

From Innovation to Implementation: The Dynamics of Policy Diffusion in Indonesian Education Reform

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ABSTRACT

Objective: This study proposes a set of guidelines for the formulation of public policy directed at the development of educational innovation in Indonesia, drawing on an exploration of relevant literature to identify the critical dimensions of innovation development within the Indonesian context. **Method:** The literature reviewed was selected on the basis of source credibility, timeliness, and relevance. **Results:** The first part of the study addresses three interrelated problems, namely the widening gap between society and education, the factors that facilitate or impede educational innovation in Indonesia, and the trends that currently characterize educational innovation in the country. By employing Diffusion of Innovation Theory (DIT) to identify its constituent elements, namely innovation, social system, time, and communication channels, the second part of the study proposes a framework of guidelines for public policy formulation. This framework comprises five components: building consensus, adopting a systemic and contextual vision, valuing educators, working within learning communities, and leveraging information and communication technology. **Novelty:** These guidelines are intended to serve three purposes: first, to formulate policies capable of guiding and sustaining change within the education sector, particularly in Indonesia; second, to enable more systematic, efficient, and scientifically grounded planning, development, and evaluation of innovation; and third, to contribute to the cultivation of a culture of educational innovation in Indonesia.

INTRODUCTION

In theoretical terms, society and education are expected to sustain a convergent relationship, in which shifts occurring within the social order are subsequently mirrored in the domain of education [1]. In the Indonesian context, this relationship functioned with relative stability during the early twentieth century, when the Dutch colonial administration began establishing schools and formal educational institutions on the archipelago [2]. Throughout that period, the interaction between society and education remained largely consolidated, subject only to gradual and incremental change. The present era, by contrast, is marked by rapid transformation driven primarily by scientific-technological and socio-cultural forces, themselves consequences of globalization and the massive, strategic circulation of information and knowledge. The character of twenty-first-century Indonesian society demands a form of education capable of responding to these forces, a demand that has yet to be fully consolidated despite efforts undertaken by various organizations and government bodies across the country's regions. In this regard, UNESCO [3] has underscored the urgency of adapting the educational sector to the transformations society is undergoing in knowledge, technology, information, emerging languages, communication, and research, a process that has positioned innovation as a central feature of the new social landscape. Innovation consequently became a primary

concern of education during the latter half of the twentieth century, gradually displacing the prominence once held by the worlds of administration and business. Modernizing schools is therefore regarded as indispensable to achieving broader societal modernization, which in turn requires adaptation to a changing era [4]. Challenges of this magnitude confront governments, institutional leaders, planners, and professionals across relevant sectors, compelling them to seek alternative solutions capable of progressively narrowing the gap between societal demand, existing educational quality, and educational relevance.

The gap between education and society cannot, however, be resolved through conventional solutions premised on partial reform of the education system's structure. What is instead required is a strategy capable of narrowing this gap in order to achieve a more substantial equilibrium between contemporary societal demands and the quality, relevance, and equity of the education on offer. That strategy is innovation, understood as a force that must be directed toward structural change within the traditional education system [5]. Formulating public policy that establishes the appropriate conditions for such innovation to succeed, and that thereby contributes to improved educational services, becomes an essential undertaking. Accordingly, this study is directed toward proposing a set of guidelines for the formulation of public policy aimed at the development of macro-level educational innovation in Indonesia.

The concept of innovation has been examined and applied extensively across a wide range of contexts, and over time it has increasingly permeated the discourse of productive organizations. Gros and Lara [6] define innovation as the process of generating new knowledge, products, and processes, a process regarded as integral to organizational performance given its status as a critical value for twenty-first-century society. Damayanthi and Rahmawati [7], however, argue that innovation is not confined to the improvement of products and processes but extends to the modification of more substantive dimensions, namely beliefs, habits, values, attitudes, and traditions shared among groups within an organization, elements that together constitute what is commonly termed organizational culture [8]. Damayanthi and Rahmawati [7] further contend that innovation is ultimately oriented toward transforming the mental models of society, understood as the unconscious cognitive structures through which individuals interpret the world, act within it, and experience it. Such models may take the form of generalizations, deeply held assumptions, theories, images, or paradigms. This foundational understanding of innovation invites deeper reflection on how the term is applied across various domains, education included, and leads to a fundamental question: what, in essence, constitutes educational innovation?

To address this question, the present study draws on three definitions representing distinct approaches to the concept. First, UNESCO, as cited in Fuad et al. [9], conceives of educational innovation as a deliberate and planned act of problem-solving aimed at achieving a higher quality of student learning that transcends traditional paradigms, moving beyond mere academic knowledge and shifting away from passive student learning toward a conception in which learning is understood as interaction and co-

construction. Second, Gros and Lara [6] define innovation as the process of generating new knowledge, products, and processes, positioning it as an essential feature of organizational work given its significance for twenty-first-century society. Third, Carbonell [10] conceives of educational innovation as a more or less systematic set of ideas, processes, and strategies through which an individual, or a particular party, attempts to introduce, provoke, and drive change in existing educational practice. Drawing on these definitions collectively, four central ideas concerning the concept of educational innovation can be identified: first, no consensus exists among scholars as to precisely what educational innovation entails; second, educational innovation, as a planned and deliberate process of change, transforms educational reality in ways that must remain adaptive and aligned with the needs of both the educational context and the broader society; third, innovation constitutes a process of generating new knowledge, products, and processes; and fourth, the ultimate purpose of educational innovation is to improve the quality of learning and to advance equitable education.

From a theoretical standpoint, this study understands educational innovation as a complex process aimed at transforming the various factors that intervene in learning, including curricular conception, structure, and content; teachers' traditional pedagogical practices; students' responsibility for their own learning; the quality and relevance of educational resources; evaluation techniques; and school management. It is important to note that these elements do not constitute a mere aggregation of factors acting individually or independently, nor does improvement in a single aspect suffice; rather, what is required is a joint, interactive, and complementary action among these factors directed toward achieving education that is of high quality, relevant, and equitable. This points toward a form of disruptive innovation intended to generate impact across the entirety of the macro-educational context, a type of innovation that enables a drastic and linear evolution in the methods, techniques, and processes of teaching and learning. Disruptive innovation, in other words, permanently alters the manner in which the parties involved in a given context, together with its media and environment, relate to one another as a whole.

This study is framed within Everett Rogers's Diffusion of Innovation Theory (DIT), one of the most widely disseminated and adopted models for examining the adoption of innovation across diverse fields, including political science, health, education, information science, library science, and numerous other disciplines. According to Rogers and Scott, the research paradigm concerning the diffusion of innovation traces its roots to studies conducted during the 1940s within the field of rural sociology [11]. It is generally accepted that research on the diffusion of innovation model began, both conceptually and methodologically, in 1943 with the study conducted by Bryce Ryan and Neal Gross on the diffusion of hybrid seed corn among farmers in Iowa [12]. Although the Ryan and Gross study proved successful, it was not until the 1960s that research on the diffusion of innovation began to be developed and applied within other fields of knowledge, such as public health, education, communication, marketing, geography, sociology, and economics. Minishi-Majanja and Kiplang'at [11] further note

that DIT began to be used more broadly to examine the diffusion of innovation across highly diverse fields precisely from the 1960s onward. Nevertheless, the work conducted by Everett Rogers is generally regarded as the most comprehensive synthesis of the aspects associated with the diffusion of innovation [13]. Surry and Ely [13] further note that the theory and concepts advanced by Rogers can be applied across nearly every field of scientific inquiry. More recently, other disciplines have begun applying DIT within the context of information and communication technology and library science [14], as well as educational technology [15], all of which are closely intertwined with the technological advances of recent decades that have contributed to the disruption of conventional forms of instruction.

Rogers [16], in the opening chapter of his work *Diffusion of Innovations*, defines diffusion as the process through which an innovation is communicated through particular channels over time among members of a social system. He further connects the concept of diffusion with that of communication, integrating the two within a coherent process framework. According to DIT, four key elements structure the process by which new information, ideas, practices, or objects diffuse: innovation, communication channels, time, and social system.

The first key element is innovation itself, referring to any idea, practice, or object perceived as new by an individual or by the adopting unit [16]. Based on Rogers's formulation, five attributes fundamentally shape the innovation-decision process under DIT. The first is relative advantage, referring to the extent to which an innovation is perceived by prospective adopters as superior to what it supersedes. The second is compatibility, referring to the degree to which an innovation is consistent with the values, past experiences, and needs of prospective adopters. The third is complexity, referring to the extent to which an innovation is perceived as difficult to understand or use. The fourth is trialability, referring to the extent to which an innovation may be experimented with on a limited basis prior to full adoption. The fifth is observability, referring to the degree to which the results of adopting an innovation are visible to others. Jeyaraj and Sabherwal [17], for their part, identify additional attributes shaping the innovation-decision process, namely usefulness, ease of use, complexity, and quality, while Dearing, as cited in Dearing [18], places greater emphasis on the uncertainty and risk that may accompany the process of adapting to an innovation.

The second element of the diffusion process is the communication channel, through which information concerning an innovation flows and spreads. Rogers [16] describes communication channels as the means by which information travels from one individual to another, while Margaix-Fontestad [19] similarly characterizes them as the means through which a message reaches an individual, encompassing both mass media and interpersonal channels. The third element is time, regarded as one of the fundamental dimensions of the diffusion process [16]. Under DIT, the temporal dimension is distributed across three axes. The first axis concerns the innovation-decision process, in which the decision to adopt an innovation is planned and initiated. The second axis, termed innovativeness, refers to the relative degree of earliness with which an

individual adopts a new idea, object, or practice compared with other members of the same social system. The third axis concerns the rate of adoption. The temporal variable allows adopters of an innovation to be classified according to their degree of relative earliness in adoption, with each resulting category exhibiting distinct characteristics shaped by differing frequencies of adoption over a given period following the innovation's introduction [20]. Rogers [16] classifies adopters of an innovation into five categories: innovators, early adopters, early majority, late majority, and laggards.

The final element of Rogers's DIT model is the social system, which Rogers [16] conceives of as a set of interrelated units bound together in pursuit of a shared goal through joint problem-solving. According to Rogers [16], opinion leaders and change agents can be identified among the members of a social system. Margaix-Fontestad [19] refers to the former as mediators of the diffusion process, while change agents are understood as individuals who seek to influence prospective adopters, a role that carries considerable responsibility [21].

RESEARCH METHOD

As indicated above, this study is directed toward proposing a set of guidelines for the formulation of public policy aimed at the development of educational innovation in Indonesia, based on an exploration of relevant literature undertaken to identify the critical dimensions of innovation development within the Indonesian context. The study adopts an exploratory design with a qualitative approach, grounded in a post-positivist paradigm that emphasizes not only objectivity and scientific method but also the subjectivity, assumptions, and reflective judgment of the researcher. Data were collected through documentation drawn from a range of literature, with articles selected through purposive sampling according to the following criteria: (a) the source addresses educational innovation in Indonesia, whether in terms of its historical development and processes, the policies that have been implemented, or the various factors that influence it; (b) the source is written in either Indonesian or English; and (c) the source takes the form of a credible journal article, scholarly book, or other reputable publication. Further detail concerning the data on educational innovation in Indonesia is presented in Table 1. Using Diffusion of Innovation Theory (DIT), the data were then analyzed to elucidate the relative advantage, compatibility, complexity, trialability, and observability associated with the adoption of the proposed educational innovation policy framework.

Table 1. Description of Data on Educational Innovation in Indonesia.

No.	Aspect	Data Code	Data Code Description
1	Historical development of educational innovation in Indonesia	DT/JN/ZHR&DNV&ZND/2023	Textual data, national journal article: Zamhari, Dwi Noviani, and Zainuddin, "Perkembangan Pendidikan di Indonesia" [1]
		DT/JN/BAH&SMR&AAV/2024	Textual data, national journal article: Bakharudin All Habsy, Stevi Marcelina Rahmadya, and Aurelyn Ayu Vara

No.	Aspect	Data Code	Data Code Description
2	Guidelines for public policy formulation in the process of adopting educational innovation in Indonesia	DT/JN/HAD&BHA&ANR/2024	Azzahra , “Inovasi Pendidikan di Indonesia” [5] Textual data, national journal article: Humaira Dzakiyya Azizah, Bihar Hadil Alam, and Andia Nursyaban, “Sejarah Pendidikan di Indonesia dari Masa Prasejarah Hingga Awal Kemerdekaan” [2]
		DT/JN/IFR&RYL&SHD&RSD/2023	Textual data, national journal article: Ilham Farid, Reka Yulianti, Soleh Hidayat, and Ratna Sari Dewi, “Perkembangan Pendidikan di Indonesia dari Masa ke Masa” [22]
		DT/BK/BAW&TAP&AFB/2023	Textual data, scholarly book: Bayu Ananto Wibowo, Taufik Agung Pranowo, and Arip Febrianto , “Sejarah Pendidikan” [23]
		DT/JN/BHD&TAL&KRM&MAS/2023	Textual data, national journal article: Bagus Hidayatullah, Tri Alawiyah, Karoma, and Mardiah Astuti (2023), “Studi Literatur: Karakteristik dan Strategi Inovasi Pendidikan” [24]
		DT/BK/RAN&AMR/2017	Textual data, scholarly book: Rusydi Ananda and Amiruddin (2017), “Inovasi Pendidikan: Melejitkan Potensi Teknologi dan Inovasi Pendidikan” [25]
		DT/JN/MSW/2019	Textual data, national journal article: Meidawati Suswandari (2019), “Cooperative Learning: Strategi Pengembangan Inovasi Pendidikan di Indonesia” [26]
		DT/JN/AZK/2010	Textual data, national journal article: Amrazi Zakso (2010), “Inovasi Pendidikan di Indonesia Antara Harapan dan Kenyataan” [27]
		DT/JN/TKD&RAW/2017	Textual data, national journal article: Titi Kadi and Robiatul Awwaliyah (2017), “Inovasi Pendidikan: Upaya Penyelesaian Problematika Pendidikan di Indonesia” [28]
		DT/JN/BAH&SMR&AAV/2024	Textual data, national journal article: Bakharudin All Habsy, Stevi Marcelina Rahmadya, and Aurelyn Ayu Vara

No.	Aspect	Data Code	Data Code Description
3	Factors supporting or inhibiting educational innovation in Indonesia	DTA/JN/DWA&UBW&HAR&SST/2022	Azzahra (2024), "Inovasi Pendidikan di Indonesia" [5] Textual data, national journal article: Dewi Ambarwati, Udik Budi Wibowo, Hana Arsyiadanti, and Sri Susanti (2022), "Studi Literatur: Peran Inovasi Pendidikan pada Pembelajaran Berbasis Teknologi Digital" [29]
		DT/JN/TKD&RAW/2017	Textual data, national journal article: Titi Kadi and Robiatul Awwaliyah (2017), "Inovasi Pendidikan: Upaya Penyelesaian Problematika Pendidikan di Indonesia" [28]
		DT/JN/LAM&DRS/2022	Textual data, national journal article: Lisna Amelia and Deti Rostika (2022), "Problematika Inovasi Pendidikan Indonesia" [30]
		DT/JN/AZK/2010	Textual data, national journal article: Amrazi Zakso (2010), "Inovasi Pendidikan di Indonesia Antara Harapan dan Kenyataan" [27]
		DT/BK/LTS/2012	Textual data, scholarly book: L. Tjipto Subadi (2012), "Inovasi Pendidikan" [31]

RESULTS AND DISCUSSION

The Historical Development of Educational Innovation in Indonesia

This section analyzes the principal milestones of educational innovation in Indonesia. The relevant literature indicates that the history of this process began in the early 1900s, when the Dutch colonial administration began occupying Indonesia and establishing schools intended for the population of the Dutch East Indies. During this period, education emerged as part of the Ethical Policy (Politik Etis) pursued by the Dutch government, although formal education at the time was stratified according to social class, caste, and lineage. The education system of this era was therefore markedly discriminatory, with formal schooling accessible almost exclusively to the children of indigenous officials and nobility. Instruction was oriented primarily toward the Dutch language and administrative skills that served colonial interests, and was organized into several tiers: the Europeesche Lagere School, a primary school for Europeans; the Hollandsch Inlandsche School (HIS), a primary school for indigenous pupils; the Meer Uitgebreid Lager Onderwijs (MULO), equivalent to junior secondary education; and the Algemeene Middelbare School (AMS), equivalent to senior secondary education. This innovation was associated with an externally directed program of educational reform, understood by the colonial government as a planned and systematic process of change.

Innovation imposed from outside in this manner failed to produce the anticipated impact in transforming school culture.

Over time, however, the education system, previously constrained by colonial regulation, began to develop with greater independence from Dutch control. From the 1930s onward, formal education began reaching nearly all segments of Indonesian society, though this development proved short-lived, as the system was subsequently reshaped by the Japanese occupation (1942–1945). A fundamental change during this period was the shift in the official language of instruction from Dutch to Indonesian. The class-based stratification that had characterized the Dutch colonial system was likewise abolished, resulting in a more integrated education system. A further change concerned the structure of schooling itself, which under the Japanese occupation consisted of six years of primary education (*kokumin gakko*) followed by three years of junior secondary and three years of senior secondary education. Although several of these changes were initially regarded as positive, scholars generally consider education under Japanese occupation to have deteriorated relative to the colonial period; the number of primary schools, which had reached 17,848 in 1940/1941, declined to 15,069 as a consequence of the occupation.

Following Indonesia's independence in 1945, the government began efforts to construct a more inclusive and democratic education system. After an initial period of curriculum formulation between 1947 and 1949, Law No. 4 of 1950 concerning the National Education System was enacted, establishing foundational principles that emphasized educational equity, quality improvement, and the goal of advancing the nation's intellectual life. Primary education was prioritized during this period, with an explicit commitment to eliminating illiteracy across the country. Notwithstanding this progress, considerable challenges persisted, including limited infrastructure and a shortage of qualified teaching staff. Educational innovation during this era was largely teacher-led, and while notable developments occurred within formal, non-formal, and community-based educational experience, much of this experience remained shaped by divergent pedagogical currents that were critical of academic practices failing to foster critical thinking, autonomy, or the tools required to transform lived reality.

During the New Order era (1966–1998), the government promoted a nine-year compulsory basic education program and introduced a more structured system of secondary and tertiary education. Education during this period was highly centralized, with policy strongly oriented toward the formation of national character and economic development through education. Although access to and the quality of education improved, policy during this era tended toward centralism and did not consistently accommodate Indonesia's regional and cultural diversity; several policies also reflected the imposition of particular values in support of the prevailing state ideology, including Pancasila and Indonesian nationalism. Following the Reform era (*Reformasi*) of 1998, Indonesia entered a period of democratization that likewise reshaped its education system. Education became more open during this period, affording greater opportunity for diverse segments of society to participate in educational decision-making. In 2003, the

government enacted Law No. 20 of 2003 concerning the National Education System, which affirmed that education must be grounded in human rights, must provide equal opportunity for all, and must foreground character and cultural diversity. The curriculum was likewise revised, with greater emphasis placed on critical and creative learning. Innovation during this era centered on the global transformation of the education system with the aim of improving educational equity, quality, effectiveness, and efficiency, and was closely associated with models of decentralization and school-based autonomy.

From 2010 onward, innovation efforts shifted toward preparing individuals for change itself, premised on the recognition that the education system cannot simply wait for structural change to occur, given its inherently non-linear, fragmented, and often incoherent character, features that likewise pervade an increasingly complex society. Individuals within this period were consequently expected to cultivate the capacity for continuous learning without allowing ongoing change to become destabilizing, while also working to establish coherent patterns both individually and collectively. Since 2015, innovation has been grounded more explicitly in processes of learning, reflecting its association with transformative action in the world; innovation in this sense carries a profound sense of change precisely because its characteristic outcomes do not arise spontaneously but must instead be deliberately organized and planned so that innovative learning spaces can generate impact across multiple domains of society. Correspondingly, twenty-first-century innovation has become closely associated with the integration of new information and communication technology (ICT) into education, an integration that has grown increasingly urgent amid the challenges posed by globalization, the information economy, and an increasingly interconnected world. Technology-based and digitally mediated education gained particular importance following the COVID-19 pandemic, which compelled schools to shift toward online learning. Nevertheless, disparities in educational quality between urban and rural areas, together with unequal access to technology, remain pressing issues. The government and various stakeholders continue to work toward improving educational quality through enhanced teacher competence, curriculum development responsive to contemporary needs, and the pursuit of a more equitable and just education system.

The following section summarizes current trends in educational innovation in Indonesia. First, instructional models in Indonesia have increasingly adopted a comprehensive set of pedagogical tools grounded in UNESCO's four pillars of education, namely learning to know, learning to do, learning to be, and learning to live together, a framework that has been accompanied by the growing use of textbooks, dedicated educational portals, management systems, forums, and Web 2.0 platforms intended for teachers, parents, and students. Second, short instructional or educational videos have been widely adopted by educational institutions as free virtual course material catering to students with diverse educational needs, with their use progressively spreading internationally and being applied across self-directed courses, blended classrooms, and as supplementary support for face-to-face instruction. Third, open-access educational

content portals have diversified the range of available educational material, offering teachers and students expanded learning options beyond the classroom and thereby enabling more varied instructional planning. Fourth, drawing on technological and internet-based resources, a growing number of schools have organized themselves into networks and now participate through various digital platforms; technology and the internet are increasingly used to facilitate interaction between teachers and students, with platforms such as Google Classroom, Moodle, and Edmodo offering accessible interfaces through which teachers can extend classroom discussion, share new material, introduce discussion topics, or coordinate group assignments. Fifth, the renewal of science instruction represents a new approach to teaching science grounded in the use of video games and other resources, exemplified by initiatives such as the GEMBIRA application, developed for the Perception and Rhythm Communication Development Program (Pengembangan Komunikasi Persepsi Bunyi dan Irama, PKPBI) for deaf students. Sixth, there is a growing trend toward self-directed and personalized computer-based learning, extending beyond formal classroom instruction to informal courses delivered through Massive Open Online Courses (MOOCs) or bootcamps; MOOCs provide access to quality instruction from leading universities worldwide with considerable flexibility in time and place, while bootcamps, typically focused on practical skills such as programming, design, or data science, offer intensive, structured, and highly applied training directly relevant to labor-market needs. Seventh, project-based and collaborative learning, or project-based learning (PBL), has been increasingly adopted across Indonesian schools [26], enabling students to learn through direct engagement with real projects while simultaneously fostering collaborative learning that strengthens social and communicative skills. Eighth, the integration of STEM (Science, Technology, Engineering, and Mathematics) into the curriculum reflects a current government initiative and educational priority aimed at cultivating student interest in these fields while preparing a generation competent in digital and technological domains. Ninth, gamification in learning has grown increasingly popular in Indonesia, employing game elements such as points, levels, and challenges to render learning more engaging and motivating, an approach that has strengthened student engagement and interest through applications and platforms such as Kahoot, Quizizz, Wordwall, and Educandy, among others.

Factors Supporting or Inhibiting Educational Innovation in Indonesia

There exists broad consensus among scholars that innovation within education is far from a straightforward undertaking; rather, it is a considerably complex process. Just as such innovation is shaped by a range of supporting factors, it likewise entails challenges, whether personal, institutional, or socio-cultural in nature, associated with the transformative process of change that innovation implies [27], [28], [30]. With respect to education in Indonesia, the literature reviewed in this study identifies several factors conducive to the success of educational innovation, organized across three levels. At the level of the education system as a whole, the formulation and practical implementation of precise, well-targeted public policy is essential to directing and guiding innovative

action at the level of individual schools or educational centers and their implementation within educational spaces; equally important is the financial support required to cover the costs associated with each educational innovation, including the provision of equipment, the acquisition of teaching materials, teacher training, curriculum redesign, and the maintenance of educational facilities. At the level of the school or educational center, what is required is management genuinely committed to change, capable of directing and encouraging the educational community to engage in the innovation process through teamwork, fostering a positive organizational climate, and promoting a system of continuous evaluation that enables timely feedback and decision-making. At the level of the educational space itself, curriculum renewal is required as part of the innovation process, alongside a teaching staff conscious of the purposes of innovation, one that promotes student autonomy and responsibility for their own learning and that is trained in new teaching methods, particularly those that explicitly incorporate information and communication technology resources [29].

With respect to inhibiting factors, it is important to recognize that not all actors within any given process of innovation possess equal motivation to participate actively. Actors not infrequently exhibit resistance to change, a condition generally understood as reflecting heightened apprehension in the face of the unknown, or arising from distrust toward the indicators of change, or from a perceived sense of threat [30]. This phenomenon has been extensively studied within the fields of occupational psychology and organizational behavior, and is recognized as a broadly common psychological pattern that manifests, to varying degrees, across virtually all individuals. Such resistance, in turn, can influence the success of change initiatives pursued by an organization and carries the capacity to undermine such initiatives, contributing to the failure of innovation projects promoted by management [31].

Guidelines for Public Policy Formulation in the Process of Adopting Educational Innovation in Indonesia

This section proposes a set of guidelines for the formulation of public policy and pedagogical praxis aimed at promoting and developing educational innovation capable of addressing the adverse factors outlined above. Five dimensions are considered.

Building consensus: Public policy represents the outcome of a “pact” between the state and society, one that provides the foundation for realizing change across various sectors, education included. In the early 1990s, a growing conviction emerged that the transformation of education would be attainable only where consensus and commitment existed across all sectors of society. The Declaration of the World Conference on Education for All (WCEFA) explicitly emphasized that new, coordinated, and revitalized action would be required at every level of the process of educational transformation [32]. In other words, the WCEFA Declaration called for coordination between governmental and non-governmental organizations as a whole, together with shared agreement among the various parties involved, as an essential condition for this process.

The process of arriving at educational policy may be described through several related terms, including consultation, agreement, pact, and educational consensus. A

pact, understood as a social agreement reached through consultation, confronts particular challenges insofar as information and knowledge constitute a central axis of power distribution, rendering control over information and its dissemination a principal source of social conflict in the determination of educational policy. The formulation of educational policy must therefore involve transparent debate and negotiation, together with processes that allow for the participation of all parties in establishing clear and equitable rules.

The value of such a pact lies not solely in its final outcome but equally in the process of debate, agreement, and implementation through which it is reached. Within this process, all parties must be able to reach consensus regarding how differences and disagreements are to be resolved, with the explicit aim of avoiding either a single, uncontested vision or a proliferation of disconnected visions. The resulting policy should instead reflect a jointly constructed consensus, one that accommodates a diversity of views while remaining oriented toward shared objectives. Such a pact need not constitute a legally binding instrument; rather, it functions as a procedure consistent with the broader social objective of building a free and democratic society.

Educational policy must accordingly be constructed in a participatory, long-term, and sustained manner, one not bound to the priorities of any particular sector or administration. The intention is for such policy to become a permanent component of national development, contributing to a more democratic political order and to the strengthening of citizenship. Educational policy formulated in this manner is expected to respond to the challenges of social change and to facilitate the emergence of a more inclusive and competitive society.

Adopting a systemic and contextual vision: Education should be understood as a complex system composed of numerous interrelated and interacting components. In practice, however, education is frequently approached in a fragmented and partial manner, an approach that obstructs a genuine understanding of its complexity, multicausality, and interdependence. Achieving comprehensive scientific understanding, together with effective social and political action, requires that education be examined as an integrated whole. The education system encompasses a range of elements, including pedagogy, curriculum, and administration, as well as the actors involved, namely students, families, communities, teachers, school leaders, advisors, officials, and national and international bodies. The education system likewise operates across multiple levels, from the local to the national and international. Education therefore involves not only formal structures but also the processes arising from interaction among individuals and groups, whether academic or administrative in nature.

Change within education must likewise be systemic in character, affecting not only formal structures but also the actors involved, academic and administrative processes, and the relationships and forms of participation that constitute the system. This requires maintaining coherence among the various elements of education so that the relationships between them remain appropriately preserved. Change occurring within one educational

component will inevitably affect other related components, given that the education system functions as an interacting network. Systemic educational change is therefore not confined to the alteration of a single aspect but must encompass comprehensive change across the educational organization as a whole. An approach that integrates change across multiple components in this manner is likely to produce a broader and more thorough impact, generating more effective transformation within education.

Valuing educators: Educators occupy a role of central importance in every process of educational change. Even where public policy or educational innovation has been carefully designed and properly implemented, its effectiveness remains contingent on the capacity and willingness of the individuals responsible for its implementation. Attention to the quality of educators, and to the training they receive, is therefore essential, given their status as the principal actors determining educational success. The literature indicates that the challenges confronting global society and the global economy have positioned education among the foremost subjects of contemporary debate, with teachers recognized as key actors within the education system. Educators are increasingly acknowledged as a primary determinant of educational quality, and studies of successful education systems consistently affirm that the quality of a system depends fundamentally on the quality of its teachers. The literature identifies three essential requirements in this regard: first, identifying individuals suited to the teaching profession; second, training them to a high academic standard using innovative approaches so that they become effective educators; and third, establishing favorable living and working conditions that allow educators to continue developing professionally.

Evidence further suggests that these objectives can be achieved across diverse national and cultural contexts, and that such achievements are attainable within relatively short timeframes, helping to address the challenges facing education systems worldwide. The available evidence indicates that teacher quality constitutes the principal factor driving variation in learning outcomes across schools. Education systems committed to improving instructional quality tend to focus on strengthening teacher-student interaction, developing more effective instructional strategies, providing classroom-based training for teachers, and cultivating leadership capable of facilitating the learning process, alongside efforts to promote constructive feedback among teachers to support their continued professional growth.

UNESCO/OREALC [33] acknowledges that teachers must operate within new scenarios for which they remain insufficiently prepared, underscoring the importance of continued progress in teacher professionalization. In a rapidly evolving world, every professional, teachers included, must continually update their knowledge in order to remain relevant and effective in confronting emerging challenges. As with other professions, a teacher's development does not conclude with formal training but continues to unfold as they enter the profession and apply their knowledge within real-world contexts. Teachers must therefore continually renew and deepen their knowledge in order to respond to a world that is increasingly complex, globalized, and uncertain.

Achieving meaningful change in education accordingly requires sustained attention to the quality of educators and to the processes through which they are trained, with effective education systems positioning teachers as principal agents of change and ensuring they receive the support necessary for continued professional development.

As UNESCO/OREALC [33] notes, the quality of teacher training constitutes a crucial element of an effective education system, encompassing two principal dimensions: initial training provided to prospective teachers and ongoing, in-service training for practicing teachers. This underscores that educational quality depends not only on curriculum content but equally on the quality of teachers and on how they are prepared to meet the demands of the profession.

Consistent with this, Barber and Mourshed [34] advance three central principles underpinning high-performing education systems. The first principle holds that the quality of an education system cannot exceed the quality of its teachers; however well-designed a system may be, the intended outcomes will remain unattainable in the absence of qualified educators, making it essential to ensure that teachers possess adequate competence and strong pedagogical skill. The second principle holds that the only means of improving learning outcomes is to improve the quality of teaching itself, which entails refining methods, approaches, and teacher–student interaction through sustained teacher training and improved classroom instruction, changes from which students benefit directly through more effective learning experiences. The third principle holds that strong system-wide performance requires that all students learn, meaning that the success of an education system is measured not solely by individual achievement but by the proportion of students who attain an adequate standard of learning; every teacher must therefore work to ensure that all students, irrespective of socioeconomic background or prior ability, have an equal opportunity to learn and develop.

In practice, however, conditions within public schools frequently reveal that many teachers come from disadvantaged communities, possess limited educational attainment, and have constrained foundational skills. Many likewise receive minimal training and low compensation, circumstances that adversely affect the quality of instruction they are able to provide, instruction that tends toward traditional methods emphasizing information transmission and rote memorization with limited opportunity to cultivate critical thinking. Teachers are often passive in the face of change and innovation and tend to work individually rather than collaboratively, further compromising the quality of learning through diminished active engagement and limited adoption of innovative approaches.

Although Indonesia has undertaken substantial efforts over the past three decades to strengthen teacher training, available analyses indicate that the classroom-level impact of such efforts has remained limited. Many school leaders and teachers themselves report considerable dissatisfaction with the effectiveness of courses, workshops, compensation-linked programs, and related initiatives; however well-intentioned such programs may be, many have failed to meet expectations for improving instructional practice in ways that sustainably raise student achievement.

Further analysis reveals several notable weaknesses in existing teacher-training formats. One is limited duration, leaving teachers insufficient time to absorb and apply new material in practice. A further weakness concerns the frequent gap between the content delivered in training and the practical needs of schools, complicating the implementation of newly acquired knowledge. Inadequate monitoring and support during implementation likewise constitute a significant obstacle. Hunt [35] adds that much teacher training consists of brief workshops offering limited opportunity for teachers to apply new methodologies in their instruction, coupled with minimal post-training support to ensure that such changes are effectively sustained in the classroom. Improving educational quality therefore cannot rely on teacher training alone. A more comprehensive approach is required, one that ensures adequate training duration, content genuinely aligned with schools' practical needs, and intensive monitoring to confirm that changes in instructional practice are meaningfully realized in the classroom. Through such an approach, sustained improvement in educational quality and stronger student achievement may reasonably be anticipated.

Working within learning communities: The challenges confronting pedagogical practice, together with the social and cultural context of educational institutions, are frequently so extensive and complex that they exceed the capacity of individual teaching staff. In responding to such challenges, a more effective approach lies in thinking and acting collectively, within networks and groups. Collaboration among teachers, together with the integration of individual competencies and skills, enables a more comprehensive response to existing problems. Such an approach creates space for new ideas to emerge through discussion and cooperation, fostering more horizontal relationships both among teachers and between teachers and school leadership. Within this context, complementary perspectives and viewpoints can generate a shared definition of the problems requiring resolution, with each party contributing its own perspective and analysis.

It is equally important to value diversity as a resource that enriches both society and educational institutions. Innovation in education cannot emerge in isolation or fragmentation but arises instead through sustained professional exchange and cooperation. Through the creation of networks or collectives, whether within or across institutions, innovation develops as a product of contrasting and enriching perspectives. Such cooperation must likewise extend to relationships with families and among students themselves, given that collaboration involving all relevant parties yields deeper understanding and more effective solutions.

One significant theme concerns the movement toward encouraging collaboration, particularly through networks, between schools and teachers, aimed at debating pedagogical dimensions and sharing experience. A World Bank [36] report highlights the importance of building alliances and coordinating the various actors within an education system to promote learning, an objective that may be pursued through exchange networks, meeting spaces, and joint publications that enable broader discussion and knowledge-sharing among educators.

According to Escudero [37], a learning community constitutes a form of training and support in which a group of individuals and institutions sharing a common interest in improving their practice develop mechanisms for sharing experience and knowledge. Such communities are oriented toward generating innovation, building capacity, and improving practice through sustained and cooperative interaction. Within a learning community, problem-solving occurs collectively, integrating diverse perspectives into shared solutions. This methodology supports creativity and innovation while recognizing diversity as a source of strength. Learning communities likewise share ideas and resources and collaborate in the implementation of joint projects; in short, learning communities or networks represent an organized alternative for sustained learning and the development of innovation.

Meeting the challenges confronting education therefore requires collaboration among the various parties involved, including teachers, students, families, and other educational institutions, as the key to generating meaningful change. Such collaboration is likely to produce more effective innovation and sustained capacity development, ultimately contributing to the overall improvement of educational quality.

Leveraging information and communication technology: Scientific discovery and technological innovation have exerted a profound influence on the development of humankind. From the invention of writing, printing, the telephone, radio, and cinema to television, technology has played a central role in social and cultural transformation. Among the more significant technological developments is information and communication technology (ICT), which encompasses the full range of services, applications, and technologies employing hardware and software, typically transmitted through telecommunications networks [38]. This technology integrates computing, microelectronics, and telecommunications knowledge, enabling the search, storage, processing, management, retrieval, production, and dissemination of diverse forms of content through various technological media, whether acoustic, optical, or electromagnetic in nature [39]. ICT therefore plays a fundamental role in shaping contemporary society and culture, with effects extending across virtually every domain of life, in every country, and for every individual.

One defining characteristic of the information society is the development of knowledge networks that enable the exchange of information across barriers of space and time. This process of internationalization affects the flow of data, information, knowledge, and experience, as well as the movement of people, products, and services. These changes, in turn, influence the comprehensive restructuring of education systems, creating opportunities for individuals to realize their potential within an environment characterized by rapid social, economic, and technological change.

As in many other domains, however, the use of ICT in education gives rise to differing views. For Briones [39], the term technophilia refers to an unqualified faith in technology, one that emphasizes its positive dimensions and regards it as a “solution to educational problems.” Proponents of this view argue that adequate digital infrastructure is increasingly essential to supporting a substantial leap forward in

knowledge generation, and that integrating technology into education systems can help ensure improved educational quality. The principal advantages associated with ICT include its capacity to facilitate long-distance communication, to provide access to abundant and varied information, and to enable the development of activities and operations through networked platforms; ICT further holds potential for generating new employment within the telecommunications sector and for supporting business promotion and entrepreneurial activity.

Notwithstanding these considerable benefits, it is important to recognize that the application of technology in education cannot resolve every existing challenge. Its implementation must be carefully considered and adapted to the needs and circumstances of each educational institution. Applied appropriately, ICT can nonetheless serve as an effective instrument supporting learning and development within the information age. Brunner [40] similarly identifies several ways in which ICT may enrich the educational process, including its capacity to support the visualization of abstract procedures in a clearer manner, thereby facilitating the understanding of difficult concepts. ICT may likewise facilitate diagnostic work through more frequent and sophisticated evaluation, allowing for more precisely targeted instruction for students requiring particular attention. Technology of this kind further plays a role in supporting slower learners, functions as a memory aid, and offers opportunities for students to explore material across time and context. One notable advantage of ICT lies in enabling students to repeat learning activities at their own pace, thereby strengthening their understanding of the material; ICT may likewise enhance student motivation through personalized program design while fostering teamwork and collaborative skill development.

At the same time, there exists a more skeptical position, referred to as technophobia, which questions or rejects the potential of technology in education. Adherents of this view emphasize the various risks and negative consequences associated with technology use, including its perceived dehumanizing effects and the potential for commercial interests to threaten both democracy and the education of future generations. Technology, in this view, is regarded as a threat capable of eliminating employment, eroding tradition, reducing opportunities for face-to-face interaction, and potentially undermining conscience itself; adherents further suggest that technology risks reducing individuals to mere instruments controlled by economic and political interests, thereby diminishing individual freedom and deeper social relationships.

Among the fundamental promises or expectations associated with the use of ICT in education, this study identifies the following: that younger generations acquire the technology-based skills and competencies required to integrate into an increasingly technology-organized society, commonly referred to as digital literacy; that the digital divide between individuals and social groups is reduced through the provision of universal access to computers and the internet; and that educational practice and student academic achievement are enhanced through changes in teaching and learning strategies.

As Lugo [41] observes, information and communication technology does not constitute an instant solution to every educational problem but rather represents a window of opportunity capable of opening pathways for innovation across multiple dimensions of education. ICT offers opportunities to improve knowledge management, teaching strategies, institutional configuration, and the roles of both teachers and students. It is nonetheless essential to understand that the use of ICT in education cannot be regarded as a panacea capable of resolving every existing challenge; rather, ICT constitutes a tool that, when appropriately deployed, can support meaningful change and improvement within the education system.

The considerable potential of ICT can support sustainable social development through education; realizing this potential for innovation, however, requires that the use of ICT be understood within a broader context, particularly the social and cultural context specific to each country. In this regard, ICT must be leveraged to help reduce socioeconomic, educational-cultural, and technological disparities between nations, consistent with UNESCO's [42] Education for All (EFA) proposal, which advocates the affordable implementation of ICT in support of this objective. UNESCO emphasizes that although ICT holds substantial potential for disseminating knowledge, enhancing learning, and developing more efficient educational services, this potential can be fully realized only where technology is deployed in support of sound educational strategy rather than the reverse. In developing countries especially, ICT must therefore be integrated with more traditional educational methods, such as the use of books and radio, and applied more broadly within teacher training.

Within the broader literature on education, particularly that addressing the integration of ICT as a resource for improving educational quality, equity, and relevance, many scholars emphasize that the integration of technology alone is insufficient to meaningfully improve educational quality. As Coll and [43] argue, achieving improved educational outcomes requires a deeper process of innovation within the education system itself; the integration of ICT must form part of genuine transformation across the education system, generating substantive impact on every component of education. Such transformation is ultimately intended to cultivate citizens prepared for lifelong learning and democratic life, in keeping with the demands of twenty-first-century society.

CONCLUSION

Fundamental Finding : Educational innovation is a fundamental factor in improving educational quality, but its effectiveness in the Indonesian context is inseparable from considerable complexity and difficulty. **Implication :** A set of public policy guidelines is proposed to develop educational innovation by building consensus among key societal actors, adopting systemic and contextualized visions, empowering educators through professional support, fostering learning communities, and fully realizing the pedagogical potential of ICT to narrow the gap between societal demand and educational change while cultivating a culture of innovation. **Limitation :** These guidelines are currently offered as theoretical proposals and recommendations rather

than proven, universally applicable blueprints. **Future Research** : The proposed action guidelines need to be implemented, further developed, and evaluated in real-world practice across diverse educational contexts.

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