

## The effect of the knowledge index on the community literacy development index and the level of reading interest: A case study in West Java in 2024

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### ABSTRACT

This study examines the reciprocal relationships between the Knowledge Index (KI), the Community Literacy Development Index (CLDI), and the Level of Reading Interest (LRI) across 27 districts/cities in West Java (2024). Using a quantitative design with Partial Least Squares–Structural Equation Modeling and a conditional process perspective, we test direct and feedback effects among the three constructs. Descriptive statistics indicate substantial variation in literacy development and reading interest across regions. Model fit indices exceed conventional thresholds, supporting the adequacy of the specified structure. The results show that KI has a significant positive effect on both CLDI and LRI, indicating that accumulated schooling and knowledge capital translate into stronger literacy ecosystems and more active reading behaviors. Conversely, both CLDI and LRI exert significant positive effects on KI, evidencing a reinforcing cycle in which richer literacy environments and higher reading engagement further elevate knowledge attainment. These findings highlight a virtuous, bidirectional dynamic: knowledge deepens literacy and reading, while literacy investment and reading practice amplify knowledge. Policy implications include prioritizing integrated literacy programs across the life course, leveraging digital access, and coordinating libraries, schools, and local governments to simultaneously lift ecosystem quality and individual reading practices. The study provides actionable evidence for place-based literacy policy and human capital formation in emerging regions.

**Keywords:** Knowledge Index, Community Literacy Development, Reading Interest, PLS-SEM, West Java, Human Capital

## 1. INTRODUCTION

The interaction between literacy, community development literacy, and reading habits needs to be explored because of their importance in national development and personal well-being. The Knowledge Index reflects the population's educational attainment, which is, in turn, the backbone of the fundamental workforce in a society. According to Maulana Julendra et al. (Julendra et al., 2022), this can be captured through composite indices such as the Knowledge Index, which contains both Mean Years of Schooling and Expected Years of Schooling. A community's literacy level is a barrier to academic and economic knowledge (Risdaliani et al., 2022). Moreover, Lestari et al. (Lestari et al., 2020) put forth that reading, fundamental to learning, contributes to developing imagination, culture, and critical reasoning. Indonesia's literacy rate, ranked 62nd out of 70 countries, highlights the need for improvement (Siregar et al., 2021). Understanding the complex causative factors that influence these terms in West Java, Indonesia, requires an intentional study to create more effective policies and strategies for literacy and knowledge enhancement.

Prior work has shown how reading literacy is multidimensional in Indonesia, involving access to books and resources, teaching methods, digital distractions, and family support or the lack thereof (Sahiruddin & Herminingrum, 2021). Data from 2016 ranked Indonesia 60th out of 61 countries in terms of literacy skills (Dewi et al., 2022). Other studies have established a link between digitized materials and reading interest, indicating that while technology may be a distraction, it can influence reading habits when properly channelled (Atmojo et al., 2022). The Indonesian government has initiated a literacy development program called "Gerakan Literasi Bangsa" to enhance reading skills and inculcate a desire to read among primary school pupils while nurturing character formation through cultures of literacy (Farkhatun, 2020). Nonetheless, data collected by the World Bank in 1998 suggest that Indonesian children had lower reading habits than Filipino, Thai, and Singaporean children (Heriyudananta, 2021). Additionally, World Bank analyses show that Indonesia has a high percentage of school graduates who are functionally illiterate compared to their peers in Vietnam and OECD countries ("Education in Indonesia" 2015). This data highlights the need to focus on reading and deepen the functional literacy level across Indonesia's population.

The 2018 Programme for International Student Assessment (PISA) results showed that Indonesian students' reading literacy is lower than the OECD average. Only 30% of Indonesian students can extract the main ideas and identify important information in texts (Mr. et al., 2018). Faced with these challenges and the changes to the concept of literacy in the 21st century, this study aims to fill the gaps in the interrelationship of the Knowledge Index, literacy development within the community, and reading levels. Shifting attention to the importance of teacher professionalism affects the growing concern of the teaching profession (Imron et al., 2023). Although some studies have analyzed single gaps in these variables, no comprehensive studies have simultaneously analyzed their interactions and feedback. The study is timely with the changes in understanding literacy in the 21st century, where information is easy to obtain, but evaluation and comprehension of the information have become essential skills.

In contrast to earlier studies, this study uses the Hayes SEM process model, which dissects the interplay of the Knowledge Index, literacy development, and reading habits. This model allows for an examination of the effect of educational achievement on literacy and reading activities and the interplay between reading, literacy efforts, and knowledge enhancement. This research narrows the analysis of these relations to West Java in 2024 to provide a contemporary and local perspective, considering sub-regional differences and more recent policy shifts. As stated by Purnamasari et al. (Purnamasari et al., 2021), obtaining information from the Internet is considered a literacy activity because it involves reading, writing, and calculating to get accurate and precise information. The use of digital media in education requires measuring student participation, which is essential for effective teaching and learning (Maryani et al., 2024). Also, the findings of this work will assist policymakers, educators, and community stakeholders with designing focused programs aimed at literacy and instilling reading habits that respond to the 21st-century".

## 2. METHOD

The data used in this study were obtained from Statistics Indonesia (BPS) in West Java. The research variables are listed in Table 1.

Table 1. Research Variables

Variable	Unit
Knowledge Index (KI)	Points
Community Literacy Development Index (CLDI)	Points
Level of Reading Interest (LRI)	Points

### 2.1 Operational Definitions of Variables

Operational definitions specify the procedures and indicators used to measure variables in a study. The following definitions are based on the methodologies of BPS-Statistics Indonesia) and the National Library of Indonesia: (a) Knowledge Index (KI). The KI is a composite index designed to measure the level of knowledge and skills in a population. It is a fundamental dimension of the Human Development Index (HDI) and a key pillar of the Knowledge Economy Index (KEI). Operationally, BPS measures the Knowledge Index using two primary indicators: Mean Years of Schooling (MYS) and Expected Years of Schooling (EYS); (b) Community Literacy Development Index (CLDI). CLDI, known in Indonesia as Indeks Pembangunan Literasi Masyarakat (IPLM), is a composite measure developed by the National Library of Indonesia to map the comprehensive state of literacy in a region. Although often analyzed alongside BPS data, its primary source is a specialized national study. The CLDI is constructed from seven key components grouped into two major dimensions: Dimension of Resource Availability (Supply Side) and Dimension of Community Engagement (Demand Side): This measures the population's literacy skills and activities; (c) Level of Reading Interest (LRI). LRI or Tingkat Kegemaran Membaca (TGM) is an index that specifically quantifies the frequency, duration, and preferences related to reading activities within a population. Like the CLDI, it is derived from a specialized study by the National Library of Indonesia, which often utilizes foundational data from the National Socio-Economic Survey (Susenas) conducted by BPS. In essence: If the CLDI represents the broader literacy ecosystem, the LRI measures the actual "activity level" within that ecosystem, focusing directly on the behavioral patterns of reading.

The analysis technique used is quantitative, examining the influence between variables (Sugiyono, 2019). The partial least squares technique is used in the study to observe both direct and indirect influence between variables (Ghozali & Latan, 2015). In the SEM model, the analysis process was conducted in two primary stages. The first stage involves evaluating the measurement model (outer model) to ensure the validity and reliability of the indicators. The second stage is the evaluation of the structural model (inner model), where a series of model appropriateness tests is performed. Because secondary data were used and each variable consisted of only one of four indicators, the analysis included model appropriateness tests ( $R^2$ ,  $Q^2$ , and Gof) and hypothesis tests (Hair et al., 2016). The model uses process technology SEM (Hayes, 2013). The framework of this study is shown in Figure 1.

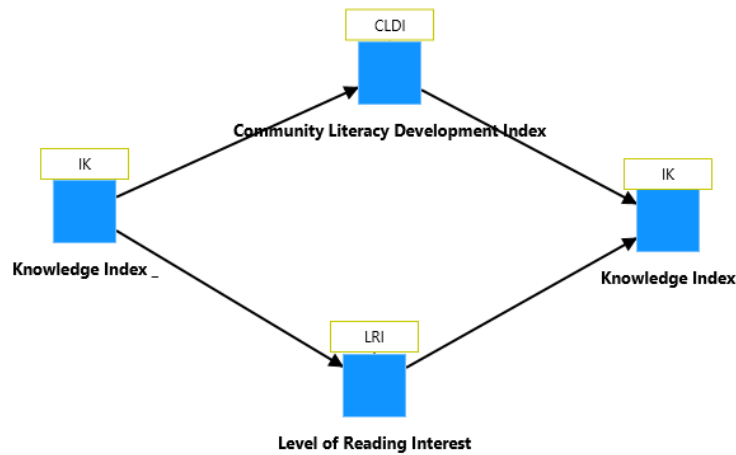


Figure 1. Research Framework of Mind

The research hypotheses are as follows: (1) Knowledge Index (KI) has a direct and significant positive effect on the Community Literacy Development Index (CLDI); (2) Knowledge Index (KI) has a direct and significant positive effect on the Level of Reading Interest (LRI); (3) Community Literacy Development Index (CLDI) has a direct and significant positive effect on the Knowledge Index (KI); and (4) Level of Reading Interest (LRI) has a direct and significant positive effect on Knowledge Index (KI).

### 3. RESULT AND DISCUSSION

#### 3.1 Result

This study begins with an overview of the research variables. The average Community Literacy Development Index was 70.138 points, with the lowest score of 44.590 points in Cianjur and the highest score of 95.37 points in Cirebon. The average Level of Reading Interest was 74.391 points, with the lowest score of 57.03 points in Subang and the highest score of 91.790 points in Bogor City. The average Knowledge Index was 65.602 points, with the lowest score of 57.390 points in Indramayu and the highest score of 78.580 points in Bekasi City. See table 2 for detail.

Table 2. Descriptive Analysis of Research Variables

Variable	Mean	min	max	sd
Community Literacy Development Index (CLDI)	70.138	44.590	95.370	11.746
Level of Reading Interest (LRI)	74.391	57.030	91.790	8.122
Knowledge Index (KI)	65.602	57.390	78.580	6.654

Furthermore, the goodness of fit of the model is presented in Table 3. The  $Q^2$  value of 0.525 and the Gof value of 0.466 are greater than the reference value of 0.38, indicating that the model is appropriate.

Table 3. Model Goodness of Fit Testing

Variable	R <sup>2</sup>	1-R <sup>2</sup>
Community Literacy Development Index (CLDI)	0.223	0.613
Level of Reading Interest (LRI)	0.132	0.602
Knowledge Index (KI)	0.296	0.564
$(1 - R_1^2)(1 - R_2^2) \dots (1 - R_4^2)$		0.475
$Q^2 = 1 - (1 - R_1^2)(1 - R_2^2) \dots (1 - R_4^2)$		0.525
$Gof = \sqrt{AVE * R^2}$		0.466

The coefficient of determination (R-squared) value can be interpreted for each equation. The Knowledge Index (KI) explained the variation in the Community Literacy Development Index (CLDI) by 22.3 percent and Level of Reading Interest (LRI) by 13.2 percent. Community Literacy Development Index (CLDI) and Level of Reading Interest (LRI) explained the variation in Knowledge Index (KI) by 29.6 percent. Next, hypothesis testing is carried out. Table 4 shows the direct influence between variables.

**Table 4. Hypothesis Testing**

Direct effect	coef	se	t stat	P values	conclusion
Knowledge Index _ -> Community Literacy Development Index	0.833	0.351	2.371	0.009	significant positive
Knowledge Index _ -> Level of Reading Interest	0.443	0.216	2.056	0.02	significant positive
Level of Reading Interest -> Knowledge Index	0.227	0.103	2.202	0.014	significant positive
Community Literacy Development Index -> Knowledge Index	0.235	0.095	2.476	0.007	significant positive

The interaction between literacy, community development literacy, and reading habits needs to be explored because of their importance in national development and personal well-being. The Knowledge Index reflects the population's educational attainment, which is, in turn, the backbone of the fundamental workforce in a society. According to Maulana Julendra et al. (Julendra et al., 2022), this can be captured through composite indices such as the Knowledge Index, which contains both Mean Years of Schooling and Expected Years of Schooling. A community's literacy level is a barrier to academic and economic knowledge (Risdaliani et al., 2022). Moreover, Lestari et al. (Lestari et al., 2020) put forth that reading, fundamental to learning, contributes to developing imagination, culture, and critical reasoning. Indonesia's literacy rate, ranked 62nd out of 70 countries, highlights the need for improvement (Siregar et al., 2021). Understanding the complex factors of causation that influence these terms is essential.

### 3.2 Discussion

The study's evidence supports a bidirectional relationship, wherein the knowledge index positively correlates with the literacy development index and reading habits, while the latter two also positively drive the former. This relationship highlights the dynamics of developing an informed citizenry. Regarding cognitive development and social learning theories, knowledge acquisition and literacy skills are obtained through a synergy of approaches (Wijayanti et al., 2024). The profound ability to obtain new information and the scope of pre-existing knowledge enhance the inclination towards reading and literacy skills. In turn, the deepening of literacy and reading activities augments the integration of additional new information, thus nourishing the ever-growing cycle of intellectual prosperity. This result is important for gaining academic attention and strategically redirecting industry investment and policy planning to develop a knowledge-based economy.

The effects of the knowledge index on the literacy development index and reading habits can be viewed as positive because of certain mechanisms in cognitive psychology and educational theory. Knowing more facts enables individuals to understand complex texts, appreciate different perspectives, and think critically, thereby enhancing their literacy skills (Risdaliani et al., 2022). Moreover, knowledge is an effective intrinsic motivator that ignites interest and a desire for continuous learning, fostering a habit of regular reading. This result fits motivation and self-efficacy research that claims people are more inclined to take up activities they consider competent to perform and are already endorsed by their knowledge and interest (Liu et al., 2022).

On the other hand, the effect of the literacy development index and reading habits on the knowledge index is positive because literacy skills offer ways of obtaining and processing information. Skilled readers can access and navigate various texts, identify relevant information, and organize them into

meaningful knowledge structures. In addition, reading introduces people to new ideas, perspectives, and experiences, expanding their cognitive capabilities and stimulating their intellectual growth. This result is corroborated by research highlighting the importance of teaching reading as a skill in a foreign language, particularly because most scientific literature is published in English (Erya & Pustika, 2021).

It is important to analyze and integrate relevant theoretical constructs and empirical evidence from the literature to strengthen the rationale for these findings. Cognitive Flexibility Theory (Eshet-Alkalai, 2012) stresses the significance of understanding multifaceted branching thinking skills and constructing meaning regarding complex phenomena. This theory postulates that individuals with advanced literacy skills tend to be more adaptable and can view issues from various contexts and perspectives, making knowledge acquisition and its application easier. Research on literacy also posits that literacy develops within a society when the motivation of an individual or group to use literacy for a meaningful purpose meets the willingness of the society to provide instruction (Langer, 1988). These findings emphasize that literacy should not only be viewed as a collection of technical skills to be mastered, but rather as a multifaceted dynamic system involving the construction of knowledge and social interaction (Li, 2022).

#### **4. CONCLUSION**

Based on the study's results, it is clear that there is a cyclic dependency between knowledge and literacy and reading habits, as they mutually support one another, leading to enhanced societal development. Based on these observations and supporting theoretical analyses, some policy proposals are designed to target government policies, stakeholder activities, and community actions.

Initially, state authorities should allocate resources to develop integrated literacy activities for all age groups, from preschoolers to adults. Such programs should go beyond teaching reading and writing to foster critical analysis, information research, and technology literacy skills needed in the modern world. Education contributes to the achievement of most goals in life. Furthermore, educational bodies and community organizations must work together to instill a reading culture that encourages reading for fun and as a learning tool. All governments and stakeholders must use technology to improve literacy and promote reading. Summarily, as the research results were presented, the relationship between knowledge, literacy, reading, and the progress of society is emphasised as a whole. The mutual dependence of these factors underscores the importance of proactively addressing education and development in a more integrated framework, focusing on literacy, encouraging reading for enjoyment, and cultivating a culture of lifelong learning.

#### **Ethical approval**

Not Applicable.

#### **Informed consent statement**

Not Applicable

#### **Authors' contributions**

PRS contributed to the methodology, investigation, data curation, and writing of the original draft. AMA contributed to the conceptualization of the study. MH contributed to the formal analysis, validation, writing review and editing, and supervision. IA conducted the literature review and theoretical framework development. LJA contributed to project administration and final manuscript approval.

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The authors declare no conflict of interest.

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