised by fragmented efforts, instead of a shared strategic direction, that assures sustainable system-level capacity.

build this argument through two connected planes of coordination: a cognitive plane of shared meaning and role recognition, and an operational plane of mechanisms, relations and continuity. I constructed this distinction through the integration of the survey and interview strands, while naming it with concepts already present in the coordination literature (Scharpf, 1994; Christensen and Lægreid, 2007; Okhuysen and Bechky, 2009). Section 5.1 presents the integrated survey structure and joint display that support this distinction. The following sections then examine how cognitive weakness becomes operational fragility, before considering counter-patterns and synthesising the chapter's contribution.

5.1 From five-dimensions to two planes of coordination

The survey provides the starting point, as it can give us a more general picture. The results show an asymmetry in how stakeholders perceive coordination across my analytic framework. I found two distinct and interrelated categories. The two lowest items in the whole instrument are the existence of shared objectives (D1_1) and clearly assigned coordination responsibilities (D2_2), both at a median of 2. The operational dimensions show higher agreement with the statements, as mechanisms show a median of 4 (D3), and multi-level coordination and uncertainty management of 5 (D4, D5). Activity is strongly recognised, but the direction is not. The same gap holds respondent by respondent: comparing each person's cognitive score with their operational score, most fall above zero, as seen in Figure 2 below.

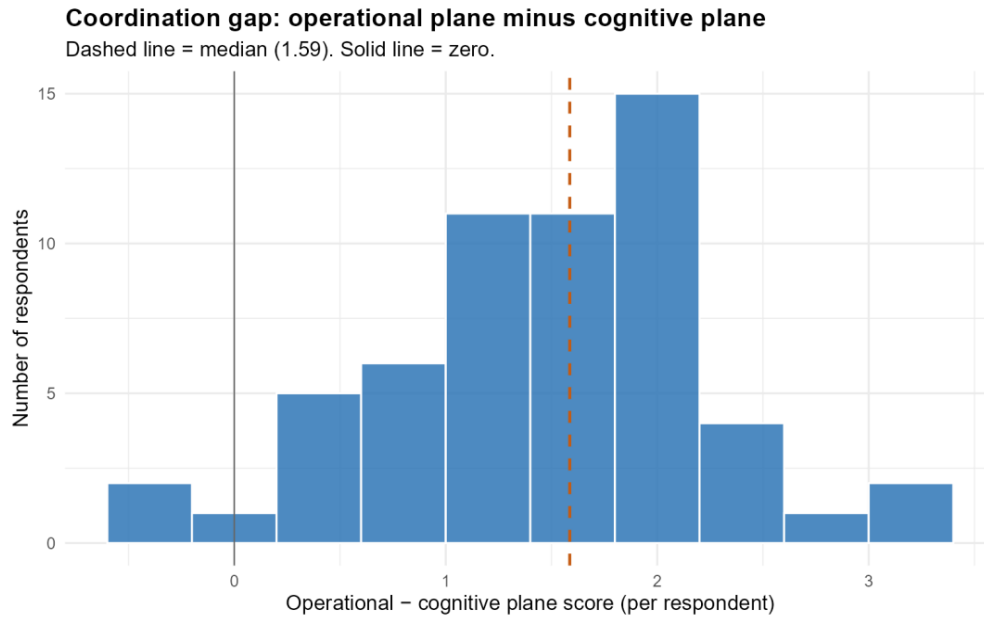


Figure 2 - Respondent-level gap between operational and cognitive dimensions.

The internal structure of the survey reinforces this reading. D1 has the highest respondent concordance (Kendall's $W = 0.666$, $p < 0.001$) and strong internal consistency ($\alpha = 0.847$). This means that actors, beside perceiving low levels of shared understanding, they also agree that it is low. D2 shows a milder version of the same agreement around role ambiguity. D3 behaves differently though, as it presents high median, yet its internal consistency collapses ($\alpha = 0.065$), so its items do not form one scale. I treat D3 as a hinge, so that mechanisms are recognised, but their meaning, authority and force pull in different directions.

The correlation analysis gives this interpretation further support. Shared understanding and role clarity are moderately related to each other, while remaining only weakly associated to the operational dimensions. Recognising that mechanisms exist, or that coordination across levels is necessary, does not necessarily imply that actors share a strategic direction or recognise a clear coordinating role. In respondents' perceptions, the cognitive and operational planes are therefore partially separated.

Surprisingly, exploratory between-group comparisons did not detect statistically significant differences across sector, role, experience, or involvement. Given the sample size and uneven

distribution across categories, this does not support a population-level claim. However, this means the cognitive weakness does not belong to specific positions in the education system, a point I return to in Section 5.5 because it overturned what I expected to find.

The joint display sets this structure beside the interview material. It shows how survey patterns complement and initiate integrated findings (Appendix K).

I read the joint display as separating the five coordination dimensions into two analytic planes. Mechanisms appear in the operational plane, but their effectiveness depends on cognitive foundations. So, operational coordination can be visible while remaining “fragile”:

“Fragmented and fragile system. Fragmented because there is no north star. And since there is no north star, the little sticks that hold the issue up, there is even private enterprise, if the private firm’s focus changes, the project collapses and there is no more. It is a very fragile system of resources, of timelines, of political matters. I would venture to say it is not sustained if there are no actors there mobilising it at full tilt.”

This opinion is key to coming from a civil society participant involved in digital policy leadership. The focus and emphasis of fragility is considerable. However, this participant does not describe a field without movement. Projects exist, actors mobilise, private firms participate and initiatives are carried forward. The problem is the foundation on which digital education initiatives rest. The image of “little sticks” suggests a system that is propped up. The “north star” names the missing cognitive anchor through which actors could share a common objective, understand their roles and attach their work to a broader systematic purpose. Without that anchor, operational mechanisms can function but hold by “little sticks”. These sticks seem to be personal leadership, those actors moving at “full tilt”.

The extract also points to a power relation within this fragility. Across interviews, I identified a common perception that civil society leads the digital education policy steering when public agencies are not present. But here, private actors appear as central to their work. In a weakly steered system, public coordination is not strong enough to make those initiatives less dependent on private priorities. Non-state actors help sustain activity but cannot yet provide

an alternative that ‘holds the base’ for a durable common anchor. So, fragility points to a dependance on provisional support. This integrated finding supports the rest of the chapter.

5.2 Cognitive plane

5.2.1 The missing anticipatory role and shared narrative

As shown in 5.1, D1 recorded the lowest median in the survey and the strongest respondent concordance. This means respondents converged around a coherent perception that shared understanding is weak.

I came across participant’s repeatedly describing weak shared understanding through similar vocabulary such as vision, diagnosis, roadmap, “north” and narrative. I suggest the missing ‘piece’ is the ability to define what digital and AI transformation should do for education, and conversely, how should education aid the wider sociotechnical transformation.

A senior participant with experience in state-steering roles in digital education framed this weakness as a failure of anticipation

“I think that anticipatory role is the role in crisis, because more than an articulation of public investment or private initiative, what we lack today is a vision. Where are the challenges of using technology to solve the most severe problem of the education system? And we have no mobilisation of that vision that would let the private, academic, non-governmental, public effort have a goal, an energetic content around articulation. A shared scenario, a shared narrative.”

The lack of ‘anticipation’, or planning, in the face of rapid change, can be explained by a missing “narrative”. Both strategic direction and shared educational meanings seem to be linked to translate into the lack of ‘energy’, or of sufficient incentives that would allow articulation.

This points to a missing orientation that could build a sense in the fragmented efforts. Plurality is treated as an inherent, and positive, part of the system, which was common across

positions. A higher-education actor connected the same issue to “institutional silos” and the lack of a definition of where Chilean education is heading. I therefore read the missing shared narrative as a field-level weakness.

This is also where the state’s role becomes important as the author of a shared direction. In a system already shaped by distance-steering and evaluative governance, digital and AI education policy risks becoming another space where actors move, but without a settled public narrative about its educational purpose.

5.2.2 Coordination without mandate.

The missing narrative, lead us to the missing author. Here, role clarity adds a different angle. In the survey, D2 occupied an intermediate position, with a median of 3 and significant respondent concordance. The weakest item is the clear assignment of coordination responsibilities. The item on overlapping mandates also produced the highest “Don’t know” response in the survey. This could be a signal that part of the field cannot see the obstructions that some actors report, due to missing the coordinating role itself in a heterarchical system. School-level participants often described their own projects or areas of work, while not really building on their place in the wider policy architecture.

P08, speaking from inside the public unit associated with digital coordination, gave the institutional version of the same absence:

“I think the absence of that coordinating role. Of someone that does not depend only on wills. That should not be there should be a much stronger, fixed backing. There should be a unit that exists by regulation that there be an institutional architecture that tells you: right, there is a unit in charge of digital transformation, and by mandate it must coordinate with these institutions.”

The phrase “does not depend only on wills” shows the need for an institutionally secured coordination, while calling for a “fixed” backing, considering the actor positionality, points towards the importance of a formal mandate in the institutional architecture of digital

education. Role clarity then is linked to legitimate public authority to coordinate across boundaries. This matters for digital and AI education governance because the field cuts across curriculum, infrastructure, data, teacher development, procurement, innovation policy, and private provision. So, this lack of mandate makes the public institutions in charge a backed leadership to deal with the complexity of an ecosystem that transcends even national boundaries. So, acquiring a similar architecture of the system it should coordinate, hold up by “little sticks”.

However, this must be treated reflexively given the actor’s and my own positionality. This makes me attentive to the coordinating role as taking an institutional form.

5.2.3 Narratives and the problem of translation

The cognitive weakness has an edge the survey could not reach. An actor in the technical-education portfolio recast the difficulty as a matter of language:

The educational language is very different from the language of technological development, of the productive world, of industry, and they must converse and do not necessarily have devices that allow translation between the different languages.

The deficit is semantic, and it points to a possible cause and consequence of the issues of coordination. In these times, actors are not short of data. They are short of shared meaning, and of the "devices" that would let the educational register and the technical or productive register translate into each other. So, connecting to that missing interdependent link between education and sociotechnical transformation.

That has a consequence an EdTech-consultancy actor named with rare bluntness:

There is an affliction of saying that we are collaborating, but in the end, we are not collaborating. The co-participatory workshops that were never participatory. We deceive ourselves with concepts we like but do not really apply.

Ambiguity can therefore become performative cooperation. Actors and educational communities may be invited into policy spaces without gaining influence over the decisions that matter. Collaboration remains available as a word, a format and a source of legitimacy, while the practical meaning of participation stays thin.

A foundation actor extended this mechanism by describing how agreements made in collaborative spaces can be used selectively, even when the spaces themselves are well-intentioned. Conclusions arising from collaboration have limited force over public decision-making. At the same time, they can still produce legitimacy for the actors who participate in them. Non-state actors may then draw on the language of agreement, alignment or participation to strengthen their own position, without being bound to a shared educational direction.

This complicates the benefits of decentralised innovation. Plural participation can bring knowledge, resources and experimentation into the education system, as recognized by stakeholders. However, digital education is a diverse, fast-moving field, open to competing interests. In the absence of a central narrative and a recognised coordinating mandate, actors are left to interpret collaboration through their own institutional priorities, and so policy actors enter the same space while attaching different meanings to the same concepts.

5.3 Dilution and the operational plane

The cognitive plane showed a missing narrative and a missing author. On the operational plane the problem changes shape. Here mechanisms are not scarce, they are dense, but density is not the same as capacity. I read the operational plane through one recurring pattern, which I call dilution: coordination that begins with energy and dissolves before it settles into something durable. The survey already pointed here, since the operational dimensions score high while their internal structure stays uneven. The interviews show the forms this dilution takes.

5.3.1 Mechanisms accumulate without aggregating.

I begin with mechanisms because D3 is ambiguous in the survey. Its median is high (median = 4), yet its internal consistency collapses ($\alpha = 0.065$), so the items do not hold together as one scale. I read this as heterogeneity inside the dimension. Formal mechanisms sit lower and more dispersed, while informal interaction and repeated engagement receive steadier evaluations. Respondents seem to separate mechanisms as formal structures from coordination as relational practice. An AI-policy actor named that separation from the inside:

“Today the articulation I see is an articulation at a non-strategic level, one of going through the motions. And it leads to it not permeating decisions that at least for me are strategic. Therefore, it is a coordination that, while well-intentioned, lacks relevance, visibility, impact, on a phenomenon that is systemic. Most cases are hugely delegated to the IT area, the data-science area, the more academic area.”

This actors’ role is linked to national development and education, at the verge of technological innovation. The phrase “going through the motions” points to mechanisms that run without touching the decisions that matter. And “well-intentioned” matters too, because the problem is not effort or corrupted institutions. It is strategic permeability. Articulation happens, but it does not enter the spaces where priorities, resources and mandates are set. The closing line adds a second reading. A phenomenon the participant calls systemic is handed to IT, data science, or academic units. I read this as technicalisation: digital and AI issues treated as a specialist niche, even though they cut across educational spaces, such as curriculum, pedagogy, infrastructure, data, procurement and governance. So, this is where mechanisms accumulate without aggregating. The field builds spaces, tools and agreements, but they do not become an architecture able to steer the further steps that the country needs from the educational system to improve its own technological capabilities. Without the shared narrative and the mandate, the cognitive plane found missing, mechanisms are visible enough to register in the survey, and too loose to hold up more than “little sticks”.

5.3.2 On (un)productive heterogeneity

The second feature is actor plurality. In the survey, D4 recorded the highest median (median = 5), with especially strong agreement that coordination across national, regional and local levels is necessary. Yet D4 showed no significant concordance as a dimension. I read this tension as telling: the need for multi-level coordination is strongly recognised, while the experience of how it works stays uneven. The interviews give the plurality a concrete shape, since actors enter digital education from very different points an academic participant explained the effect through innovation policy:

“Many of those actors do not know they are constructing policy. For instance, the CORFO actors, in boosting a maths startup, do not ask themselves whether what is needed is to raise maths. That is, very simply, because the point is placed elsewhere. What there is a logic of knowing whether that can be a scalable startup. In that sense, very uncoordinated.”

This suggests that digital education governance is also shaped outside education-policy spaces. CORFO, Chile’s public economic-development agency for innovation, entrepreneurship and productive development, can fund actors whose work later enters schools, even when the organising logic is scalability rather than educational need, because they “do not know they are constructing policy”. This adds a concrete mechanism to the cognitive weakness described above. Participants argued that digital education initiatives depend on private actors for continuity. Here, the state funding that could strengthen public coordination, or that could help by aiming at educational needs, may reach private actors whose objectives could sit outside the education system’s priorities.

The maths-startup example captures the gap. From an education standpoint, the question is whether an initiative responds to a learning problem, but from an entrepreneurial standpoint, whether it can scale. Both logics have value, but they organise policy differently. The semantic gap described in 5.2.3 therefore reappears operationally as plurality without translation. Actors contribute to the same digital transformation while the educational purpose connecting their contributions remains unsettled. In a field already shaped by market-mediated adoption, coordination becomes the work of joining initiatives designed from different starting points.

5.3.3 Schools as accumulation points

This unproductive plurality becomes most visible at the school level. The strong survey agreement on multi-level coordination has a concrete meaning at the school, the point that must absorb what ministries, agencies, firms and foundations design elsewhere. A participant, using school-improvement language captured it through an image familiar in Chilean debates:

“There is in the language of the PME improvement programmes a truly clear image, which is the school’s Christmas tree, where different things are hung on the school, different projects, like a Christmas tree with many little lights. Those projects are above all objectives and interests held by other systems: the world of politics, the world of work, the world of the economy. But which tell it, ‘You work too’.”

The speaker’s position matters here. This is a national-level actor working at the intersection of ICT and education policy, so the metaphor comes from someone used to seeing how system agendas travel before reaching schools. The Christmas tree gives a telling metaphor. The school becomes the place where projects, priorities and expectations are hung by other systems.

The reference to the “world of work” and the “world of the economy” adds an important layer. It suggests a productivist rationale for digital education, where schools are asked to serve labour-market, innovation and economic-development agendas. “You work too”, they become a school-level problem.

I try to be careful because I am critical of reducing education to productive needs. Analytically, though, the point is that even this productivist rationale appears weakly organised. It mobilises the language of digital transformation, future skills and AI readiness, while failing to consolidate a stable plan for how education should relate to those goals. As with CORFO, different “worlds” ask different things from education: politics seeks visibility, the economy seeks productivity, the labour market seeks skills, technology actors seek adoption. Projects arrive with urgency, each carrying its own origin and promise, while their connection to long-term educational capacity remains thin.

Dilution, here, means the education system is asked to absorb digital transformation without a settled account of what that transformation is meant to build.

5.3.4 Personalised networks as informal coordination infrastructure

The operational plane also runs on informal relationships. Inside D3, the items on informal interaction and repeated engagement are the steadier ones (median = 4), which suggests respondents recognise relational coordination even where formal mechanisms are judged unevenly.

“My impression is that the educational ecosystem is very closed, very based on prior relationships. So, there are figures that are very dominant, everything is very personalistic (...) and projects becoming big happen because these people knew each other for a long time”

The participant speaks from an EdTech startup, from the side of actors expected to innovate, scale and bring technical-pedagogical solutions into schools. I found this interesting as the EdTech ecosystem, often presented through a language of plural innovation and productive modernisation, is described from within as closed, personalistic and uneven.

“Projects becoming big” tells me that initiatives scale through more than technical quality, educational value or formal procedures. They also move through trust, recognition and accumulated relational capital. In a regulatory state like Chile, these personal networks become part of the coordination infrastructure and certainly help keep the system together. But it also creates traps for smaller or less connected actors.

I read this pattern reflexively because my own access to senior participants also moved partly through relational channels. I treated the theme as credible because it recurred across market, foundation and academic participants. Informal networks help hold the field together, while it may reproduce its fragility and unequal access.

5.4.5 Temporal fragility and political attention decay

The last feature is temporal, and it draws the operational plane together. In the survey, respondents agreed strongly that political transitions raise coordination demands, and that long-term work needs mechanisms beyond political cycles. This was among the clearest consensuses in the instrument, which makes sense, since infrastructure, data systems, teacher preparation and curriculum change all need time to accumulate. A senior state-steering actor traced how that time is lost:

“For the first meeting of the working groups authorities attend. But from then on, the State’s priorities are dictated by political contingency. So, making that data-governance working group, which is not something people march in the streets about, its priority keeps declining, until it is left to the officials who are typically the most interested. In the end we end up in meetings of the IT manager of the Superintendency with the IT manager of the Ministry. And then the IT managers send their deputy, and then they send their third-in-line, and that is it. Until the working group dies.”

This is what “diluted” operations essentially mean, and I interpret that as the consequence of the system’s fragility overtime. Coordination stays formally alive while losing rank, authority and strategic force: authorities give way to managers, managers to deputies, deputies to “third-in-line”. The phrase “not something people march in the streets about” explains part of the decay. The quiet technical work that sustains digital transformation has little public salience, in comparison with the historical demands on Chile’s student movement, so political contingency erodes it first.

The quote also points beyond the political cycle. What keeps the group alive is eventually the presence of “the officials who are typically the most interested”. D5 records a perceived need for uncertainty management, but the interview material shows how that management often rests on “energized”, “motivated” and “full tilt” actors to carry the work. Continuity depends on political periods, then on the person who remains, and then on that person’s motivation. This is where the temporal dynamic meets the personal one. The “little sticks” holding the operational plane up are often persons.

The same reliance that lets a working group die can keep a school project alive when the person in charge happens to be favourable. A school-level participant described exactly that, an initiative sustained because the sostenedor was, in their words, a lover of technology. Same mechanism, opposite outcome. So, coordination in this system is only as durable as the person currently willing to carry it, a term often coined as “voluntaristic”. Read across the education system, this is an equity concern as much as an administrative one, since whether a school sustains a digital initiative can turn on the disposition of a single sostenedor, or on a regional leader, or the president of said period.

For now, individual will do the work a mandate should do.

5.4 Counter-patterns

The first is AI as a window. An AI-policy actor reported that, unlike other agendas, AI coordination had survived the last political transition without being politicised, placing it as "outside the logic that other subjects have with the change of agenda". Lower politicisation may open room to coordinate. It may also just reflect how early and thinly institutionalised the AI agenda still is across the education system. A window, then, that I cannot assume yet as a property of the education system.

The second finding concerns public judgement in relation to technological novelty and private provision. When referring to AI adoption in an institution, a participant described resisting pressure to adopt a specific AI solution:

“I had a lot of pressure (...) and I had to defend calm. The paid tool does not let you skip that process, and you are only preparing for that paid tool which will be obsolete in six months. So, I think you must invest in more than the technology; you must invest in the preparation of people.”

I interpret this as a moment of public steering. The participant does not reject AI; they question the pace and terms of adoption. The phrase “defend calm” is important because it presents coordination as a temporal judgement. Slowing down procurement to protect educational

purpose, institutional learning, and human capacity. This complicates a simple story of private-sector influence. Actors can evaluate, delay, and redirect technological pressure when they have enough authority and judgement to do so. However, it is also clear that they are pressured, which talks about the power dynamics described earlier.

The third counter-pattern appears at the territorial level. One participant described an unexpected concentration of programming specialisms in Ñuble:

“It really struck me that the Ñuble region, which is a new region, has five establishments with a programming specialism. And it seems that the regional governor four years ago decided that Ñuble was going to become a technology hub, because there is a lot of rurality and the kids leave. Well, things like that were done in Uruguay, you know, but 20 years ago, and it has borne fruit.”

I read this as a case of local strategic anchoring. Digital education is connected here to territorial development, youth retention, and regional opportunity. The example matters because it shows that direction does not have to be produced nationally, and it can also emerge subnationally when local leadership links skills, technology, and development into a coherent narrative. "Things like that were done in Uruguay, but twenty years ago, and it has borne fruit". Direction, here, came from below. Two things follow. Anchoring can be done, through a legal mandate, a considered judgement, or regional leadership. And where it appears it still rests on the same fragile supports, a particular official, a window, a governor. What the field lacks is precisely what actors seem to identify in Uruguay and constant mentioning of Plan Ceibal in particular, as a role model. Direction, mandate and continuity held by an institution rather than a person.

5.5 Integrated synthesis and scope of findings

Ultimately my analysis describes coordination as active, plural and weakly cumulative. I can now answer the two questions that opened the study.

The first, asked how key stakeholders perceive coordination capacity. They perceive it as uneven, and uneven in a patterned way. Actors recognise the need to coordinate across levels, sectors and time, and describe a busy sub-governance field of digital education. But they perceive the cognitive foundations weakly. Coordination capacity, splits into two planes, an active operational plane, and a cognitive plane seen transversally weak. The perception is not that nothing happens. Actors see activity, but activity resting on “little sticks” and lacking the “north star”, or the mandate, narrative and alignment with other digital areas, able to pull efforts together.

RQ2 asked what the enacted coordination dynamics reveal about the governance configuration. Here the forms of dilution gather. Mechanisms accumulate without aggregating; plurality runs without translation; schools absorb what other systems design; personal networks carry what mandates do not; and continuity depends on individual leadership, or motivational factors. In Chile’s education system, these dynamics of coordination reveal a configuration in which the articulating function is real but blurred. Someone convenes, someone sustains, someone carries the work. In a field shaped by the regulated autonomy of an evaluative state, that function has drifted toward articulators, brokers and de facto disseminators of policy who may hold no educational mandate, no public accountability, or no guaranteed continuity. So, the field coordinates without a coordinator. I name this pattern here as it surfaces in the data, a heterarchy whose anchoring function has no institutional home, and I read it theoretically in Chapter 6.

One survey result shaped the findings. I expected perceptions to vary by position, as if the state would see one thing and private or civil-society actors another. The data refused that. It found no significant differences across sector, role or experience. The sample is small and purposive, and both instruments have limits. Some actors may have read me through the UNESCO process; the short Likert-scale survey may also have shaped what respondents could say. Still, the result was productive. It moved my reading from coordination fragmentation as a clash of interests toward fragmentation as a shared condition, a field where actors from different vantage points name the same absence. This reading took shape through integration between the strands, making the mixed methods design central to the analysis.

These findings offer an analytical interpretation of coordination dynamics within the ecosystem studied. The survey rests on 58 responses from an elite sample weighted toward senior, experienced, Metropolitan-Region actors. The interviews give depth from strategically located participants across the system's levels, while leaving the full territorial, school and classroom range underrepresented. The reading is also reflexive. My proximity to the field shaped what I attended to, and I treated that closeness as an analytic resource with risks attached, checking each interpretation against patterns across both strands. The convergence between the survey structure and the interview accounts gives me confidence in the diagnosis, while keeping its scope clear.

6. Discussion

This thesis asked how actors across Chile's digital and AI education system perceive coordination capacity, and what enacted coordination dynamics reveal about the country's governance configuration. The findings answered both questions. Coordination is active, plural and weakly cumulative: dense on an operational plane, weak but convergent on a cognitive one, and only loosely joined across the two. This chapter reads that pattern as three theoretical contributions and one methodological contribution. It specifies coordination capacity as a two-plane structure, names the governance configuration displayed by the Chilean case, rereads coordination as a possible boundary object, and reflects on the value of mixed-methods integration for studying heterarchical governance.

The distinction between a cognitive register of shared meaning and an operational register of mechanisms is present in public governance coordination literature. As Chapter 2 set out, it runs from Scharpf's work on coordination and actor constellations (1994, 1997), through Christensen and Lægreid's account of post-NPM coordination (2007), to Okhuysen and Bechky's treatment of coordination mechanisms in organisational settings (2009). What I contribute is both a simple name to them, and the demonstration that, in a heterarchical digital education field, these registers behave as two planes whose uneven development is itself a

property of capacity. Consequently, the naming of the configuration this produces, and the boundary-object reading.

6.1 Coordination capacity as a two-plane structure

The first contribution specifies coordination capacity as a two-plane structure, as emerging from the parallel constructs' analysis my analytic framework. Chapter 2 treats Coordination Capacity, with Benz (2019) and Dose (2019), as the ability to manage interdependencies under complexity, the Chilean evidence adds a contribution. The ability to manage interdependencies depends both on whether mechanisms exist, and on whether the cognitive foundations that let them aggregate have been jointly produced. If the cognitive side, lacks a shared meaning across actors who enact diverse and plural policy fields, coordination can exist, but it might not accumulate into stable a public direction.

This is what the interviews establish. The senior accounts cannot name a shared direction, oftenly describing the anticipatory role of the digital education ecosystem as "in crisis", and without a "north". In education-governance terms, the centre is present through programmes, funding and evaluation, but weaker as a system organiser. It can activate instruments and audit activity, while the principles guiding digital education, and its link with digital transformation at large, remain thin.

The operational plane tells the opposite story; working tables, agreements and continuity efforts that participants describe readily and often value, such as UNESCO's. These are the visible mechanisms through which the digitalisation of education moves across levels of the system. The survey supports this reading, as both planes behave differently in the data, and are not correlated in any measurement. The finding lies in that separation. Coordination instruments circulate, but the metagovernance role remains weak. No stable actor clearly holds the work of connecting digital infrastructure, data systems, teacher development, curriculum, procurement and school-level implementation into a common educational project. The figures are reported in the findings chapter; here they help confirm the pattern the qualitative analysis had already made visible.

The operational plane presents a very high level of activity, and that is what makes the lack of strategic anchoring more striking. In fact, the Chilean State has built a digital-government strategy (Ley 21.180, 2019), a long-horizon Estrategia Chile Digital 2035, a Política Nacional de Inteligencia Artificial with an education side, data-protection legislation safeguarding pupils (Ley 21.719), and, in the CIM, a technical-pedagogical actor with three decades of experience. This is what the Marco de Acción para la Transformación Digital de la Educación (UNESCO & MINEDUC, 2025) catalogues as the country's "relevant assets." The two-plane reading explains why such density still produces weak capacity. The Chilean state has not retreated but reconfigured, as Villalobos et al., 2024 also showed. My study adds its strong presence on the operational plane as funder, market-maker and convenor while failing to give it a coherent educational purpose and system direction.

This specifies Scharpf's distinction in the Chilean case. Negative coordination can operate through coexistence, alignment and avoidance of open conflict; the field has enough mechanisms for that. Positive coordination requires a stronger cognitive plane: actors need shared meanings, recognized roles and a common account of what digital transformation should build for education, and vice versa. The problem lies in the missing institutional location for joint interpretation. Shared direction does not arise from interaction alone. It has to be produced, authorized and sustained somewhere in the governance architecture.

This is the substance behind RQ1. Stakeholders perceive capacity as split: an operational life they can see and often value, resting on a cognitive foundation they broadly describe as weak. Coordination capacity, in this reading, is cognitive-institutional as well as operational. It depends on mechanisms, but also on the public work of giving those mechanisms direction, mandate and educational meaning.

6.2 Heterarchy without a strategic anchor in Chile's market-oriented system

The anchor function is performed, but by actors without public mandate, accountability or continuity.

This is the configuration RQ2 asks the enacted dynamics to reveal, and the second contribution names it: a heterarchy without a strategic anchor. The field has the structure of a heterarchy, distributed, overlapping authority across the ministry, the Centro de Innovación, SUBTEL, CORFO, schools and their sostenedores, EdTech firms, foundations and international organisations. What it lacks is the institutional function through which dispersed activity is oriented toward field-level purposes no single actor controls.

Stark's (2009) account locates the gap. Heterarchies can be productive because competing evaluative principles create friction that clarifies what actors value. But that productivity rests on a recognition condition. Actors have to see one another's frames as legitimate positions within a shared field. In the Chilean case actors move from different logics. Education, innovation, productivity, technology, territorial development, etc. Is here where the field lacks a common frame through which those differences can become alternatives to be debated. In Jessop's terms, the missing function is metagovernance: the governance of governance (2004). One international-organisation participant captured this through the image of an *orquesta sin director*. The instruments are present and playing, but the conducting function has no institutional home.

This converges with the closest precedent, then extends it. Villalobos et al. (2024), working from cultural political economy, independently describe a "poorly coordinated network" in which the ministry is "one actor among many". My study reaches the same configuration through stakeholder perceptions and enacted coordination dynamics. It adds the cognitive explanation of why the network fails to aggregate: actors recognise activity, but lack a shared diagnosis, narrative and coordinating mandate. It also adds the institutional account of where the anchoring function has gone: into dispersed public officials, intermediaries, private actors and personal networks that can perform articulation without being able to hold public strategic direction.

The comparison with higher education shows that the gap is institutional, not a general incapacity of the Chilean state. Alarcón and Brunner (2024) show that, after the 2018 reforms, the state re-centralised as regulator, evaluator and funder, building mandated institutions and performing what they, following Gjaltema et al. (2020), call a system-designer or metagovernance role. The same state leaves that function undelegated in school-level and system-wide digital and AI governance.

The difference is where the coordinating function is located. Higher education received a legislative reform that gave institutional form to coordination. Digital education followed another path: from Enlaces as a public provider to the Centro de Innovación as a facilitator that convenes public and private actors (Claro and Jara, 2020), with no comparable mandate. The multilevel structure deepens the problem. Higher education is organised mainly at a national level, while the school system is dispersed through school choice, sostenedor-level purchasing and market-mediated provision. The vacuum therefore appears most sharply where authority is already most fragmented.

That vacuum is produced by Chile's inherited market architecture. Three decades of voucher funding, the Subvención Escolar Preferencial, school-level purchasing autonomy and a subsidiary state distributed authority by design (Bellei, 2015; Parcerisa and Falabella, 2017). Villalobos et al. (2024) show the EdTech network expanding precisely because purchasing sits at school level and the state withdrew from direct provision. Digital and AI objects therefore enter a field already organised for dispersed, market-mediated adoption.

This sharpens the central claim. The articulating function has partly migrated to private and intermediary actors. Villalobos et al. (2024) document EdTech firms as “articulators and administrators”, a trade association as a “symbolic articulator”, and foundations as brokers convening the ministry, municipalities and Big Tech. Innovation and export agencies appear “close” to industry, while the ministry appears as “a world apart”. The anchor function is being performed, but by actors without public mandate, accountability or guaranteed continuity. This matches the account from inside the public coordinating role: the function “is

not mandated by any law”. Heterarchy without a strategic anchor names this displacement: articulation exists, while public strategic direction has no secure institutional home.

The gap is institutional, and this reframes the design problem. Participants diverged on the form a coordinating function should take, yet converged on the need for public strategic provision. The official policy framework reaches the same diagnosis from inside policy: the Marco de Acción describes “clear intentions and relevant assets”, while also identifying the absence of “sectoral leadership, strategic planning and institutional articulation” and of an institution “with the mandate and resources to coordinate” (Ministerio de Educación de Chile and UNESCO, 2025). The convergence matters because the policy framework names the same institutional absence my data led me to identify. Since I took part in that process, I treat the document as corroborating a finding derived from my own data, rather than as its source, a reflexive point I return to in Section 6.6.

The demand for an anchor is overdetermined. From a competitiveness register, Chile faces digital and AI transformation as a question of growth, human-capital formation and productive development; structural-transformation scholarship frames this as a coordination problem because markets alone cannot supply the required institutional capacity (Juhász, Lane and Rodrik, 2024). From a humanistic register, the same transformation raises concerns about AI, data, equity and human dignity, from human-development theory (Sen, 1999; Kleine, 2010) to Magnifica Humanitas (2026). These registers were framed in Chapter 2 as competing visions of digital education. Here they converge on the same institutional implication. A more anticipatory public role. The cognitive-plane absence is the capacity both horizons require. Importantly, Chile has its own history of state-led, sovereignty-oriented technological projects, notable Cybersyn (Medina, 2014). This challenges the vision that technological development must be subjected to private providers.

The strongest test of this reading comes from the cases where anchoring did appear, which I sought deliberately as counter-patterns. An AI-policy actor described AI as less politicised

than earlier agendas. This illustrates the role currently assumed by CENIA as leading AI transformation.

An actor described resisting pressure from providers and authorities to adopt a specific AI tool. In the findings this read as a counter-pattern, a moment where public judgement slowed technological pressure. In the discussion it exposes the sharper risk of a heterarchy without a strategic anchor. When the coordinating function has no institutional home, this allows private pressure towards public policy, which rests on one official's capacity to hold the line, and if that judgement falters, adoption moves through provider pressure and modernisation discourse before pedagogical value, equity or data protection. Pedagogical gains from AI depend on the logic around the tool, an unstructured use tends to produce cognitive offloading and weaker higher-order reasoning rather than deeper learning (Fan et al., 2025). Adoption, on its own, does not teach.

The pandemic already showed that technology is a necessary but not sufficient condition for learning continuity, and that what carried systems through the shock was not the device but a functioning public architecture of financing, staffing and governance (World Bank, 2024). A system that leans on private tools without a public anchor may look modern while becoming, in fact, less resilient to the next disruption, more dependent on infrastructures it does not steer. This is why participants' repeated appeals to Plan Ceibal matter. They invoke Uruguay as an anchored public model, and its lesson is institutional rather than technological: access alone did not secure learning, and what mattered was the consistency and coherence of public policy over time. The point holds for Chile. Public anchoring must organise pedagogy, equity and continuity together, not adoption alone.

6.3 Coordination as a polysemic boundary object

The third contribution works at the level of the central concept. Across the interviews, “coordination” names different things: formal working groups, informal exchange, mutual visibility, joint mandate, vertical cascade, horizontal alignment, public-private negotiation and

continuity across cycles. I treat this polysemy as an empirical feature of the field. Coordination behaves like what Star and Griesemer (1989) call a boundary object, a stable enough concept to travel across communities, flexible enough to mean different things within each. This echoes Villalobos et al.'s (2024) point that EdTech is a polysemic field that can take on different meanings and functions. Here, the polysemy reaches the organising concept itself.

That matters because actors can converge around coordination as a desirable word while diverging over what it should require. Its content remains loose enough for different actors to claim it, while the disagreement appears when coordination has to be specified: who leads, who decides, who is accountable, what counts as participation, and what should be sustained. An EdTech-consultancy actor named the dynamic clearly: there is “a habit of saying that we are collaborating”. The declarative claim survives because sharing the word does not require sharing its institutional meaning.

I am careful about how far to push this. Star and Griesemer use boundary objects to explain cooperation across difference. The Chilean case suggests a more cautionary function. The same flexibility can sustain the appearance of agreement while leaving deeper divergence untouched, feeding the two-plane logic. I offer this as a tentative extension. The firmer point is methodological. Declarative measures of coordination can overstate convergence. Reading survey breadth against interview depth allowed the polysemy to appear as a finding.

For implementation theory, this matters because coordination is itself a policy object actors interpret from their position (Honig, 2006; Spillane et al., 2002). Instruments built around “coordination” will be enacted differently if the term is left underspecified. A ministry may hear mandate, a firm may hear partnership, a school may hear implementation burden, and an intermediary may hear convening space. The same word can organise interaction while leaving the work of translation undone.

There is also a political-economy edge. Leaving the articulating function underspecified can protect the private and intermediary actors who have come to perform it, as Section 6.2 argued with Villalobos et al. (2024). I hold this as a reading that needs further research.

6.4 Implications for digital, platform, and AI education governance

First, additional coordination mechanisms might have limited value on its own. They currently do not translate into a cohesive policy structure that can give a stable and coherent direction to digital education initiatives across Chile's education system. The *Marco de Acción* offers an operational architecture, while also naming the absence of an institution “with the mandate and resources to coordinate” (Ministerio de Educación de Chile and UNESCO, 2025).

Second, a successful leading policy architecture needs clear mandates that can allow the exercise of authority within the education system, in order to articulate across curriculum, infrastructure, data, procurement, teacher development, school implementation and private provision. Strengthening the articulator function means giving it mandate, accountability and continuity.

Third, platform power is also a coordination-capacity problem. Platforms shape standards, data flows, procurement and dependency. Education systems cannot govern the interdependencies that are not clear among distributed actors. With digital procurement made by schools and weak public anchoring, engagement with Big Tech risks making public systems fall into a relation of digital dependency with platforms located transnationally. This provides profound sovereignty concerns to national democracies.

Fourth, temporal volatility is part of the field. Administrative cycles are shorter than implementation cycles, and technological change moves faster than institutional adaptation. The interviews showed coordination spaces losing authority as attention moved on, until continuity rested on interested officials. Chile needs a public function able to hold time: institutional memory, technical capacity and protection from short political cycles.

Fifth, digital education sits between the digital sociotechnical transformation and human development. From economics, education is central to skills, innovation and human-capital formation. From humanism, it is where dignity, agency, democratic participation and equity become concrete. If Chile wants to develop national capabilities, it needs a public anchor able to connect digital transformation to an educational and developmental purpose.

The AI agenda sharpens all six implications. Promises around AI often move faster than evidence, while data, dependency, pedagogy and sovereignty questions remain unresolved beneath adoption (Selwyn, 2024; Sriprakash et al., 2024). On the partial evidence of this study, AI may open a coordination window. It may also intensify the risks of a field that can adopt faster than it can steer.

6.5 Generic patterns, digital-specific objects

The configuration is wider than digital education. Convergence on a missing diagnosis, mechanism plurality without architecture, and continuity that decays with attention are features of heterarchical coordination where authority is distributed (Parcerisa and Falabella, 2017; Avelar, 2025). But the objects the education system govern are fairly new, such as platforms, data systems and Big Tech relationships bring new demands. These are cross-border data governance, algorithmic oversight, fast technological change and dependence on infrastructures whose logics exceed national jurisdiction (Komljenovic, 2021; van Dijck, 2020). When these objects enter a field with weak strategic anchoring, and so broad as the education systems, inherited fragility and new high-complexity technical demands make it more difficult to deal with.

This also sets the scope of the claim. In a centralised or single-provider system, or in one with a mandated convener, the anchoring function is institutionally located by design. Operational density is then less likely to decouple from direction, although it may have the costs of lower innovation. Beyond Chile, the two planes could be used to map operational density, then ask whether a cognitive-anchoring function is institutionally located. Capacity lies in the relation between the planes, rather than in the presence of mechanisms alone.

6.6 Contribution, reflexivity, and limitations

The contribution adds to the findings of two studies in education governance in Chile, and the addition is also methodological. Alarcón and Brunner (2024), with interviews and documents, and Villalobos et al. (2024), with interviews and startup databases and policy databases, both map structures and actors, but neither captures actor perceptions or the polysemy of coordination itself. The convergent and actor-centred perception-based design developed here, survey breadth read against interview depth, integrated through a joint display, is what makes the boundary object visible and specifies the cognitive mechanism behind the poorly coordinated network they document.

I make these claims as an interpretation of a policy field, and it is not generalisable account of Chilean education. The survey rests on 58 analytic responses from an elite sample concentrated among senior, experienced, Metropolitan-Region actors, and the between-group comparisons found no significant differences, so that absence is consistent with, but does not prove, a field-level condition. 18 interviews give depth from strategically located participants but not the territorial or school-level diversity of the system, and the analysis works at the level of the field rather than its implementation in schools.

The reading is also reflexive. Two parts of my trajectory shaped it. I took part in the consultative process behind the *Marco de Acción*, and earlier in student mobilisations that argued for education as a right rather than a consumption good. Both experiences attuned me to the absence of a public anchoring function; in a real sense, I was listening for it. Those commitments could also have led me to treat absence as failure, or market-mediated coordination as illegitimate before analysing how it works. I guarded against this by framing the finding institutionally. The issue is the absence of a mandated location for the anchoring function. I also checked the interpretation against the survey's independent convergence, generated before I coded the interviews. My position is therefore part of the analysis, with its risks named.

The discussion answers both research questions. Stakeholders perceive coordination capacity in digital education system as split between two planes: an operational plane they recognise,

and a cognitive plane they judge as weak (RQ1). The enacted dynamics show how that split works in practice. In short, mechanisms accumulate without aggregating, plurality runs without translation, and continuity rests too often on individual will. Together, these dynamics reveal a configuration in which the articulating function is performed but institutionally ownerless (RQ2). This is the thesis's central contribution: a heterarchy without a strategic anchor, where coordination is carried by actors who cannot hold public direction across political cycles, due to the same dependence on personal leadership, and by a concept flexible enough to travel across the field while leaving its meaning unsettled.

7. Conclusion

Chile's digital and AI education governance is active but weakly cumulative. My evidence shows the existence of plentiful mechanisms that take care of articulation and provision of digital education initiatives. The missing piece is an institutional location where dispersed coordination can become shared direction. This is the central conclusion, and it reframes a problem usually framed as deficit of coordination activity. The problem is architectural: where is the work of producing a common diagnosis and an anticipatory horizon done, by whom, and with what mandate? The study set out to understand how actors perceive coordination capacity, and what enacted coordination dynamics reveal about the governance configuration. What they reveal is a field that recognises coordination, performs it densely, and struggles to make it cumulative.

This matters beyond Chile because it changes what we should count as coordination capacity. In a heterarchical field, density (i.e. many actors, many mechanisms) could be assumed as capacity, which problems could be solved by more policy spaces. The two-plane reading shows why this might not be sufficient. Operational density and strategic capacity are distinct properties of the digital education system. A field can be rich in mechanisms while remaining weak in shared meaning. Capacity lies in the relation between the planes, and whether mechanisms are connected to a shared diagnosis, a recognised mandate and a public horizon.

Chile shows this. A market-oriented education system shaped by regulated autonomy, sostenedor-level purchasing and steering at a distance, an expanding EdTech ecosystem, and a state that often works as funder, evaluator and market-maker more than system organiser. Digital and AI objects, with increasing complexity, now enter an institutional architecture that was not aimed to fill the new governance needs these create. This is the configuration I have named a heterarchy without a strategic anchor.

For Chilean policy, what follows from this thesis is a stronger institutionalisation of an anchoring function. A public body, with legal mandate, accountability and continuity across administrations, that can hold an anticipatory vision, and articulating role across the public, private and intermediary actors. An institution that can also move beyond education, to respond efficiently to the broader needs of digital transformation.

Two points can be inferred. First, engagement with platform providers needs a shared public-interest frame on data, interoperability and dependency before further procurement decisions are made. Second, continuity also has to be designed at field level, since it currently rests too heavily on personal efforts. The state does not need to return to direct provision to do this, but it could occupy the strategic plane, or the work of metagovernance, or system design, that gives direction to a plural field.

Several questions remain open. Future studies could build on the two-plane structure. Explore whether it applies to other Latin American education systems with distributed authority and strong EdTech sectors, such as Brazil and Mexico (Avelar and Ball, 2019). They could also follow whether the anchoring function becomes institutionally located. A separate study should examine AI specifically, since one participant suggested that this agenda may be less politicised and governed through different coordination dynamics. Finally, future research could apply this perception-based mixed-methods design to other heterarchical fields, such as health, environmental governance or inter-ministerial digital reform, to test the validity and applicability of this framework.

The Chilean case is, in the end, a story of governance reconfiguration. The state remains present through funding, convening, evaluation, infrastructure and technical-pedagogical support, while the strategic plane remains weakly held. That absence is especially consequential now because platformisation, datafication and AI raise demands of macroeconomic competitiveness and ethical concerns at once, and both require a more anticipatory public role. In a system long inclined to treat education as a private good, rather than a public right, the question of who anchors digital transformation is inseparable from the question of whose purposes it serves. The instruments are present and playing. Whether Chile gives them a conductor, and through what institutional form, is the question the next decade of its digital education policy will have to answer.

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Appendices

Appendix A: Interview Guide in English.

Interview

Note: This document was translated to Spanish to share with participants in Chile

Interview Questions

This interview explores coordination dynamics in the governance of digital and AI initiatives in education.

We are interested in how coordination takes place in practice, particularly across institutions and actors, and how this is experienced under conditions of uncertainty or change. The interview does not aim to evaluate institutions or technologies.

Phase 1 – Positioning and experience

Entry question (open):

1. What do you understand by articulative coordination efforts in the digital policy field of education?
2. Could you tell me about your role and how you are involved in digital or AI initiatives in education?

Potential follow-ups:

- Types of initiatives
- Coordination spaces you participate in (formal / informal)

Phase 2 – Understanding coordination in practice.

Entry question (open):

2. When you think about digital or AI initiatives in education, how does coordination typically take place in practice?

Potential follow-ups:

- Clarity of objectives

- How roles and responsibilities are defined
- What happens when responsibilities are unclear.
- How and what is the use of formal coordination mechanisms
- Role of informal interaction

Phase 3 – Interaction and interdependence of educational actors.

Entry question (open):

3. How have coordination dynamics evolved over time as actors work together on digital or AI initiatives?

Follow-ups:

- Repeated interactions or main actors involved.
- Learning through experience
- Anticipating other actors' actions
- Adjusting expectations

Phase 4 – Multi-level and cross-sector coordination

Entry question (open):

4. How would you describe coordination across different levels and types of actors involved in these initiatives?

Follow-ups:

- National / regional / local coordination
- Differences in institutional priorities
- Role of external actors (private sector, foundations, IOs) – depends on who is interviewed.
- How coordination is managed across sectors

Phase 5 – Uncertainty, timing, and continuity.

Entry question (open):

5. How does uncertainty or change shape coordination around digital or AI initiatives?

Follow-up prompts:

- Policy or political transitions

- Short-term vs long-term pressures
- Strategies to maintain continuity.
- Continuous technological change.

Phase 6 – Forward-looking insights.

Entry question (open):

6. From your perspective, what makes coordination particularly demanding in the context of digital and AI initiatives in education?

Follow-ups:

- Differences across sectors or regions
- What would most help improve coordination going forward?

Appendix B: Survey instrument

You are invited to participate in a research study conducted as part of a master's thesis at the University of Glasgow. The purpose of this survey is to examine key stakeholders' perceptions of coordination dynamics in the governance of digital transformation and AI in Chile's education system.

The survey focuses on institutional coordination, leadership, digital and data readiness, and does not collect personal or sensitive information. Your participation is entirely voluntary. The survey is aimed at professionals working in public institutions, educational organisations, civil society, the private sector, and international organisations linked to education policy, governance, or digital transformation.

Completing this survey will take approximately 10 minutes.

Participant information and privacy.

Before deciding whether you wish to participate, please review the following documents:

Participant Information Sheet: Explains the purpose of the study, what your participation involves, and your rights as a participant.

Privacy Notice: Explains how your data will be collected, stored, anonymised, and used in accordance with University of Glasgow policies and applicable data protection regulations.

[Hyperlink to the Participant Information Sheet.](#)

[Hyperlink to the Privacy Notice.](#)

End of block: Introduction

Start of block: Consent

Consent

You have read the Participant Information Sheet and the Privacy Notice and agree to participate in this study.

☐ Yes, I agree to participate. (1)

☐ No, I do not agree to participate. (2)

End of block: Consent

Start of block: Instructions

Instructions

Before responding, we ask you to consider coordination around digitalisation and AI initiatives in the Chilean education system from your professional experience and in relation to the actors and institutions with which you usually interact, for example, MINEDUC, regional services/authorities, school providers, schools/liceos, providers, foundations, and international organisations.

In this study, “coordination” refers to the processes through which different actors and institutions articulate and align objectives, roles, and actions in order to manage interdependencies and advance towards common goals in Chile.

In the following sections, you will find statements organised by topic. Please indicate your level of agreement using the scale provided.

There are no right or wrong answers. If you do not have enough information or if the topic does not apply to your role, you may select “Do not know / Not applicable”.

Scale:

1 = Strongly disagree

2 = Disagree

3 = Neither agree nor disagree

4 = Agree

5 = Strongly agree

N/A = Do not know / Not applicable

End of block: Instructions

Start of block: Perceptions of Coordination

Shared Understanding and Strategic Alignment

The following statements refer to the existence of shared objectives and strategic coherence around digitalisation and AI in education.

1 = Strongly disagree (1)

2 = Disagree (2)

3 = Neither agree nor disagree (3)

4 = Agree (4)

5 = Strongly agree (5)

N/A = Do not know / Not applicable (0)

There is a shared understanding of the objectives of digital and AI initiatives. (1A_1)

Digital and AI initiatives are aligned with national priorities. (1A_2)

Expectations regarding these initiatives are clearly communicated across institutions. (1A_3)

Clarity of Roles and Responsibilities

The following statements refer to how roles and responsibilities are distributed and understood among the actors involved.

1 = Strongly disagree (1)

2 = Disagree (2)

3 = Neither agree nor disagree (3)

4 = Agree (4)

5 = Strongly agree (5)

N/A = Do not know / Not applicable (0)

Roles and responsibilities are clearly defined. (1B_1)

Coordination responsibilities for initiatives are clearly assigned. (1B_2)

There are overlapping mandates that require constant coordination. (1B_3)

Coordination Mechanisms

The following statements refer to the mechanisms and dynamics through which coordination among actors is articulated.

1 = Strongly disagree (1)

2 = Disagree (2)

3 = Neither agree nor disagree (3)

4 = Agree (4)

5 = Strongly agree (5)

N/A = Do not know / Not applicable (0)

Coordination depends mainly on formal mechanisms. (1C_1)

Informal interaction plays an important role in coordination. (1C_2)

Coordination improves through repeated interaction among actors. (1C_3)

Multilevel and Multisectoral Coordination

The following statements refer to the articulation between different levels of government and sectors involved in the governance of digitalisation and AI initiatives.

1 = Strongly disagree (1)

2 = Disagree (2)

3 = Neither agree nor disagree (3)

4 = Agree (4)

5 = Strongly agree (5)

N/A = Do not know / Not applicable (0)

Coordination between national, regional, and local levels is necessary. (1D_1)

Institutional differences increase the need for coordination. (1D_2)

External actors play a relevant role in coordination. (1D_3)

Uncertainty and Temporal Dynamics

The following statements refer to how political, institutional, or strategic changes influence coordination.

1 = Strongly disagree (1)

2 = Disagree (2)

3 = Neither agree nor disagree (3)

4 = Agree (4)

5 = Strongly agree (5)

N/A = Do not know / Not applicable (0)

Political transitions increase coordination demands. (1E_1)

Long-term initiatives require mechanisms that go beyond political cycles. (1E_2)

Future uncertainty affects current coordination. (1E_3)

Coordination is central to digital and AI governance. (1E_4)

Addressing coordination challenges is key to sustainability. (1E_5)

End of block: Perceptions of Coordination

Start of block: Institutional Profile

Main institutional affiliation

- o Ministry of Education – National level (1)
- o Ministry of Education – Regional/local level (2)
- o Ministry of Science / Digital Government / ICT (3)
- o Ministry of Finance / Economy (4)
- o National Statistics Institute (5)
- o Higher Education Institution (6)
- o Technical-Professional Education Institution (7)
- o Public school (8)
- o Private school (9)
- o Civil society organisation / NGO (10)
- o Private sector: EdTech, telecommunications, consulting (11)
- o Big Tech (12)
- o Research institute / Think tank (13)
- o Independent consultant (14)
- o Civil society / NGO (15)
- o Private sector (16)
- o Academia / Research (17)
- o International organisation (18)
- o Other (19)

Region where you mainly work

- ☐ Arica and Parinacota (1)
- ☐ Tarapacá (2)
- ☐ Antofagasta (3)
- ☐ Atacama (4)
- ☐ Coquimbo (5)
- ☐ Valparaíso (6)
- ☐ Metropolitan Region of Santiago (7)
- ☐ O'Higgins (8)
- ☐ Maule (9)
- ☐ Ñuble (10)
- ☐ Biobío (11)
- ☐ La Araucanía (12)
- ☐ Los Ríos (13)
- ☐ Los Lagos (14)
- ☐ Aysén (15)
- ☐ Magallanes (16)
- ☐ I work at the national level (17)

Current role

- ☐ Senior leadership (1)
- ☐ Middle management (2)
- ☐ Technical professional (3)
- ☐ School leader (4)
- ☐ Teacher (5)
- ☐ Researcher (6)

- ☐ Consultant (7)
- ☐ Other (8)

Years of professional experience

- ☐ Less than 3 years (1)
- ☐ 3–7 years (2)
- ☐ 8–15 years (3)
- ☐ More than 15 years (4)

Level of involvement in digital or AI initiatives

- ☐ None (1)
- ☐ Low (2)
- ☐ Moderate (3)
- ☐ High (4)
- ☐ I lead or coordinate initiatives (5)

End of block: Institutional Profile

Start of block: Follow-up Interview

Interview

Would you like to be contacted for a follow-up interview? If you decide to participate in a follow-up interview, you will be redirected to a separate form where you may provide your contact details. These will not be linked to your responses in this survey.

- ☐ Yes (1)
- ☐ No (2)

Appendix C: Qualtrics' examples of visual layout



Se le invita a participar en un estudio de investigación realizado como parte de una tesis de maestría en la Universidad de Glasgow. El propósito de esta encuesta es examinar las percepciones de actores clave sobre las dinámicas de coordinación en la gobernanza para la transformación digital y de la IA en el sistema educativo de Chile.

La encuesta se centra en la coordinación institucional, el liderazgo, la preparación digital y de datos, y no recopila información personal o sensible. Su participación es totalmente voluntaria. La encuesta está dirigida a profesionales que trabajan en instituciones públicas, organizaciones educativas, la sociedad civil, el sector privado y organismos internacionales vinculados a la política educativa, la gobernanza o la transformación digital.

Completar esta encuesta le tomará aproximadamente 10 minutos.

Información del participante y privacidad.

Antes de decidir si desea participar, por favor revise los siguientes documentos:

1. Hoja de Información para el Participante: Explica el propósito del estudio, en qué consiste su participación y sus derechos como participante.
2. Aviso de Privacidad: Explica cómo se recopilarán, almacenarán, anonimizarán y utilizarán sus datos de acuerdo con las políticas de la Universidad de Glasgow y las regulaciones de protección de datos aplicables.

[Hervínculo a la Hoja de Información para el Participante.](#)

[Hervínculo al Aviso de Privacidad](#)



Consentimiento. Usted ha leído la hoja de información para el participante y el aviso de privacidad y acepta participar en este estudio.

☐ Sí, acepto participar.

☐

☐ No, no acepto participar.

☐

Instrucciones

Antes de responder, le pedimos que considere la coordinación en torno a las iniciativas de digitalización e IA en el sistema educativo chileno desde su experiencia profesional y en relación con los actores e instituciones con los que usted interactúa habitualmente (p. ej., MINEDUC, servicios/autoridades regionales, sostenedores, escuelas/liceos, proveedores, fundaciones, organismos internacionales).

En el presente estudio, 'coordinación' se refiere a los procesos mediante los cuales distintos actores e instituciones articulan y alinean objetivos, roles y acciones para gestionar interdependencias y avanzar hacia metas comunes en Chile.

En las siguientes secciones encontrará afirmaciones organizadas por temática. Por favor indique su nivel de acuerdo utilizando la escala proporcionada.

No hay respuestas correctas o incorrectas. Si no cuenta con información suficiente o el tema no aplica a su rol, puede seleccionar "No sabe / No aplica".

Escala:

1 = Totalmente en desacuerdo

2 = En desacuerdo

3 = Ni de acuerdo ni en desacuerdo

4 = De acuerdo

5 = Totalmente de acuerdo

N/A = No sabe / No aplica



1. Comprensión Compartida y Alineación Estratégica:

Las siguientes afirmaciones se refieren a la existencia de objetivos compartidos y coherencia estratégica en torno a la digitalización e IA en educación.

	1 = Totalmente en desacuerdo	2 = En desacuerdo	3 = Ni de acuerdo ni en desacuerdo	4 = De acuerdo	5 = Totalmente de acuerdo	N/A = No sabe / No aplica
1. Existe una comprensión compartida sobre los objetivos de las iniciativas digitales y de IA.	☐	☐	☐	☐	☐	☐
2. Las iniciativas digitales y de IA están alineadas con prioridades nacionales.	☐	☐	☐	☐	☐	☐
3. Las expectativas sobre estas iniciativas se comunican claramente entre instituciones.	☐	☐	☐	☐	☐	☐

Listo

2. Claridad de Roles y Responsabilidades:

Las siguientes afirmaciones se refieren a cómo se distribuyen y entienden los roles y responsabilidades entre los actores involucrados.

	1 = Totalmente en desacuerdo	2 = En desacuerdo	3 = Ni de acuerdo ni en desacuerdo	4 = De acuerdo	5 = Totalmente de acuerdo	N/A = No sabe / No aplica
4. Los roles y responsabilidades están claramente definidos.	☐	☐	☐	☐	☐	☐
5. Las responsabilidades de coordinación de las iniciativas están claramente asignadas.	☐	☐	☐	☐	☐	☐
6. Existen mandatos superpuestos que requieren coordinación constante.	☐	☐	☐	☐	☐	☐

Listo

3. Mecanismos de Coordinación:

Las siguientes afirmaciones se refieren a los mecanismos y dinámicas mediante los cuales se articula la coordinación entre actores.

	1 = Totalmente en desacuerdo	2 = En desacuerdo	3 = Ni de acuerdo ni en desacuerdo	4 = De acuerdo	5 = Totalmente de acuerdo	N/A = No sabe / No aplica
7. La coordinación depende principalmente de mecanismos formales.	☐	☐	☐	☐	☐	☐
8. La interacción informal juega un rol importante en la coordinación.	☐	☐	☐	☐	☐	☐
9. La coordinación mejora con la interacción repetida entre actores.	☐	☐	☐	☐	☐	☐

Listo

4. Coordinación Multinivel y Multisectorial:

Las siguientes afirmaciones se refieren a la articulación entre distintos niveles de gobierno y sectores involucrados en la gobernanza de iniciativas de digitalización e IA

	1 = Totalmente en desacuerdo	2 = En desacuerdo	3 = Ni de acuerdo ni en desacuerdo	4 = De acuerdo	5 = Totalmente de acuerdo	N/A = No sabe / No aplica
10. La coordinación entre niveles nacional, regional y local es necesaria.	☐	☐	☐	☐	☐	☐
11. Las diferencias institucionales aumentan la necesidad de coordinación.	☐	☐	☐	☐	☐	☐
12. Los actores externos juegan un rol relevante en la coordinación.	☐	☐	☐	☐	☐	☐

5. Incertidumbre y Dinámica Temporal

Las siguientes afirmaciones se refieren a cómo los cambios políticos, institucionales o estratégicos influyen en la coordinación.

	1 = Totalmente en desacuerdo	2 = En desacuerdo	3 = Ni de acuerdo ni en desacuerdo	4 = De acuerdo	5 = Totalmente de acuerdo	N/A = No sabe / No aplica
13. Las transiciones políticas aumentan las demandas de coordinación.	☐	☐	☐	☐	☐	☐
14. Las iniciativas de largo plazo requieren mecanismos más allá de ciclos políticos.	☐	☐	☐	☐	☐	☐
15. La incertidumbre futura afecta la coordinación actual.	☐	☐	☐	☐	☐	☐
16. La coordinación es central en la gobernanza digital y de IA.	☐	☐	☐	☐	☐	☐
17. Abordar desafíos de coordinación es clave para la sostenibilidad.	☐	☐	☐	☐	☐	☐

Afiliación institucional principal

Ministerio de Educación – Nivel nacional	☐
Ministerio de Educación – Nivel regional/local	☐
Ministerio de Ciencia / Gobierno Digital / TIC	☐
Ministerio de Hacienda / Economía	☐
Instituto Nacional de Estadísticas	☐
Institución de Educación Superior	☐
Institución de Educación Técnico-Profesional (TP)	☐
Escuela pública	☐
Escuela privada	☐
Organización de la sociedad civil / ONG	☐
Sector privado (EdTech, telecomunicaciones, consultoría)	☐
Big Tech	☐
Instituto de investigación / Centro de estudios (Think Tank)	☐
Consultor/a independiente	☐
Sociedad civil / ONG	☐
Sector privado	☐
Academia / Investigación	☐
Organización internacional	☐
Otro	☐

Entrevista. ¿Desea ser contactado/a para una entrevista de seguimiento?
Si decide participar en una entrevista de seguimiento, será redirigido a
un formulario independiente donde podrá proporcionar sus datos de
contacto. Estos no estarán vinculados a sus respuestas en esta encuesta.

Si	☐
No	☐



Appendix D: Qualtric's interview follow-up

Gracias por su interés en participar en una entrevista de seguimiento.
Esta encuesta es independiente de la encuesta principal.
Sus datos de contacto no estarán vinculados a sus respuestas anteriores.

Nombre completo

Correo electrónico a contactar

Organización

Appendix E: Follow-up interview in English

Thank you for your interest in participating in a follow-up interview.

This survey is independent from the main survey.

Your contact details will not be linked to your previous responses.

Full name:

Email address to contact:

Organisation:

Appendix F: Survey sample composition

Table F.1. Sector distribution of the analytic sample

Sector	n	%
Central government	15	25.9
Subnational / school level	9	15.5
International organisation	9	15.5
Civil society	8	13.8
Academia	7	12.1
Private sector	5	8.6
Other	5	8.6
Total	58	100.0

Table F.2. Geographical distribution of the analytic sample

Region / scope	n	%
Metropolitan Region of Santiago	47	81.0
National level	5	8.6
Ñuble	1	1.7
Biobío	1	1.7
La Araucanía	1	1.7
Tarapacá	1	1.7
Valparaíso	1	1.7
O'Higgins	1	1.7
Total	58	100

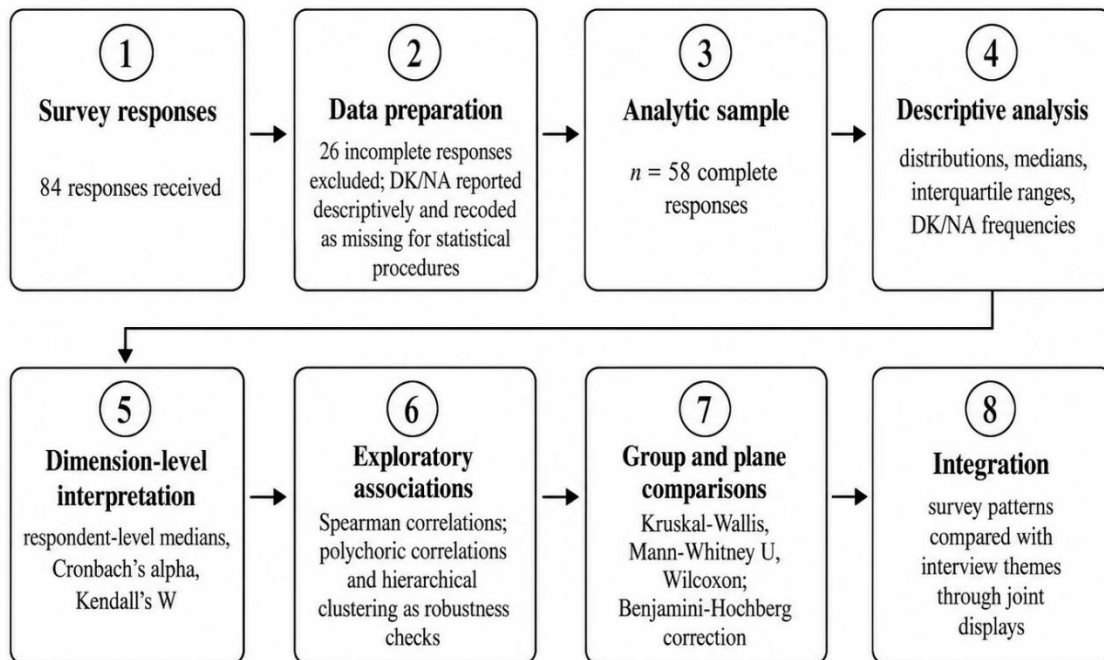
Table F.3. Years of professional experience

Experience	n	%
6–10 years	5	8.6
11–15 years	10	17.2
More than 15 years	43	74.1
Total	58	100.0

Table F.4. Level of involvement in digital and AI education initiatives

Level of involvement	n	%
Not involved	1	1.7
Slightly involved	4	6.9
Moderately involved	14	24.1
Highly involved	17	29.3
Leading or coordinating initiatives	22	37.9
Total	58	100.0

Quantitative strand: data preparation and analytical sequence

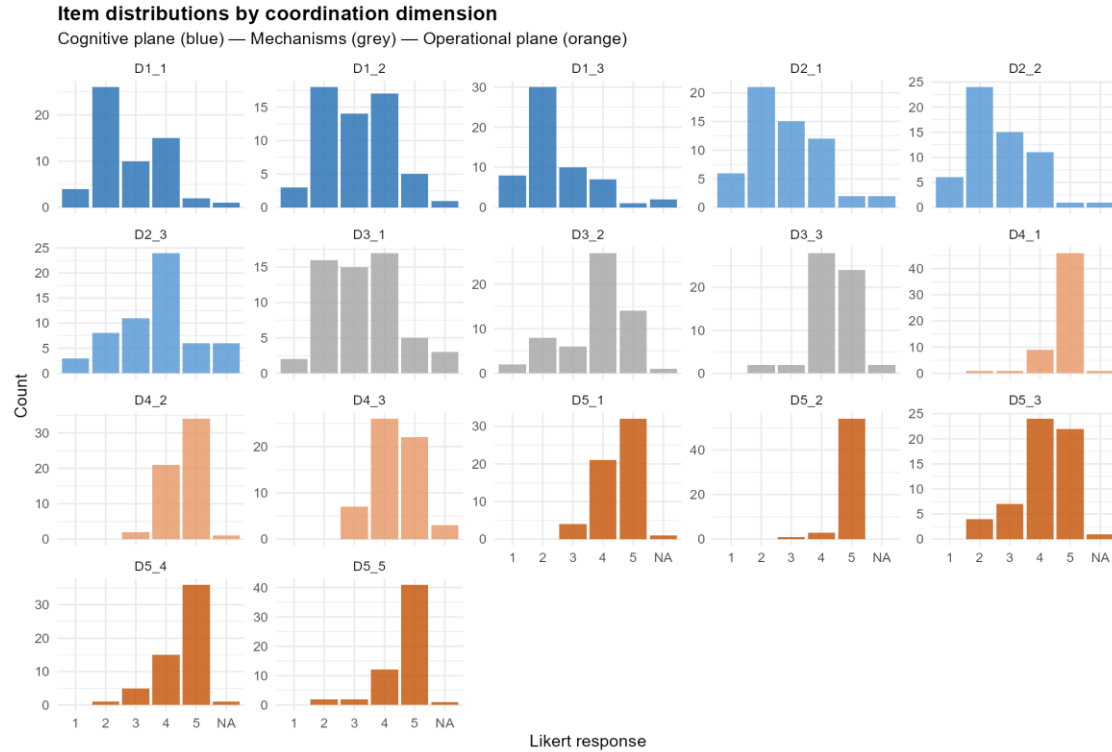


Source: Author's elaboration.

Appendix H: Quantitative Technical Output

H.1 Item-level descriptive statistics

Item	N	DK/NA	% DK/NA	M	SD	Mdn	IQR
D1_1	57	1	1.7	2.74	1.04	2	2
D1_2	57	1	1.7	3.05	1.09	3	2
D1_3	56	2	3.4	2.34	0.94	2	1
D2_1	56	2	3.4	2.7	1.04	3	1.25
D2_2	57	1	1.7	2.6	0.98	2	1
D2_3	52	6	10.3	3.42	1.07	4	1
D3_1	55	3	5.2	3.13	1.06	3	2
D3_2	57	1	1.7	3.75	1.09	4	1
D3_3	56	2	3.4	4.32	0.72	4	1
D4_1	57	1	1.7	4.75	0.58	5	0
D4_2	57	1	1.7	4.56	0.57	5	1
D4_3	55	3	5.2	4.27	0.68	4	1
D5_1	57	1	1.7	4.49	0.63	5	1
D5_2	58	0	0.0	4.91	0.34	5	0
D5_3	57	1	1.7	4.12	0.89	4	1
D5_4	57	1	1.7	4.51	0.73	5	1
D5_5	57	1	1.7	4.61	0.73	5	1



H.2 Dimension-level descriptive statistics

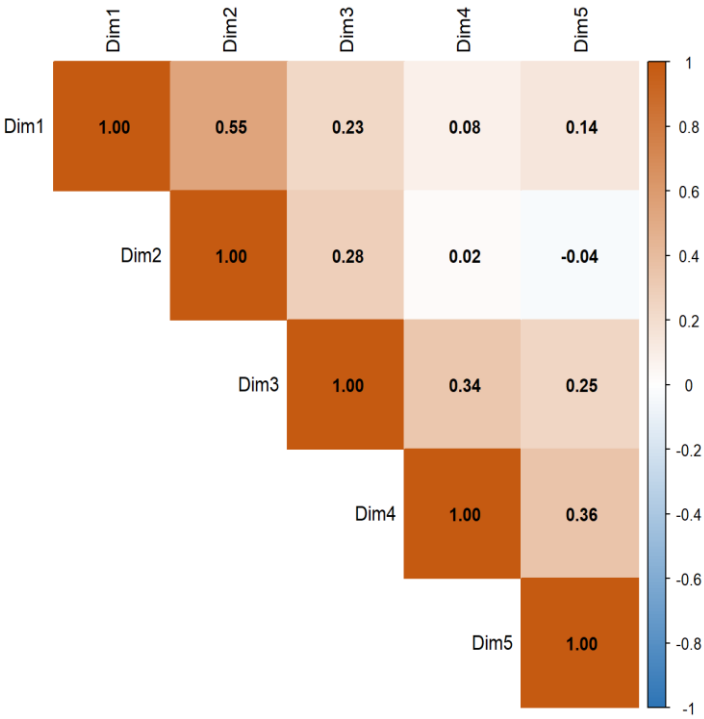
Dimension	N	M	SD	Mdn	IQR
D1 Shared understanding	58	2.71	0.99	2	1.75
D2 Role clarity	57	2.71	1	3	2
D3 Coordination mechanisms	57	4.02	0.69	4	0
D4 Multi-level & cross-sector	57	4.61	0.56	5	1
D5 Uncertainty management	58	4.66	0.58	5	1

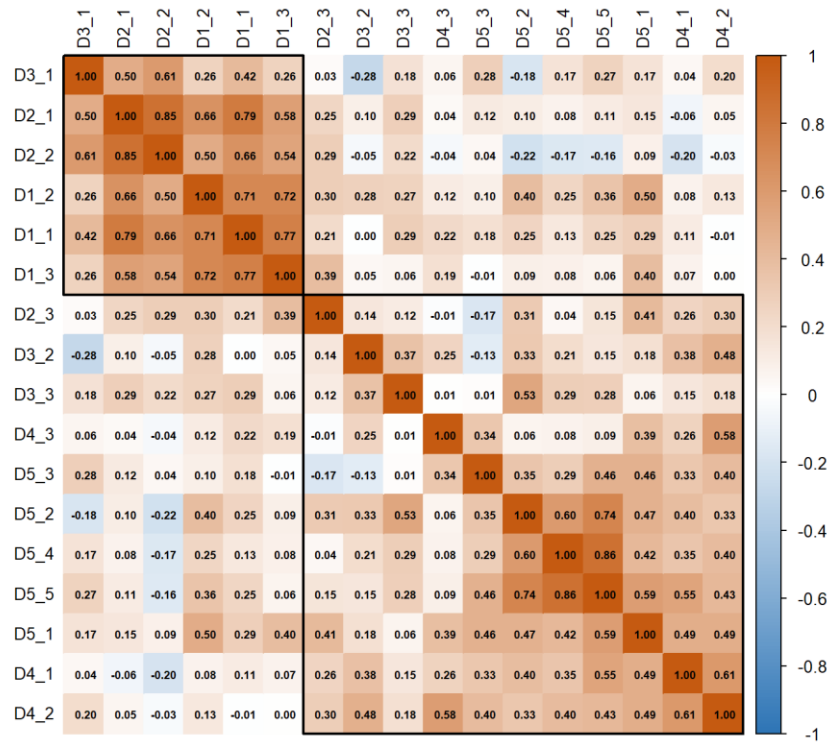
H.3 Within-dimension concordance (Kendall's W)

Dimension	W	p	Significance
D1 Shared understanding	0.666	< .001	p < .001
D2 Role clarity	0.555	.002	p < .01
D3 Coordination mechanisms	0.312	.606	n.s.
D4 Multi-level & cross-sector	0.384	.208	n.s.
D5 Uncertainty management	0.312	.005	p < .01

H.4 Between-dimension correlations

	D1	D2	D3	D4	D5
D1	1.00	.55	.23	.08	.14
D2	.55	1.00	.28	.02	−.04
D3	.23	.28	1.00	.34	.25
D4	.08	.02	.34	1.00	.36
D5	.14	−.04	.25	.36	1.00

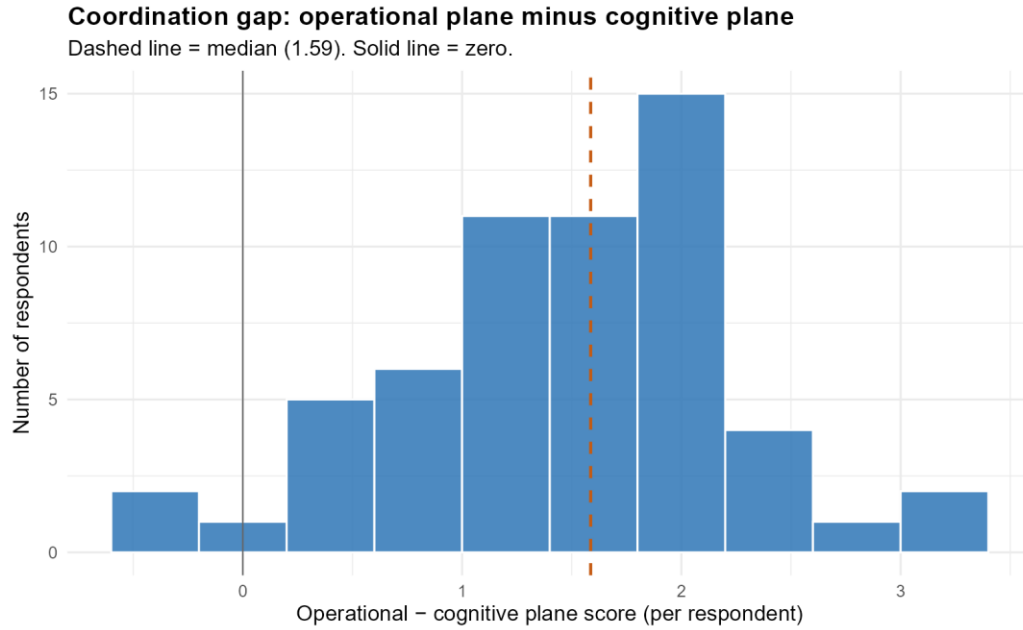




Item-level polychoric correlation heat-map. Shows two-planes.

H.5 The respondent-level coordination gap

Statistic	Value
Wilcoxon V	1706
p-value	2.33×10^{-11}
Pseudo-median difference	1.53
95% CI lower bound	1.356
Median gap	1.59
IQR of gap	0.93
Respondents operational > cognitive	96.6%
Respondents operational < cognitive	3.4%



H.6 Between-group comparisons (the null result)

Dimension	H	df	p
D1 Shared understanding	5.399	6	.494
D2 Role clarity	8.467	6	.206
D3 Coordination mechanisms	3.157	6	.789
D4 Multi-level & cross-sector	6.941	6	.326
D5 Uncertainty management	1.954	6	.924

H.7 Respondent clustering (robustness check)

Cluster	n	%	Cognitive avg	Operational avg	Gap
1 — Uniformly pessimistic	9	15.5	1.96	3.85	1.89
2 — Dominant two-plane	27	46.6	2.49	4.42	1.93
3 — Moderately positive, two-plane preserved	22	37.9	3.56	4.41	0.85

H.8 Decomposition of the mechanisms dimension (D3)

Item	Mdn	IQR	Patterns with	Reading
D3_1	3	2	Cognitive (D1/D2)	Mechanism clarity / definition
D3_2	4	1	Operational (D4/D5)	Mechanism functioning
D3_3	4	1	Operational (D4/D5)	Mechanism utility

Appendix I: Participant Information Sheet in English.



Interview

Participant Information Sheet

Note: This document will be translated to Spanish to share with participants in Chile

Title of project and researcher details

Title: Coordination Dynamics in the Governance of Digital and AI Education Policy in Chile: A Mixed-Methods Convergent Study of Stakeholder Perceptions.

Researcher: Benjamin Espinoza

Supervisor: Dr. Queralta Capsada-Munsech

Course: Erasmus+ Master's GLOBED – Education Policy for Global Development.

You are being invited to take part in a research project about digital transformation and AI governance in Chile's education system.

Before you decide if you want to take part, it is important for you to understand why the research is being done and what it will involve. Please take time to read the information on this page carefully and discuss it with others if you wish. Ask me if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

I hope that this sheet will answer any questions you have about the study.

1. What is the purpose of the study?

The purpose of this study is to explore how key stakeholders perceive coordination in the governance of digital and AI education policy in Chile, including clarity of leadership and strategy, coordination between institutions, governance of data and AI initiatives.

The research contributes to the academic field of political economy of education, political science, digital governance, and AI readiness.

It also seeks to provide insight into governance challenges identified during the UNESCO Digital Transformation Collaborative (DTC) process, in which the researcher previously participated as a consultant. However, this research is conducted independently as part of an academic degree.

2. Why have I been chosen?

You have been invited because you are a professional actor involved in the governance, implementation, or analysis of digital or AI-related policies in Chile's education system.

Your perspective is valuable for understanding alignment, fragmentation, and governance capacity across institutions.

3. Do I have to take part?

No. Participation is entirely voluntary.

If you choose not to take part, nothing will change in your work or relationship with any institution, including the University of Glasgow.

You may withdraw from the study at any time without giving a reason. You may request withdrawal of your identifiable data up to two weeks after the interview has taken place. After this period, the data may have been anonymised and integrated into the analysis, and it may no longer be possible to remove your contribution.

4. What will happen to me if I take part?

If you choose to participate, you may take part in:

A voluntary semi-structured interview

If you volunteer for an interview, I will ask you questions about your professional views on digital and AI governance. You do not need to answer any questions you do not wish to.

Interviews last around 40 minutes and will be conducted on Microsoft Teams.

With your permission, the interview will be audio-recorded, and transcribed using AI tools.

Data collection will be completed by April 2026.

5. Will the information that I give you in this study be kept confidential?

Yes.

All information you provide in the interview will be kept confidential.

- The interview audio and transcript will be pseudonymized, meaning your name and contact details will be stored separately from the interview data.
- A unique participant code (e.g., INT01) will replace personal identifiers in all working files.
- Your interview will be stored securely on University-approved, password-protected systems.
- Only the researcher and dissertation supervisor will have access to the identifiable data.
- When findings are reported (e.g., in quotes), all identifying information will be removed or altered to protect anonymity.

6. What will happen to the results of this study

I will analyse the data I collect from participants, and present this in the dissertation which I am writing for my master's qualification in Erasmus+ Master's GLOBED – Education Policy for Global Development. All participants can request a written summary of the findings.

Identifiable personal data (e.g., names and consent forms) will be securely deleted once they are no longer required for the project and, in any case, no later than completion of the dissertation. Anonymised interview transcripts will be securely stored for the duration of the project and destroyed in accordance with University policy following the award of the degree.

7. Who has reviewed the study?

This study has been reviewed and agreed by the School of Education Ethics Forum, University of Glasgow

8. Who can I contact for further information?

If you have questions or require further information, please contact:

Researcher: Benjamin Rodrigo Espinoza Carrasco

3075807E@student.gla.ac.uk

Supervisor: Dr Queralt Capsada-Munsech

Queralt.Capsada-Munsech@glasgow.ac.uk

School of Education Research Ethics Committee:

education-ethics@glasgow.ac.uk

Appendix J: Consent Form



Consent Form Survey

Note: The document will be translated to Spanish to share with participants in Chile

Title of Project: Coordination Dynamics in the Governance of Digital and AI Education Policy in Chile: A Mixed-Methods Convergent Study of Stakeholder Perceptions.

Name of Researcher: Benjamin Espinoza

Supervisor: Dr. Queralta Capsada-Munsech

Please tick as appropriate

Yes ☐ No ☐ I confirm that I have read and understood the Participant Information Sheet for the above study and have had the opportunity to ask questions.

Yes ☐ No ☐ I understand that my participation is voluntary and that I am free to stop completing the survey at any time before submission. As the survey is anonymous, once responses have been submitted it will not be possible to identify or withdraw my individual data.

I agree that:

Yes ☐ No ☐ I understand that no personally identifiable information is collected as part of this survey.

Yes ☐ No ☐ I understand that anonymised survey data will be stored securely on University of Glasgow systems and will be destroyed in accordance with University policy following completion of the degree.

Yes ☐ No ☐ The material may be used in future publications, both print and online.

Yes ☐ No ☐ I waive my copyright to any data collected as part of this project.

Yes ☐ No ☐ I understand that anonymised findings from this study may be included in academic and professional dissemination outputs.

Yes ☐ No ☐ I acknowledge the provision of a Privacy Notice in relation to this research project.

I agree to take part in this research study ☐

I do not agree to take part in this research study ☐

Name of Participant

Signature Date

Signature Date

Name of Researcher Signature

Date

Appendix K: Joint Display illustration

Dimension (plane)	Survey signal (quantitative)	Deductive theme (framework-led)	Inductive theme (data-led)	Integrated inference
D1 Shared understanding (cognitive)	Median 2 (lowest) W = 0.666; α = 0.847 Weak but convergent	Weak shared understanding and anticipatory role	<i>"No hay norte": absent shared narrative; diagnosis missing across levels</i>	Cognitive weakness is a shared structural condition, not one position's grievance
D2 Role clarity (cognitive)	Median 3; D2_2 = 2 "Don't know" 10.3% on overlapping mandates	Unclear mandates and responsibilities	<i>Articulating role "not mandated by law"; "circumstantial, not organic"</i>	The articulating function is undelegated; part of the field cannot see it
D3 Coordination mechanisms (hinge)	Median 4 but α = 0.065 Items do not cohere as one scale	Mechanisms as thin vs. thick coordination	<i>"Going through the motions": technicalisation; declarative adherence</i>	Mechanisms accumulate without aggregating; dense activity, little strategic force
D4 Multi-level and cross-sector (operational)	Median 5 (need) No dimension concordance Items normatively framed	Multi-level and cross-sector coordination	<i>Árbol de Pascua; actors "do not know they build policy"; saltarse al Estado</i>	Need recognised, enactment uneven; coordination cost displaced downward
D5 Uncertainty and continuity (operational)	Median 5 (need) Consensus on political-cycle fragility	Continuity under uncertainty	<i>"Until the working group dies"; voluntad; personal networks</i>	Dilution in time: coordination only as durable as the person willing to carry it