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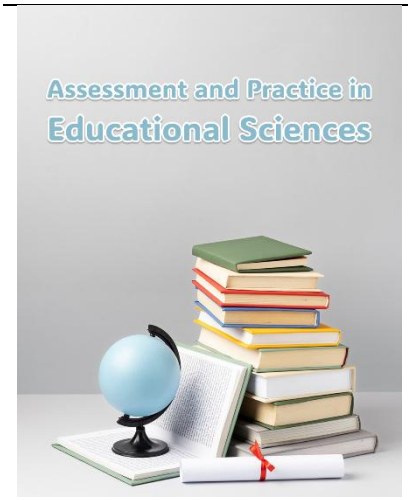

Strategic Thinking Model of Primary School Teachers in Online Education

ABSTRACT

The purpose of this study was to design a strategic thinking model of primary school teachers in online education. The research method was qualitative, based on strategic approaches, and in terms of purpose, it was an applied study. The statistical population consisted of elites and experts in the fields of curriculum planning and educational management who were familiar with the research topic and had successful experience in strategic management. Sampling was conducted using theoretical, judgmental, and purposive sampling methods. Data collection tools included in-depth semi-structured interviews, the researcher's observations, and theoretical foundations, which were collected during the period from Winter 2022 to Spring 2023. Data analysis was performed using open, axial, and selective coding, resulting in the development of a strategic thinking model of primary school teachers in online education. In the strategies section, the category of the online education pathway was extracted, and in the concepts section, the program-oriented category along with the indicators of dynamic planning and achieving cognitive domain objectives in online education were identified.

Keywords: Teachers' insight, strategic model of online education, grounded theory

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Introduction

The digital transformation of education, particularly the shift toward online and blended learning environments, has fundamentally reshaped the role of teachers in designing and delivering instruction. Teachers' strategic thinking and their ability to navigate complex educational contexts have become increasingly crucial as they face rapidly evolving pedagogical, technological, and organizational demands (1). Strategic thinking, as a higher-order cognitive process, involves the capacity to

anticipate future challenges, integrate diverse information, and align instructional decisions with long-term educational goals (2, 3). In the context of online education, this skillset enables teachers to respond adaptively to the challenges of virtual environments, such as student engagement, instructional equity, and digital literacy, while ensuring continuity of learning during crises such as the COVID-19 pandemic (4, 5).

Research emphasizes that the shift to online education has brought to light both opportunities and limitations for teachers. While technology provides avenues for personalization, flexibility, and innovative pedagogy, it also exposes systemic inequalities and workload pressures (6, 7). Teachers must balance cognitive, technical, and managerial demands, requiring a deep understanding of metacognitive processes and critical thinking skills to make informed instructional choices (8, 9). The adoption of online education environments further calls for integrating ethical considerations, social-emotional learning, and adaptive learning strategies to meet the needs of diverse learners (10, 11).

Strategic thinking is inherently connected to teachers' ability to reflect on their practices, engage in foresight, and implement innovative strategies to enhance student outcomes. It encompasses skills such as systems thinking, conceptual thinking, and visioning (12, 13). The literature suggests that teachers who develop these skills are better positioned to manage uncertainty, coordinate collaborative efforts, and achieve instructional alignment between curriculum, assessment, and pedagogy (14, 15). Moreover, the integration of strategic thinking into teacher professional development programs strengthens institutional capacity to foster resilient and future-ready educational systems (16, 17).

The increasing prevalence of digital platforms, virtual reality tools, and adaptive learning systems has further transformed teachers' cognitive demands. Studies exploring the use of immersive technologies report that teachers' perceptions and acceptance of virtual reality can significantly shape their instructional choices, indicating a need for pedagogical frameworks that integrate these tools meaningfully (18). Digital technologies in primary education, such as e-portfolios and interactive content, offer unique opportunities for formative assessment and feedback but also require teachers to rethink their instructional strategies (19). Teachers' anxiety, self-esteem, and critical thinking skills have been shown to mediate their willingness to adopt such technologies, highlighting the psychological dimension of technology adoption (20).

A significant body of literature also explores the motivational and behavioral aspects of teachers' engagement with innovative pedagogies. Motivation to adopt new approaches is shaped by institutional support, access to resources, and perceived usefulness of technology (21, 22). Game-based pedagogy, for example, has been shown to increase engagement and promote collaborative learning, yet its success depends on teachers' readiness and strategic planning capabilities (23). Moreover, vocational and primary school teachers must develop the so-called 4C competencies (critical thinking, creativity, collaboration, and communication) to facilitate 21st-century skill development among students (24, 25). These competencies not only enhance teachers' instructional adaptability but also foster a culture of inquiry and problem-solving in the classroom.

During the COVID-19 pandemic, teachers faced unprecedented challenges in maintaining educational quality and equity, which accelerated research into virtual education models and the development of conceptual frameworks to guide practice (4, 5). Findings indicate that online teaching environments require not just technical solutions but also strategic pedagogical adjustments, including differentiated instruction, equitable access to resources, and attention to students' psychosocial well-being (6, 7). This has led to increased interest in management models that integrate e-learning infrastructure, teacher training, and systematic evaluation mechanisms to support sustainable educational delivery (22).

Strategic intelligence, strategic leadership, and strategic planning are closely interrelated with teachers' capacity for strategic thinking. Evidence from organizational and educational research shows that these dimensions collectively enhance institutional performance and learning outcomes (15, 16). In addition, scenario planning methodologies have been proposed as tools for enhancing teachers' future-oriented thinking, allowing them to anticipate challenges such as technological disruptions and

policy changes (17). Scenario-based approaches foster adaptive decision-making, which is essential in volatile and uncertain educational contexts.

Furthermore, empirical studies underline the mediating role of organizational culture and support mechanisms in promoting teachers' strategic engagement. When educational organizations encourage reflective practice, collaborative problem-solving, and professional autonomy, teachers are more likely to experiment with innovative instructional strategies and sustain change initiatives (1, 21). Conversely, the absence of systemic support and recognition can lead to resistance, professional burnout, and disengagement, underscoring the importance of aligning institutional policies with teachers' needs (5, 10).

In summary, the literature demonstrates that strategic thinking among teachers is a multifaceted construct influenced by cognitive, organizational, and technological factors. It not only shapes instructional effectiveness but also serves as a driver for educational innovation and resilience in the face of disruption (2, 14). Despite extensive research on strategic planning and technology integration, there remains a need for comprehensive models that capture the dynamic interplay between teachers' strategic thinking processes and the structural, psychological, and contextual conditions of online education (11, 19).

Therefore, the present study aims to design and validate a strategic thinking model for primary school teachers in online education, providing a theoretical and practical framework for enhancing instructional quality and aligning teaching practices with the demands of 21st-century learning environments.

Methods and Materials

In this study, the strategy employed was qualitative grounded theory. This method is a systematic effort to derive "theory" from "data." The grounded theory approach uses coding as a fundamental method of specification; in this way, a theory is developed from multiple data sources within the research and evolves from indicators into theory.

The process of theory emergence is carried out through open, axial, and selective coding. The process of concept saturation ensures the validity and reliability of the study. Qualitative studies offer criteria such as credibility, dependability, transferability, and confirmability to ensure their trustworthiness, which are supported through various strategies such as audit trails and concurrent review during the coding stage. Grounded theory is a research method developed by two American sociologists, Barney Glaser and Anselm Strauss.

In the present study, the systematic approach was used. This approach employs a systematic set of procedures inductively to develop theory about a phenomenon. Grounded theory is considered one of the research strategies through which theorizing is based on the main concepts derived from the existing data in the field. This type of theorizing is based on the metaphor of collage and is similar to the Garbage Can Model of decision-making, in which a new, innovative, and appealing composition is created from the random convergence of elements, guided by the theorist's creativity. In other words, the grounded theorist navigates through a field of diverse and scattered data and, with their ingenuity, combines them to achieve a new theory. Therefore, creativity is one of the key elements of grounded theory. The procedures of this method compel the researcher to break preconceptions and create new order from old elements.

In grounded theory research, the resulting theory is a process theory. Although grounded theorists may investigate a single concept (e.g., leadership skills), they often examine a process because understanding the social world requires acknowledging that people interact with one another.

The statistical population consisted of academic experts and specialists in educational technology management and curriculum studies, who were selected through theoretical sampling. In this study, interviews were conducted with 16 experts. Data saturation was observed from the fourteenth interview onward, but to ensure saturation, interviews continued until the sixteenth participant. Data collection began in Winter 2022 and continued until June 2023. The interviews were semi-structured,

with questions about the levels and components of the conceptual model. All interviews were recorded, and after each interview, the collected data were analyzed to build the model.

Findings and Results

In the first phase, the characteristics of the interviewees were described and presented as shown in the tables below.

Table 1. Description of Research and Executive Background

Number of Interviewees	Research and Executive Experience		5–10 years	11–15 years	More than 16 years	
16	Frequency		2	5	9	
	Percentage		30%	30%	20%	
Number of Interviewees	Education	Field of Activity	Doctoral Student	PhD	Academic	Executive
16	Frequency	2	14	10	6	
	Percentage	10%	90%	60%	40%	

Table 2. Excerpts from Selected Interviews

No.	Statements
1	Teachers' concerns in online education relate to the quality of learning. In teachers' insight, how students' knowledge adapts to the electronic environment and their ability to plan instruction in primary education can be crucial.
6	The existence of an information platform in structured planning can create conditions for change and innovation in online learning behavior.
8	Strengthening commitment in teaching and learning, both in face-to-face and online settings, and paying attention to the social status of teachers in the online education environment can foster innovative behavior in their students and, most importantly, acceptance of this change.
13	Through continuous learning of educational technology, teachers can achieve skill-based self-efficacy in online education.
17	According to Islamic narrations and traditions, human beings must always remember death and the afterlife.
32	The prerequisite of monotheistic governance is adherence to trust and justice in public property.
35	Future-oriented thinking in education creates a development-oriented environment that connects societal needs to the educational environment through the simplest strategies.
42	A strategic outlook in online education is among the necessities that should be considered a strong educational support in educational organizations.
45	Strategic thinking in education for the future society of primary schools must devote all efforts and energy to technologizing education.
51	One of the characteristics of online education is effort and perseverance in distance learning. This is among the core features of strategic thinking in online education.
56	Acquiring professional skills in e-learning can be a turning point in accepting non-face-to-face education.
61	The ability to conduct online education in primary schools to be useful and provide services for the organization will foster positive energy in the world of technology.
64	Order, adherence to regulations, and organizational adaptability can help teachers behaviorally cope with change.
65	One of the most vital pillars of sound and effective management of educational institutions is the existence of a complete and precise system of supervision and strategy in education.
69	Teachers must carry out tasks based on the standards of online education of which they are aware.
79	Teachers' acceptance of technology and systems in online education plays an important role in ensuring the health of teaching and learning.
80	The perception of a shared vision in knowledge sharing is among the outcomes of educational change, especially in online education. Paying attention to structured planning and educational discipline in online education, along with continuous follow-up, can contribute to the growth of online education during this dangerous period of disease and the spread of COVID-19.
81	Creative behavior emerges from sincerely fostering hope for the future, positive thinking among managers, and transferring positive energy to teachers.
82	Technology-based educational capability affects the quality of teaching and learning among students and teachers in online education.
84	If teachers' intellectual capital is directed toward increasing their digital literacy, desirable online education can be expected.
86	Behavior combining traditional and modern technology-based methods can play a role in managing the quality of online education.
90	Online education will be effective in learning when the perception of a change-oriented learning culture is reinforced through attention to effective and efficient communication.

In above table, the open coding of the interviews after editing is presented. These codes are adapted from the interview texts and, in some cases, quoted verbatim. A total of 94 open codes were extracted from the analysis of 16 interviews. Due to the large volume of data, axial coding—the second stage of data analysis in grounded theory—was conducted. The purpose of this

stage is to establish relationships between the categories generated during the open coding stage. This is carried out based on the paradigm model and helps the theorist facilitate the process of theory development (Danaeefard et al., 2004).

While open coding breaks down data into various categories, axial coding links the categories to one another according to their characteristics and dimensions. In other words, this stage of coding focuses more on the convergence and complementarity of the codes.

At this stage, considering (1) the type of questions the interviewer asks the interviewee (questions centered on causal conditions, the core category and its dimensions, contextual conditions, structures and strategies, and consequences) and (2) the researcher's analysis and coding of the responses, the identified concepts and categories are distinguished and presented in the following tables: (a) Causal Conditions.

Table 3. Axial Coding of Causal Conditions

Category	Concepts	Statements	Indicators
Individual dimension in strategic thinking	Creating online commitment	Transparency in accountability	A3, F2, E22
		Individual empowerment	G4, E16
		Technological trust-building	F1
		Effective teaching	H15
	Strategic control and supervision	Technological self-awareness	D2, J4, H16, C17, L11
		Technological self-control	F32, F25, K16
		Educational discipline in the online domain	B20, F14
	Online education interaction	Technological communication skills	P7
		Respect for suggestions and criticisms	D1
		Flexibility	A5, D3
		Resilience management	F28, F26
Social dimension	Communications	Social prestige	E31
		Recognition of social networks	D6, B12
		Participatory capability	F4, G5
	Shared vision	Strengthening team spirit in online education	E32, E29
		Systemic outlook	B5, B7, A8
		Social adaptability in the crisis of face-to-face education	A1, F10, H2
Technical dimension	Technology adoption	Perceived usefulness of online education	E7, B28
		Opportunity creation in online education	F8
		Technical readiness of schools for online education	G3
Organizational dimension	Supportive policies	Moral support from educational managers	A4
		Reward and promotion mechanisms	D15
		Strengthening the e-learning system	A33, A11

Table 4. Axial Coding of Strategies

Category	Concepts	Statements	Indicator Codes
Online education roadmap	Program orientation	Dynamic planning	C11
		Achieving cognitive-domain objectives	A30, B21, C19, P4
Individual		Analytical and evaluative capability in online education	C27
		Aligning teaching and learning	D8
		Self-efficacy	D22, B22
Technology		Recognition of social networks	B12
		Opportunity recognition to enhance capability in online education	A26, D7

Table 5. Axial Coding of Contextual Conditions

Category	Concept	Statements	Indicator Codes
Structural context in online education	Educational	Opportunity recognition in online education	A16

	Transparency in acquiring technology-driven professional skills	G16
Resources	Recognition of resources and equipment	F6, G5
	Technical adaptability of schools and online education	F7, G24, G6
	Capability in planning online education	J7
	Recognition of professional rules in online education	G9, L21
Individual–psychological	Interest in online education	A31
	Recognition of technology in the domain of online education	D20
	Perception of a communication culture with students	G7, F8
	Recognition of online education and social networks	D11
	Analytical intelligence for academic progress in online education	F9
	Having innovative behavior in online education	B26
	Stable job security	F10, G8
Behavioral	Order and program orientation	F11
	Honesty and clarity in behavior	A22, G12
	Professional ethics in online education	F14
	Perception of a self-control culture	J6, H27
	Innovative thinking in online education	F26

Table 6. Axial Coding of Intervening Conditions

Category	Concepts	Statements	Indicator Codes
Individual–professional	Technical	Instability in educational programs	A18
		Neglect of time management in online education	A32
		Non-acceptance of technology	A33
		Lack of continuous effort	D35
		Educational and research resources and references	N10
Organizational	Managerial	Disregard for teamwork and participation	A35, P20, B27, L20, L9
		Disregard for criticisms and suggestions in the domain of online education	E29, C27, N9
Organizational		Disregard for a fair reward and promotion mechanism	E28, P11, P19, D28, E30
		Incompatibility between face-to-face and distance education	D27
		Lack of socialization of online education	L16

Table 7. Axial Coding of Consequences

Category	Concepts	Statements	Indicator Codes
Scientific–technical	Cognitive	Timely thinking in decision-making	L18
		Strengthening self-efficacy	H18
		Training specialists in online education	J33
		Strengthening professional self-monitoring in online education	F32, M20
		Strengthening job discipline	N23
		Increased capability in the domain of online education	J22
Applied	Operational	Program orientation	A6, J10, H34, H13
		Strengthening technical knowledge in online education	E3, P3
		Job acceptability	E8
		Responsibility-centered accountability	B29, B29
		Strengthening innovative thinking	N16
		Use of technology in the domain of online education	C2
		Full recognition of the online education ecosystem	N2
		Operationalizing knowledge in online education	N20

Through axial coding, the categories extracted from open coding were organized into six groups: the core category, causal conditions, intervening conditions, contextual conditions, strategies (actions or reactions), and consequences. Among the categories extracted in the present study, teachers' insight in the domain of online education was considered the core category and placed at the center of the model. The reason for selecting this as the core category is that its traces can be clearly observed

in most of the data. In other words, most respondents indicated that teachers' insight in the domain of online education requires specific and distinct mechanisms, and it cannot be successfully enhanced through current methods and procedures. Therefore, this category can be placed at the center, with other categories linked to it. The chosen label for the core category is both abstract and comprehensive.

Discussion and Conclusion

The findings of this study led to the development of a grounded model explaining how primary school teachers develop and apply strategic thinking in the context of online education. This model identifies teachers' insight in online education as the core category influenced by four major sets of conditions—causal, contextual, and intervening—and shaped through strategic actions that ultimately produce scientific-technical and applied consequences. The emergence of this model highlights the centrality of teachers' cognitive, behavioral, and organizational capacities in navigating the complex landscape of digital instruction.

One of the central findings is that strategic thinking at the individual level—including commitment-building, self-awareness, and technological self-control—forms the foundational driver of teachers' insight in online education. This is consistent with research emphasizing that strategic thinking enables individuals to integrate foresight, conceptualization, and decision-making skills to address long-term goals under uncertainty (2, 14). Teachers who demonstrate stronger strategic thinking are more likely to design adaptable instructional plans, anticipate potential disruptions, and align their teaching practices with overarching educational objectives. These results echo evidence that strategic thinking enhances teachers' sense of agency and responsibility, improving both instructional quality and organizational performance (3, 15).

The model also revealed that social and organizational dimensions of strategic thinking play a vital role in strengthening teachers' engagement with online education. This aligns with studies showing that teachers' ability to participate in collaborative networks and perceive organizational support fosters resilience and innovation in digital environments (1, 21). When teachers operate in settings that support teamwork, open communication, and knowledge sharing, they become more inclined to experiment with new digital pedagogies, which in turn reinforces their strategic perspective. This resonates with findings that participatory school cultures can stimulate creative problem-solving and professional commitment, particularly when shifting from traditional classrooms to online settings (5, 10).

Furthermore, technological readiness and acceptance emerged as a significant causal and contextual factor in the model. Teachers' strategic engagement was shown to be contingent upon their perceived technological self-efficacy, their access to digital resources, and their ability to plan and adapt curricula for online settings. This is consistent with research indicating that teachers' attitudes toward technology adoption are shaped by their prior experience, digital literacy, and the perceived usefulness of online tools (19, 20). Teachers with high levels of self-esteem and critical thinking are less likely to experience anxiety and more likely to embrace innovative technologies in their classrooms. Similarly, evidence shows that clear structures, training support, and digital infrastructure significantly enhance teachers' motivation to implement online instructional practices (7, 22).

The model also shows that intervening conditions such as managerial neglect, lack of teamwork, and limited institutional support can hinder the development of strategic thinking among teachers. This finding echoes prior studies highlighting how unsupportive organizational contexts, inadequate reward systems, and unclear promotion mechanisms weaken teachers' motivation to engage strategically (5, 16). When educational systems fail to provide clear career pathways or collaborative structures, teachers often respond with resistance or superficial compliance rather than deep engagement. This supports the

notion that institutional culture is a mediating variable between teachers' strategic orientation and their actual classroom behaviors (1, 15).

Interestingly, the results revealed that teachers' strategic thinking manifests through specific strategies, notably program-oriented planning, aligning teaching and learning, fostering analytical evaluation skills, and building self-efficacy in online environments. These strategies directly contribute to achieving cognitive domain objectives, suggesting that teachers consciously design instruction to promote higher-order thinking skills among students. This aligns with research emphasizing that metacognitive and critical thinking skills are critical enablers of effective online teaching (8, 9). Moreover, the adoption of structured planning and reflective practices mirrors previous findings showing that scenario planning techniques can enhance educators' adaptive thinking and help them anticipate future challenges (17).

The findings also highlighted how teachers' behavioral dispositions—such as honesty, discipline, innovation, and self-control—function as contextual enablers of strategic thinking. Teachers who maintained professional ethics, order, and openness to change were better able to translate strategic plans into practice. This is in line with studies demonstrating that professional responsibility and moral commitment are essential for sustaining pedagogical innovation (10, 11). It also supports the idea that strategic thinking is not merely a cognitive ability but also a behavioral and cultural orientation that shapes how teachers interpret challenges and enact solutions (12, 13).

In addition, the results indicate that teachers' insight in online education produces both scientific-technical and applied outcomes, including improved self-efficacy, enhanced decision-making, stronger discipline, and increased professional acceptance. These consequences confirm that strategic thinking directly contributes to teachers' career development and instructional effectiveness. Prior studies similarly report that strategic competencies improve teachers' productivity and innovation by enabling them to align organizational goals with classroom practices (3, 14). The development of such competencies also helps teachers operationalize abstract knowledge into concrete practices that can be continuously improved and scaled (24, 25).

Furthermore, the findings suggest that student-centered pedagogies—such as game-based learning and active participation—are more likely to be implemented by teachers who possess strategic thinking skills, as they can link these approaches to long-term educational goals and organizational priorities. This aligns with evidence that teachers' predisposition to use game-based pedagogy depends on their ability to evaluate risks, allocate resources, and anticipate outcomes (21, 23). Strategic thinkers are more inclined to view these innovative methods not as isolated activities but as elements of a coherent instructional vision.

Finally, the results revealed that strategic thinking supports teachers' resilience during periods of disruption, such as the COVID-19 pandemic, by enabling them to design flexible instructional pathways, maintain student engagement, and sustain their professional identity despite uncertainty. This aligns with studies showing that strategic foresight and scenario thinking help teachers and organizations cope with crisis conditions (4, 5). Teachers with strategic mindsets were more likely to adapt their roles and preserve instructional continuity, highlighting the protective role of strategic thinking in volatile educational contexts.

Despite the valuable insights gained from this study, several limitations should be acknowledged. First, the sample consisted of a relatively small group of expert teachers and educational specialists, which limits the generalizability of the findings to broader populations of primary school teachers. While theoretical saturation was achieved, the inclusion of more diverse participants across regions and school types could have yielded additional perspectives. Second, the data relied on self-reported interviews, which may be influenced by participants' social desirability bias or retrospective reconstruction of their experiences. Observational or longitudinal data could have provided a more objective and dynamic understanding of teachers' strategic

thinking processes. Third, the study was conducted within a specific cultural and educational context, and the transferability of the findings to other cultural settings or educational systems may be constrained by contextual differences.

Future studies could build upon this model by employing mixed-method or longitudinal designs to trace how teachers' strategic thinking evolves over time and influences student outcomes. Incorporating quantitative measures of strategic thinking, self-efficacy, and digital literacy could provide more robust evidence of the relationships proposed in this model. Future research might also explore the role of organizational policies, leadership styles, and school culture in fostering or hindering strategic thinking among teachers, providing a multi-level analysis that links individual cognition to institutional structures. Moreover, comparative studies across different educational systems or cultural contexts could identify universal versus context-specific elements of the model, contributing to its broader applicability.

Educational policymakers and school administrators should consider embedding strategic thinking development into teacher training and professional development programs, especially those focused on online education. This can be achieved by offering workshops on scenario planning, foresight analysis, and reflective decision-making. Schools should also cultivate organizational cultures that encourage collaboration, risk-taking, and innovation, allowing teachers to apply strategic thinking without fear of failure. Furthermore, providing access to digital infrastructure, mentoring systems, and supportive leadership will enhance teachers' readiness to adopt new technologies and sustain innovative pedagogies. By institutionalizing strategic thinking as a professional competency, education systems can better equip teachers to navigate the complexities of online teaching and prepare students for the demands of 21st-century learning.

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Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

All ethical principles were adhered in conducting and writing this article.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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