



# SATYA SUSTAINABILITY BRIEF

No. 1, July 2024

## Interventions to Improve Teachers' Data Literacy for Quality Education

Muhammad Fauzan Ansyari

Institut Keberlanjutan Satya, Universitas Islam Negeri Sultan Syarif Kasim Riau, Pekanbaru, Indonesia

### Introduction

Globalisation, technological innovation, and human migration have increased interactions using a common language, with English often serving as this lingua franca (OECD, 2021). English is widely acknowledged as an international language, crucial for global and virtual communication, and is the most used language on the internet (Bokor, 2018). Proficiency in English, defined as the ability to communicate effectively, is advantageous but complex, especially in specialized job requirements (OECD, 2021; Renandya, 2018; Richards, 2017). Both native and non-native English speakers need specialized language proficiency for professional work, such as teaching English or presenting at conferences (Mahboob, 2017; Freeman, 2016; Richards, 2017).

English proficiency brings numerous benefits at personal, institutional, and national levels. Research indicates that English proficiency can lead to better job opportunities, higher educational attainment, and increased income (Araújo et al., 2015; EF, 2021; Jackson, 2014; Tam & Page, 2016). For instance, improved English skills can raise personal income by 40% in the US and 112% in Australia (Bleakley & Chin, 2004; Tam & Page, 2016). Organizations benefit from English proficiency through enhanced economic competitiveness and the ability to attract diverse talent (EF, 2021; Roshid, 2018). Ultimately, these individual and organizational benefits contribute to national economic growth, as seen in Southeast Asia (Pitsuwan, 2014). Given its importance, many countries have made English a mandatory subject in schools or universities (University of Winnipeg, 2022). The OECD Programme for International Student Assessment (PISA) will begin testing English as a foreign language in 2025 to monitor trends (OECD, 2021). Despite the challenges in assessing English proficiency's impact on economic development, the Education First (EF) English Proficiency Index provides valuable insights for policymakers (EF, 2021; Li et al., 2022). This highlights the need for strategic plans to improve English Language Teaching (ELT) to enhance proficiency levels globally.

### Recommendations

- Approach in-service teacher professional development programs with active learning.
- Provide free, flexible professional development using blended models.
- Provide certificates upon completion to incentivize participation.
- Customize professional development programs to address individual teacher needs.
- Provide adequate policy support and resources.

Over the last two decades, data has become essential for continuous improvement and evidence-based education (Mandinach & Schilkamp, 2021). Data, defined as "information," can be qualitative or quantitative, and is categorized into input, outcome, process, and context data (Ikemoto & Marsch, 2007). With advancements in technology, data has become more accessible through systems like EMIS (OECD, 2013). It plays various roles, from showing school performance to stakeholders to shaping policies and improving instructional practices (OECD, 2013; Abdul-Hamid, 2017). Effective data use focuses on student learning and requires data literacy skills among teachers to make meaningful instructional improvements (Mandinach & Schilkamp, 2021). Research indicates that effective data use enhances instruction quality and student outcomes, making it a crucial component of educational reform (Hattie, 2009; Carlson et al., 2011).

To enhance English Language Teaching (ELT) through effective data use, teachers need data literacy for teaching, which enables them to collect, analyze, and interpret various types of data to improve instructional practices and student learning (Gottlieb, 2018; Mandinach & Schilkamp, 2021). This literacy integrates technical data skills with teaching knowledge, including content, pedagogical, and curricular knowledge (Mandinach & Gummer, 2016c; Shulman, 1986, 1987). It allows teachers to make more objective, evidence-based decisions rather than relying solely on intuition and experience, thus better addressing student learning needs (Coburn & Turner, 2011). Given that many teachers lack data literacy, professional development interventions (PDIs) are necessary to develop these essential skills (Mandinach & Schilkamp, 2021).

Professional development programmes are essential for enhancing teachers' data literacy, crucial for effective data use in instructional improvement. In-service teachers often lack adequate preparation for data literacy, as teacher education programs typically focus on assessment literacy (Mandinach & Gummer, 2013; Reeves, 2017). Schools also frequently do not provide necessary support like data coaches (Mandinach & Schilkamp, 2021). Effective PDIs, which should be ongoing and sustained, help teachers develop skills to use data effectively for making informed instructional decisions (Coburn & Turner, 2011; Means et al., 2010). These programs, delivered in-person or online, support teachers in using data to improve teaching and learning, although specific insights into their impact on promoting data use in ELT are still needed (Desimone, 2009; Darling-Hammond et al., 2017).

To continuously improve ELT and student English proficiency, it is essential to not only reform the curriculum but also develop teachers' data literacy for effective curriculum implementation. Professional development should enhance teachers' content knowledge, proficiency, pedagogy, and data literacy, enabling them to make informed decisions for instructional improvement and evidence-based education. Despite the recognized importance of professional development in developing data literacy, many teachers still lack this skill, and there is no clear consensus on its role in supporting data use (Coburn & Turner, 2011; Mandinach & Gummer, 2013; Marsh & Farrell, 2014). Additionally, teachers' characteristics significantly influence their data use practices (Coburn & Talbert, 2006).

## Research Evidence

In recent years, the importance of professional development interventions (PDIs) in enhancing educational outcomes has gained significant attention. As policymakers increasingly recognize the value of data-informed decision-making, there is a growing need to understand how PDIs can effectively build teachers' competencies in data literacy and instructional practices. This policy brief provides evidence on the critical elements of PDIs, their impact on student learning outcomes, and teachers' preferences for online professional development.

A systematic review of the literature on professional development interventions aimed at enhancing data use for instructional improvement identifies key features of effective interventions, including ongoing and sustained training, collaborative learning environments, and the integration of data use into everyday instructional practices. The findings underscore the critical role of teachers' data literacy and the necessity for the interventions to build teachers' competencies in collecting, analyzing, and interpreting data. Additionally, well-designed interventions foster a culture of data-informed decision-making in schools, leading to improved instructional practices and positive student outcomes (Ansyari, Groot, & De Witte, 2020; Ansyari, Groot, & De Witte, 2022).

Another systematic review and meta-analysis of the impact of PDIs on student learning outcomes shows that active learning, relevance to instructional contexts, and sustained duration significantly improve student achievement. The findings also suggest that well-designed and faithfully implemented interventions can enhance student outcomes (Ansyari, Groot, & De Witte, 2022).

In addition, a study exploring teachers' preferences for online professional development (OTPD) programs through a discrete choice experiment identifies key factors influencing teachers' willingness to engage in OTPD, such as interaction mode, learning material mode, learning strategy, duration, certification, and cost. The findings indicate a preference for OTPD programs that offer interactive, flexible learning opportunities, are pertinent to teachers' instructional needs, and provide certification upon completion. This study indicates the potential of OTPD to reach a wider audience and effectively support teachers' professional development and data use practices (Ansyari, Groot, & De Witte, 2022).

## Recommendations

1. **Approach Teacher Professional Development Programs with Active Learning**  
Develop professional development programs that incorporate active learning strategies. These programs should be designed to address real classroom challenges faced by teachers. By focusing on practical, hands-on activities and problem-solving, teachers can directly apply what they learn to their classroom settings, thereby enhancing their instructional practices and student outcomes.
2. **Provide Free, Flexible Professional Development Using Blended Models**  
Implement professional development programs that utilize a blended learning approach, combining both synchronous (real-time) and asynchronous (self-paced) methods. This flexibility allows teachers to participate in professional development at their own convenience, making it easier to integrate into their busy schedules. Blended models also cater to different learning preferences and provide opportunities for interactive and reflective learning experiences.
3. **Provide Certificates Upon Completion to Incentivize Participation**  
Offer certificates upon successful completion of professional development programs to motivate and incentivize teachers to participate. Certification serves as a formal acknowledgment of their efforts and achievements, which can enhance their professional credentials and potentially lead to career advancement opportunities.
4. **Customize Professional Development Programs to Address Individual Teacher Needs**  
Tailor professional development programs to meet the specific needs of individual teachers. This involves understanding and addressing their unique characteristics, such as preferences, data literacy levels, pedagogical knowledge, and attitudes towards data use. Customized programs ensure that professional development is relevant and effective, promoting greater engagement and application of new skills in the classroom.
5. **Provide Adequate Policy Support and Resources**  
Ensure policy support and resources for professional development initiatives. This includes legal endorsement, financial allocation, technical and administrative support, and fostering a collaborative environment among teachers within schools and institutions. Adequate resources and supportive policies are essential for the successful implementation and sustainability of professional development programs, enabling teachers to continuously improve their instructional practices and contribute to the overall quality of education.

## Conclusion

Improving English Language Teaching (ELT) and student proficiency requires not only curriculum reform but also the development of teachers' data literacy. Professional development interventions (PDIs) play a crucial role in this process by providing ongoing, sustained training that integrates active learning and addresses real classroom challenges. Additionally, flexible professional development models, such as blended learning, and the provision of certification upon completion can incentivize teacher participation. Customized PDIs that cater to individual teacher needs and characteristics, along with adequate policy support and resources, are essential for fostering a culture of data-informed decision-making in schools. These strategies collectively enhance instructional practices and contribute to positive student outcomes, making ELT an evidence-based profession.

## References

- Ansyari, M. F., Groot, W., & De Witte, K. (2020). Tracking the process of data use professional development interventions for instructional improvement: A systematic literature review. *Educational Research Review*, 31, 100362. <https://doi.org/10.1016/j.edurev.2020.100362>
- Ansyari, M. F., Groot, W., & De Witte, K. (2022). A systematic review and meta-analysis of data use professional development interventions. *Journal of Professional Capital and Community*, 7(3), 259-289. <https://doi.org/10.1108/JPC-09-2021-0055>
- Ansyari, M. F., Groot, W., & De Witte, K. (2022). Teachers' preferences for online professional development: Evidence from a discrete choice experiment. *Teaching and Teacher Education*, 119(November), 103870. <https://doi.org/10.1016/j.tate.2022.103870>
- Bokor, M. J. (2018). The internet: A platform for language diversity or homogeneity? *Language and Communication in the Digital Age*, 15(3), 23-45.
- Coburn, C. E., & Talbert, J. E. (2006). Conceptions of evidence use in school districts: Mapping the terrain. *American Journal of Education*, 112(4), 469-495.
- Coburn, C. E., & Turner, E. O. (2011). Research on data use: A framework and analysis. *Measurement: Interdisciplinary Research and Perspectives*, 9(4), 173-206.
- Freeman, D. (2016). *Educating second language teachers*. Oxford: Oxford University Press.
- Gottlieb, M. (2018). *Assessing multilingual learners: A month-by-month guide*. Corwin Press.
- Ikemoto, G. S., & Marsh, J. A. (2007). Cutting through the "data-driven" mantra: Different conceptions of data-driven decision making. *Yearbook of the National Society for the Study of Education*, 106(1), 105-131.
- Jackson, J. (2014). Globalization and English in Chinese higher education. *World Englishes*, 33(2), 171-186.
- Lai, M. K., & Schildkamp, K. (2013). Data-based decision making: An overview. In M. K. Lai & K. Schildkamp (Eds.), *Data-based decision making in education: Challenges and opportunities* (pp. 9-21). Springer.
- Mahboob, A. (2017). *The NNEST lens: Non-native English speakers in TESOL*. Newcastle upon Tyne: Cambridge Scholars Publishing.

- Mandinach, E. B., & Gummer, E. S. (2016c). Data literacy for teachers: Making it count in teacher preparation and practice. *Teachers College Record*, 118(10), 1-52.
- Mandinach, E. B., & Honey, M. (2008). *Data-driven school improvement: Linking data and learning*. Teachers College Press.
- Mandinach, E. B., & Schildkamp, K. (2021). Misconceptions about data-based decision making in education: An exploration of the literature. *Studies in Educational Evaluation*, 69, 100865. <https://doi.org/10.1016/j.stueduc.2020.100865>
- Marsh, J. A. (2012). Interventions promoting educators' use of data: Research insights and gaps. *Teachers College Record*, 114(11), 1-48.
- OECD. (2013). *Synergies for Better Learning: An International Perspective on Evaluation and Assessment*. OECD Publishing.
- OECD. (2021). English as a global language: Implications for education policies. *OECD Education Working Papers*, 242, 1-32.
- Pitsuwan, S. (2014). The impact of English on economic growth in Southeast Asia. *Asian Economic Policy Review*, 9(1), 16-27.
- Renandya, W. A. (2018). Language proficiency in second language acquisition. In J. I. Lontas (Ed.), *The TESOL Encyclopedia of English Language Teaching*. Hoboken, NJ: John Wiley & Sons.
- Richards, J. C. (2017). Teaching English through English: Proficiency, pedagogy, and performance. *RELC Journal*, 48(1), 7-30.
- Schildkamp, K., & Kuiper, W. (2010). Data-informed curriculum reform: Which data, what purposes, and promoting and hindering factors. *Teaching and Teacher Education*, 26(3), 482-496.
- Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher*, 15(2), 4-14.
- Shulman, L. S. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review*, 57(1), 1-22.

## EDITORIAL INFORMATION

### About the research

This Satya Sustainability Brief is part of research on teacher professional development interventions to promote data use in education funded by the Ministry of Religious Affairs and Lembaga Pengelola Dana Pendidikan (LPDP) Indonesia.

### Author Biography

Muhammad Fauzan Ansyari is an associate professor at the State Islamic University of Sultan Syarif Kasim Riau, Indonesia, and an affiliated researcher at UNU-MERIT, Netherlands. With a background in English Language Education, Educational Science and Technology, and a PhD from Maastricht University, his research focuses on quality education, digitalization, educational technology, and teacher development. Dr. Ansyari employs interdisciplinary methods, including econometrics and machine learning, and has published extensively in peer-reviewed journals. He has worked with ITU, UNESCO, and UNICEF on digital skills and early learning technology projects and contributed to numerous initiatives in Indonesia to enhance teacher capacity and curriculum development.

### Disclaimer

The views and opinions expressed in this policy brief do not necessarily reflect the official policies or positions of Institut Keberlanjutan Satya, Universitas Islam Negeri Sultan Syarif Kasim Riau.

### Citation

Muhammad Fauzan Ansyari, "Interventions to Improve Teachers' Data Literacy for Quality Education", Satya Sustainability Brief 1 (Pekanbaru: Institut Keberlanjutan Satya, 2024).

Copyright © 2024 Institut Keberlanjutan Satya. All rights reserved.