

Lifelong Learning as a Strategic Framework for Human Resource Development, Digital Literacy, and Sustainable Education in the Era of Global Transformation

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Abstrak

Pembelajaran sepanjang hayat menjadi kunci untuk meningkatkan kualitas sumber daya manusia, adaptasi terhadap perubahan, dan pencapaian pembangunan berkelanjutan. Tulisan ini menggunakan studi literatur sebagai pendekatan penelitiannya. Mengelaborasi secara sistematis tentang sekolah, pendidikan sepanjang hayat, pendidikan formal, nonformal dan informal yang bersumber dari jurnal, dan buku guna mengetahui tentang kerangka pendidikan sepanjang hayat. Pendidikan sepanjang hidup, merupakan suatu sistem, mencakup seluruh proses kegiatan pembelajaran yang berlangsung sepanjang hidup manusia. Konsep ini bertujuan untuk menciptakan individu dan masyarakat yang lebih baik, serta menjadi proyek besar dalam masyarakat modern yang hidup didalam dunia yang terus berubah serta penuh informasi. Pendidikan sepanjang hayat sangat penting dalam membantu manusia untuk terus beradaptasi dengan perubahan yang terjadi. Pendidikan seumur hidup, yang juga dikenal dengan istilah Life Long Education, merupakan pendidikan yang menekankan suatu proses belajar dilakukan terus-menerus dari saat seseorang lahir sampai meninggal, yang dapat dilakukan juga lewat pendidikan formal, non-formal, maupun informal. Pendidikan sepanjang hayat merupakan konsep penting yang menekankan bahwa proses belajar tidak berhenti pada pendidikan formal, melainkan berlangsung seumur hidup melalui jalur formal, nonformal, dan informal.

Kata Kunci: *manusia; pembelajaran; pendidikan; sepanjang hayat*

Abstract

Lifelong learning is the key to improving human resource quality, adapting to change, and achieving sustainable development. This paper employs a literature study approach, systematically elaborating on schools, lifelong education, and formal, non-formal, and informal learning based on journals and books to understand the framework of lifelong education. Lifelong learning is a comprehensive system encompassing all learning activities that occur throughout human life. The concept aims to create better individuals and societies while serving as a major project in modern communities living in an ever-changing and information-rich world. Lifelong education plays a vital role in helping people continuously adapt to change. Also known as Life Long Education, it emphasizes continuous learning from birth to death through various educational pathways, formal, non-formal, and informal. Thus, lifelong learning underscores that education does not end with formal schooling but continues throughout life across multiple modes of learning.

Keywords: *education; human; learning; lifelong.*

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Introduction

Lifelong learning is an educational paradigm emphasizing that the process of learning does not end with formal education but continues throughout one's life. This concept emerges as a response to global change, scientific and technological advancement, and the dynamic demands of the labour market. Accordingly, lifelong learning becomes a key instrument for enhancing human resource quality, enabling adaptation to change, and achieving sustainable development. The rapid evolution of technology and the rise of the knowledge economy have transformed how people learn and work, necessitating continuous skill renewal to remain competitive. As noted by UNESCO (2022), lifelong learning fosters the development of self-directed learners who can flexibly adapt to social, technological, and economic transformations in the 21st century. It also aligns with global sustainable development goals by ensuring inclusive and equitable education opportunities for all individuals regardless of age, background, or socio-economic status (UNESCO, 2022).

In Indonesia, the concept of lifelong learning is embedded in Law No. 20 of 2003 on the National Education System, which mandates that every citizen has the right to continuous learning throughout life. This policy highlights that education should not only be institutional but also community- and technology-based, creating a comprehensive ecosystem that integrates formal, non-formal, and informal learning. Community-based education plays a vital role in developing social character, collective values, and civic participation, while digital technology such as online learning platforms and social media, expands access to educational opportunities and supports collaborative learning models (Isabella, 2024). Nevertheless, Indonesia still faces structural challenges in implementing this vision. The country's digital literacy index remains below the global average, reflecting disparities in digital access, online safety awareness, and the ability to utilize digital tools effectively for learning (Afrina et al., 2024). Such disparities hinder the growth of a robust learning society capable of navigating the complexities of globalization and digital transformation.

Furthermore, the success of lifelong learning depends on strengthening digital competencies and cultivating a culture of continuous learning among citizens. A strong digital literacy foundation enables individuals to access, evaluate, and produce knowledge effectively, transforming them from passive consumers into active creators of information (Sari et al., 2024). Research has demonstrated that improving digital skills directly correlates with increased engagement in lifelong learning activities and improved employability outcomes (Zakir et al., 2025). However, in Indonesia, challenges such as limited internet penetration, uneven access to educational technology, and the absence of a coherent lifelong learning policy framework continue to impede progress. Addressing these issues requires multi-stakeholder collaboration between the government, educational institutions, private sectors, and communities to create inclusive digital ecosystems that empower citizens to learn continuously. As noted by the Teachers College of Columbia University (2025), closing the digital divide is essential not only for achieving educational equity but also for ensuring that all individuals can fully participate in the digital economy and contribute to national development.

In Indonesia, Law No. 20 of 2003 (Sisdiknas) establishes the principle that every citizen has the right to lifelong education, emphasizing the state's obligation to provide continuous learning opportunities for all. In the digital era, this vision requires education to go beyond the confines of formal institutions and evolve into a community-based learning system that integrates moral, social, and technological dimensions. Community-based education serves as a platform for internalizing social values, nurturing civic responsibility, and shaping national character, while technology functions as both an enabler and equalizer in broadening access to education. The use of digital tools, including social media platforms, crowdfunding mechanisms, and open learning systems, facilitates not only the dissemination of knowledge but also the mobilization and transparent management of educational resources. Such integration of digital technologies strengthens social participation and collective ownership of education, aligning with Indonesia's broader goal of building an inclusive and sustainable learning society.

However, the transition toward a digitally enabled learning society remains hindered by structural and systemic challenges. The low level of digital literacy among Indonesians represents a key barrier to realizing lifelong learning initiatives effectively. Studies indicate that limited infrastructure, low bandwidth quality, and uneven access to digital devices continue to restrict the implementation of

equitable education, particularly in rural and remote regions (Afrina, Zulaikha, & Jumila, 2024). Although the government has initiated programs to enhance digital literacy, many of these efforts focus on basic digital use rather than higher-order digital competencies such as information evaluation, creative production, and ethical engagement (Digital Literacy of Rural Areas in Indonesia, 2023). Furthermore, a diagnostic study by the Smeru Research Institute (2022) found that the absence of systemic incentives for upskilling and lifelong learning has led to stagnation in digital transformation efforts, particularly within the education sector. These findings suggest that while digitalization is progressing, it is not yet underpinned by a strong culture of lifelong learning and digital empowerment at the grassroots level.

Empirical data underscore the urgency of addressing these disparities. Indonesia's national digital literacy index, as reported by the Ministry of Communication and Informatics, rose to 3.54 in 2022 a modest improvement but still below the global standard, reflecting persistent deficiencies in digital skills, digital culture, and cybersecurity awareness (ANTARA, 2023). Moreover, the digital divide remains significant: more than 26 percent of Indonesians still lack internet access, and many schools, especially in rural areas, remain disconnected from reliable digital infrastructure (Teachers College, Columbia University, 2025). These challenges not only limit access to digital learning resources but also weaken individuals' capacity to develop critical thinking, communication, and language mastery skills essential to navigating global competition. As such, fostering lifelong learning in Indonesia's digital era requires a coordinated policy framework that prioritizes infrastructure development, inclusive access, and digital capacity-building as foundations for an equitable and future-ready learning ecosystem.

Methods

This paper employs a literature study as its research approach. It systematically elaborates on schools, lifelong education, and the dimensions of formal, non-formal, and informal education based on journal articles and books to understand the framework of lifelong education.

Result and Discussion

A. Definition of Lifelong Education

Lifelong education is a comprehensive and dynamic system that integrates every learning experience an individual encounters from birth to death. It is grounded in the understanding that education is not a one-time event confined to the classroom but rather a continuous and evolving process that shapes human development across all stages of life. This concept extends beyond the boundaries of age, occupation, and social class, recognizing that learning can occur in diverse environments schools, workplaces, communities, and even within families.

At its core, lifelong education seeks to cultivate individuals who are intellectually, emotionally, socially, and morally developed. It supports the creation of a knowledgeable and resilient society capable of facing the challenges of globalization, technological transformation, and cultural shifts. In modern societies characterized by rapid change and information abundance, lifelong learning functions as a strategic mechanism for maintaining relevance, competitiveness, and human adaptability. It not only prepares individuals to meet the evolving demands of the labor market but also empowers them to contribute meaningfully to civic life and community well-being.

The philosophy underlying lifelong education emphasizes self-directed and autonomous learning, where individuals take responsibility for their personal and professional growth. This notion aligns with the idea that knowledge and skills must be continuously updated to keep pace with scientific and technological advancements. Formal education delivered through schools and universities serves as the foundation, while non-formal and informal education provide complementary pathways for ongoing learning. Non-formal education includes structured learning outside formal institutions, such as community workshops, vocational training, and online courses. Informal education, on the other hand, occurs through daily interactions, experiences, and self-reflection.

Furthermore, lifelong education underscores the importance of accessibility and inclusivity in learning opportunities. Every individual, regardless of socioeconomic background, gender, or geographic location, should have the right and ability to pursue education that enhances their quality of life. This perspective aligns with UNESCO's vision of

Education for All, which promotes lifelong learning as a fundamental human right and a key driver of sustainable development.

In essence, lifelong education represents a paradigm shift from viewing education as a finite process to perceiving it as an enduring and holistic journey. It fosters an adaptive, innovative, and empowered citizenry capable of lifelong curiosity, critical thinking, and collaboration in an ever-evolving world.

B. Implications of Lifelong Education

The implications of lifelong education extend far beyond the traditional boundaries of schooling, encompassing various dimensions of human development, social participation, and economic empowerment. According to Marfu'ah (2021), the implementation of lifelong learning manifests through multiple educational domains that collectively support the growth of informed, skilled, and responsible individuals. Each category reflects how education, when sustained throughout life, contributes not only to personal advancement but also to societal transformation.

1. Functional Literacy Education

Functional literacy education represents the foundation of lifelong learning, particularly in developing nations where literacy gaps remain significant. It moves beyond the mere ability to read and write, emphasizing the functional use of literacy in daily life such as understanding health information, managing finances, interpreting digital content, and engaging in civic participation. In many communities, media consumption habits have shifted toward passive engagement through television, radio, and social media, often at the expense of reading comprehension and critical thinking. Therefore, functional literacy programs are essential to restore and strengthen these competencies.

The implementation of such programs involves two key strategies: first, equipping learners with practical literacy and numeracy skills that are directly applicable to their personal and professional contexts; and second, providing accessible and contextually relevant reading materials that encourage continuous learning. In essence, functional literacy education empowers individuals to navigate the complexities of modern life, make informed decisions, and participate meaningfully in economic and social activities.

2. Vocational Education

Vocational education serves as a bridge between academic learning and the labor market, offering practical training that enhances employability and productivity. Within the framework of lifelong education, vocational learning is designed not only for young learners but also for adults seeking to upgrade or diversify their skills. Such programs are particularly significant in societies experiencing industrial transformation and workforce displacement due to automation and digitalization.

By offering both formal and non-formal learning pathways, vocational education provides flexibility and inclusivity. It helps individuals who may not have completed formal schooling to acquire technical expertise and professional competence, enabling them to re-enter the workforce or start their own enterprises. Moreover, vocational programs contribute to national development by addressing skill shortages, supporting innovation, and fostering a culture of continuous professional growth.

3. Professional Education

Professional education reflects the institutionalization of lifelong learning within occupational and professional domains. In this context, education is not confined to initial qualification but is embedded as a continuous process of renewal and

adaptation. The so-called *built-in mechanism* within professional development ensures that practitioners remain updated with evolving methodologies, technologies, and ethical standards.

For example, in sectors such as healthcare, education, law, and engineering, professionals are required to engage in ongoing certification, workshops, and training to maintain competence and credibility. This process not only enhances individual expertise but also upholds public trust in professional services. Professional education thus serves as a dynamic feedback system, reinforcing the idea that lifelong learning is integral to sustaining excellence, innovation, and accountability in every field.

4. Education for Change and Development

Lifelong education plays a transformative role in fostering societal change and sustainable development. In the era of globalization, the rapid advancement of science and technology has redefined the way societies operate, communicate, and produce. From mechanized industry to digital economies and space exploration, technological innovation continuously alters the social fabric and demands adaptive human resources.

Education for change and development encourages learners to think critically about global issues such as climate change, inequality, and technological ethics. It equips them with problem-solving skills and global awareness necessary to contribute to progress while maintaining cultural and ethical integrity. This aspect of lifelong education promotes the idea that learning is not only a personal pursuit but also a civic responsibility to support collective advancement and sustainable development.

5. Civic and Political Maturity Education

In democratic societies, civic and political maturity education is essential for nurturing informed and responsible citizens. As access to information expands, people must be able to critically analyze political narratives, exercise their rights, and engage constructively in governance. Lifelong civic education cultivates a sense of belonging, empathy, and accountability among citizens, strengthening the social contract between the state and its people.

Furthermore, this form of education is not limited to formal schooling but continues through community forums, public dialogues, and civic movements. It enables both citizens and leaders to uphold democratic values, respect diversity, and make decisions that prioritize the public good. In this sense, lifelong civic education becomes a cornerstone of sustainable democracy empowering individuals to act with integrity, wisdom, and social consciousness throughout their lives.

In conclusion, the implications of lifelong education span functional, vocational, professional, developmental, and civic dimensions. Together, these domains form a holistic framework that supports the creation of a learning society one that values knowledge as a lifelong pursuit and recognizes education as the foundation for individual fulfillment and collective progress.

C. The Urgency of Lifelong Learning

The urgency of lifelong learning in the 21st century cannot be overstated, as humanity faces unprecedented shifts in technology, economics, social dynamics, and global interconnectedness. The pace of change has accelerated to such an extent that knowledge and skills acquired during formal education often become obsolete within a few years. Therefore,

lifelong learning is not merely a personal choice but a necessity for survival, adaptability, and continuous growth in a rapidly evolving world.

First, the transformation of the labor market underscores the necessity for continuous learning. The rise of automation, artificial intelligence, and digital systems has fundamentally altered the nature of work. Routine and repetitive tasks are increasingly performed by machines, while creative, analytical, and technological skills are in high demand. This phenomenon, often referred to as the Fourth Industrial Revolution, compels individuals to engage in reskilling and upskilling to remain competitive. Those who fail to update their competencies risk marginalization and unemployment. Lifelong learning thus functions as a mechanism for maintaining employability, fostering innovation, and ensuring economic resilience in the face of technological disruption (Tawarniate et al., 2025).

Second, lifelong learning promotes cognitive flexibility and creativity, which are essential for navigating uncertainty. In an environment characterized by volatility and complexity, knowledge alone is insufficient. Individuals must possess the capacity to think critically, adapt quickly, and devise innovative solutions to emerging problems. Continuous learning not only strengthens cognitive agility but also cultivates curiosity and intrinsic motivation. It transforms learning from a formal obligation into a lifelong habit, empowering individuals to proactively engage with change rather than react to it. As Sudrajat and Hariati (2021) highlight, sustained learning nurtures an open and reflective mindset, enabling people to approach challenges as opportunities for growth rather than obstacles.

Third, lifelong learning contributes significantly to the enrichment of life beyond the professional sphere. The process of learning nurtures emotional intelligence, empathy, and moral awareness, allowing individuals to develop meaningful relationships and social cohesion. It also supports mental health and personal fulfillment by providing a sense of purpose and accomplishment. Through continuous learning, individuals refine not only their intellectual abilities but also their character, resilience, and sense of belonging. In this regard, lifelong learning aligns with the broader humanistic goal of education to cultivate well-rounded individuals who contribute positively to society.

Fourth, the digital revolution has expanded the accessibility of education in ways previously unimaginable. The proliferation of online learning platforms, open educational resources (OER), and virtual classrooms has democratized access to knowledge, breaking down barriers of geography, cost, and time. Digital technologies empower learners to engage in self-paced and personalized education, enabling inclusion for marginalized groups such as women, rural populations, and persons with disabilities (Sudrajat & Hariati, 2021). However, this democratization of learning also requires the development of digital literacy skills to ensure that individuals can critically evaluate and effectively use online information.

Finally, the urgency of lifelong learning in Indonesia and other developing countries is deeply embedded in national strategies for human resource development. As outlined in Indonesia's educational policies, learning is envisioned as a lifelong process that extends beyond formal institutions to include families, communities, and workplaces. The National Education System Law (Sisdiknas) underscores education as a means to achieve equitable and sustainable national progress. Lifelong learning thus becomes a cornerstone of human capital development, social mobility, and national competitiveness in an increasingly globalized world.

In summary, lifelong learning is both an individual and societal imperative. It enables people to adapt to technological changes, fosters personal growth, and sustains collective progress. Without it, societies risk stagnation and inequality; with it, they cultivate resilience, innovation, and the ability to thrive amid change.

D. The Crucial Role of Lifelong Education in the Digital Era

In the digital era, lifelong education assumes an even more critical role in shaping a learning-oriented society capable of responding to the complexities of globalization and technological transformation. The fusion of information technology and education has redefined how individuals acquire, process, and apply knowledge. Lifelong education in this context is not merely an academic endeavor but a cultural movement that promotes continuous intellectual growth and digital adaptability across all stages of life.

Law No. 20 of 2003 on the National Education System (Sisdiknas) explicitly recognizes the right of all Indonesian citizens to lifelong education. This principle aligns with global educational frameworks such as UNESCO's Sustainable Development Goal 4, which emphasizes inclusive and equitable quality education and the promotion of lifelong learning opportunities for all. In practice, lifelong education in the digital age includes various non-formal learning pathways, such as literacy initiatives, life skills education, vocational training, women's empowerment programs, and professional upskilling. These programs ensure that education remains relevant and responsive to societal needs while fostering social inclusion and economic empowerment (Payunda et al., 2024).

The digital transformation has also revolutionized the methods and mediums of learning. With the integration of online learning environments, educational technology platforms, and artificial intelligence-based tools, teachers and learners can now engage in more interactive, personalized, and data-driven educational experiences. For educators, technology enhances the delivery of instruction and facilitates innovative pedagogical approaches, while for learners, it expands opportunities for self-directed learning and lifelong exploration. In this regard, technology serves not as a replacement for human interaction but as an enabler of creativity, collaboration, and critical thinking.

However, while digitalization provides new opportunities, it also poses challenges that highlight the moral and social dimensions of education. The abundance of digital information can lead to misinformation, ethical dilemmas, and superficial learning if not managed properly. Thus, character education remains integral to lifelong learning in the digital era. It ensures that learners develop integrity, empathy, and discernment in navigating the vast landscape of information and technology. Education must therefore strike a balance between technological proficiency and moral grounding to produce responsible digital citizens.

Moreover, digital education has restructured societal roles and occupational structures. Many manual or repetitive jobs are disappearing, replaced by automation, while new knowledge-based professions are emerging. This shift underscores the importance of continuous learning for employability and adaptability. Individuals who engage in lifelong learning can more easily transition between careers, seize new opportunities, and contribute to innovation-driven economies.

The digital era also introduces the concept of *Society 5.0*, an advanced human-centered framework that integrates digital innovation with social well-being. This paradigm envisions a society that leverages artificial intelligence, big data, the Internet of Things (IoT), and robotics not merely for efficiency but for improving human quality of life. Within this context, education becomes a transformative force that empowers individuals to harness technology ethically and creatively. Strengthening education and character development within this framework ensures that technological advancement contributes to social justice, sustainability, and national competitiveness.

In conclusion, lifelong education in the digital age represents a convergence of human potential, technology, and moral responsibility. It transforms education into a continuous, inclusive, and adaptive process that equips individuals to thrive amid global uncertainty. By integrating knowledge, skills, and values, lifelong learning becomes the foundation for a resilient, innovative, and ethically grounded society in the era of digital transformation.

CONCLUSION

Lifelong education is an essential concept that emphasizes that the learning process does not end with formal schooling but continues throughout one's lifetime through formal, non-formal, and informal pathways. This paradigm emerged as a response to the challenges of globalization, technological advancements, and the ever-changing dynamics of society and the labor market. Through lifelong education, individuals are able to develop their potential, enhance their skills, and shape their spiritual, social, and intellectual character. This concept carries broad implications, encompassing functional literacy, vocational and professional education, civic education, and community development.

In the digital era, lifelong education has become increasingly urgent due to the ease of access to information and the simultaneous challenge of low digital literacy. Therefore, it is necessary to utilize technology wisely to support a learning society that is adaptive, creative, and productive. The implementation of lifelong education not only contributes to improving the quality of human resources but also strengthens national competitiveness in facing the Fourth Industrial Revolution and the emergence of Society 5.0. Thus, lifelong education serves as a fundamental foundation for sustainable development and for enhancing the quality of life of individuals and society in Indonesia.

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