

Edukacja 2023, 4(167)
DOI 10.24131/3724.230408
e-ISSN 2449-8998

Using Large-Scale Data to Understand and Improve Education

Artur Pokropek / Instytut Badań Edukacyjnych w Warszawie

e-mail: a.pokropek@ibe.edu.pl

ORCID: 0000-0002-5899-2917

Michał Sitek / Instytut Badań Edukacyjnych w Warszawie,
Instytut Filozofii i Socjologii Polskiej Akademii Nauk

e-mail: m.sitek@ibe.edu.pl

ORCID: 0000-0001-9022-6211

Olga Wasilewska / Instytut Badań Edukacyjnych w Warszawie

e-mail: o.wasilewska@ibe.edu.pl

ORCID: 0000-0002-1592-0331

Tomasz Gajderowicz / Instytut Badań Edukacyjnych w Warszawie

e-mail: t.gajderowicz@ibe.edu.pl

ORCID: 0000-0001-5361-0812

This special issue of *Edukacja* is devoted to the analysis of large-scale assessments (LSAs), which play a vital role in monitoring and comparing educational outcomes across populations, contexts, and time. LSAs provide education researchers and policy-makers with an indispensable resource, offering robust empirical data to diagnose systemic challenges, identify inequalities, and design targeted interventions. The volume showcases contributions based on both international LSA programs—such as PISA (Programme for International Student Assessment), TIMSS (Trends in International Mathematics and Science Study), PIAAC (Programme for the International Assessment of Adult Competencies), TALIS (Teaching and Learning International Survey) and ICCS (International Civic and Citizenship Education Study)—as well as national-level assessments inspired by international large-scale assessment, such as TICS (Tests for International Comparisons of Knowledge and Skills). Whether coordinated by organizations like the OECD or the IEA or developed within individual countries, these studies offer complementary perspectives on learners' knowledge, skills, attitudes, teachers' views and practices, and the learning environments.

The included articles reflect a rich diversity of research questions, target groups, and analytical strategies employed in LSA-based research. Analysing TICS 2021, Wrona and Gajderowicz (2023) demonstrate how high school students adjust their learning preferences and classroom expectations as they approach high-stakes exams. Their findings show that students nearing exams prioritize structured and teacher-led instruction, dedicating more time to in-person learning, which suggests heightened efficiency-seeking behaviour under exam pressure.

Another contribution, by Chyl-Tanaś (2023), utilizes PIAAC data to identify risk factors associated with low reading proficiency among adults. The study's findings highlight the significance of educational attainment, early home literacy environments, and the unique challenges adults encounter in everyday reading. Based on these results, a screening approach is proposed to detect those at risk, highlighting the urgent need for targeted adult learning strategies.

Pagliarani's (2023) study, which used TIMSS 2019 data from eight Balkan countries, focuses on bullying, socioeconomic status, and student confidence. The article reveals that students exposed to bullying benefit particularly from higher confidence and supportive backgrounds, whereas systemic school-level variables seem less predictive. Based on these findings, the study emphasizes the importance of personalized, student-centred interventions in conjunction with broader school improvement efforts.

Drawing on data from the International Civic and Citizenship Education Study (ICCS 2022), Wasilewska (2023) examines the environmental attitudes and behaviours of Polish eighth-grade students. The study confirms significant gender differences, indicating that girls have more pronounced pro-environmental orientations. Findings further show that civic knowledge is a strong predictor of engagement on behalf of environmental protection, while the effects of socioeconomic background are more nuanced. The results suggest that education for sustainability must go beyond fear-based messaging and instead cultivate a sense of agency and responsibility, especially among boys and disadvantaged groups.

The contribution of Kaźmierczak, Weremiuk, and Bulkowski (2023) analyses the performance of Polish students in the creative thinking assessment introduced in PISA 2022—the first large-scale international measurement of this competency. Their item-level quantitative analysis identifies specific task types where Polish 15-year-olds, despite overall strong results, scored statistically lower than their OECD peers. These include tasks requiring idea fluency and contextual understanding in social problem-solving scenarios. The findings point to areas where targeted curricular adjustments could further enhance students' creative potential.

The issue also features an analysis by Sitek and Bielecki (2023) of career expectations and readiness among Polish adolescents. Using PISA 2022 data, the study finds notable misalignment between students' aspirations and educational tracks, particularly in vocational education. Socioeconomic status, parental involvement, and mathematics performance are key determinants of this alignment, while the effects of formal career guidance appear to be limited. The authors advocate better-targeted support to reduce inequalities and foster more informed youth decision-making.

Finally, the issue concludes with a secondary analysis of TALIS 2018 data from six Central and Eastern European countries. Paczuska and colleagues (2023) investigate the relationship between school climate, socioeconomic context, teacher job satisfaction, and occupational well-being. The findings highlight the crucial role of relational and organizational factors in promoting teacher retention and well-being. The elements of school climate—particularly participatory leadership, collegial relations, and classroom dynamics—in shaping teacher satisfaction and well-being. Disciplinary problems were a key driver of elevated stress levels, which in turn reduced job satisfaction. By contrast, school socioeconomic status showed only minimal effects.

The articles in this issue reflect the growing methodological sophistication in large-scale assessment research. Authors draw on a wide array of analytical strategies, including discrete choice experiments (Wrona and Gajderowicz, 2023), predictive modelling (Chyl, 2023), multilevel mixed-effects models (Pagliarani, 2023), regression and categorical data analysis (Wasilewska, 2023), mixed-methods (Kaźmierczak et al., 2023), and various applications of structural equation modelling—including multigroup alignment modelling (Bielecki and Sitek, 2023; Paczuska et al., 2023). This diversity highlights the expanding toolkit available to researchers working with complex educational data, reinforcing the need for more nuanced, theory-driven, and context-sensitive approaches.

The contributions demonstrate how large-scale assessment data, whether gathered at the national or international level, can be utilized not only to track trends and identify disparities but also to gain meaningful insights into students' attitudes, preferences, and aspirations. The methodological developments enhance the interpretability of findings but also broaden the potential for informing evidence-based policy across diverse educational systems. These studies reinforce the importance of large-scale assessments as a vital component of evidence-based education policy and practice. Additionally, they raise important questions about data interpretation, comparability, and the complexity of educational outcomes.

REFERENCES

- Chyl-Tanaś, K. (2023). Identyfikacja czynników ryzyka niskiej umiejętności czytania u dorosłych. *Edukacja*, 4(167), 17-31. DOI: [10.24131/3724.230402](https://doi.org/10.24131/3724.230402)
- Kaźmierczak, J., Weremiuk, A., & Bulkowski, K. (2023). Potencjał rozwoju umiejętności myślenia kreatywnego polskich 15-latków na podstawie analizy odpowiedzi uczniów w badaniu PISA 2022. *Edukacja*, 4(167), 42-57. DOI: [10.24131/3724.230404](https://doi.org/10.24131/3724.230404)
- Kutyłowska, K., Sitek, M., Wągrowa, U., Paczuska, K. School climate as a predictor of teacher job satisfaction and occupational well-being: TALIS 2018 evidence from Central and Eastern Europe. *Edukacja*, 4(167), 94-115. DOI: [10.24131/3724.230407](https://doi.org/10.24131/3724.230407)
- Pagliarani, (2023). The interaction between bullying, socioeconomic background and attitudes on educational achievements: Evidence from the Balkan countries with TIMSS 2019 data. *Edukacja*, 4(167), 32-41. DOI: [10.24131/3724.230403](https://doi.org/10.24131/3724.230403)
- Sitek, M., Bielecki, J. (2023). Socioeconomic disparities in career expectations and readiness among Polish adolescents: Insights from PISA 2022 data. *Edukacja*, 4(167), 58-74. DOI: [10.24131/3724.230405](https://doi.org/10.24131/3724.230405)
- Wasilewska, O. Environmental attitudes and behaviours of youth in Poland and their determinants based on ICCS 2022 data. *Edukacja*, 4(167), 75-93. DOI: [10.24131/3724.230406](https://doi.org/10.24131/3724.230406)
- Wrona, S., Gajderowicz, T. (2023). Upcoming high-stakes exams make students eager to choose effective learning strategies and classroom organization. *Edukacja*, 4(167), 1-16. DOI: [10.24131/3724.230401](https://doi.org/10.24131/3724.230401)