WHAT DOES IT TAKE TO IMPROVE LEARNING OUTCOMES AND QUALITY IN EDUCATION IN NORTH MACEDONIA

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ABSTRACT:

Our country faces a declining school-age population, partly due to internal migration to urban centers and external migration of families and young graduates. This situation requires reshaping the educational landscape and finding efficient ways to deliver school services to all. Children's learning experiences across key domains (language, communication, numeracy and science) at early age are inconsistent and of insufficient quality to promote the development of key readiness for school skills and abilities. Results in international student assessments reveal comparatively weak levels of student achievement in primary grades, suggesting that learning deficiencies start early. Gaps that begin in the early years can be hard to close, especially for children who are vulnerable and/or from poorer communities. The education system fails to provide students with the skills they need to successfully complete each stage and move confidently to the next.

Assessing the level of learning outcomes is of outmost priority, in order to enable improved system and capacities for functional and effective data collection and analysis in a harmonized manner (at school, local/municipal and national levels). Educational system has to create effective feedback mechanisms between institutions responsible for assessment and evaluation, on the one hand, and schools on the other, with a particular focus on developing competencies and defining responsibilities in the evaluation process. This will provide efficient identification of challenges, but at the same time guidelines on priority areas for urgent actions and policy measures.

Key words: *learning outcomes, data analysis, quality, equity, knowledge gaps*

Introduction

A quality education system should result in the acquisition of key competences and professional skills that foster people's social responsibility and civic engagement, convey human values, as well as supporting their personal growth and well-being. Each educational system that strives to achieve quality have to collect data and observe trends according to which it can be assessed. In this paper when discussing about quality in education we rely on available data and analysis of learning outcomes and student achievements that reflect system effectiveness in order to provide the core evidence of where the system is failing or succeeding in delivering knowledge and skills. Part of this analysis was made for the IIEP/UNESCO Education Sector Analysis in

North Macedonia (IIEP-UNESCO, 2024) document prepared in cooperation with the Ministry of education and science of North Macedonia. This document contains data from multiple existing student assessments conducted throughout the general education system (e.g. pre-school, primary, secondary) and data and information collected from different sources: national legislation, policy documents, OECD, Eurydice - European Commission, UNICEF, World Bank, Multi Indicator Cluster Survey – MICS, National Examinations Centre, State Statistical Office and others.

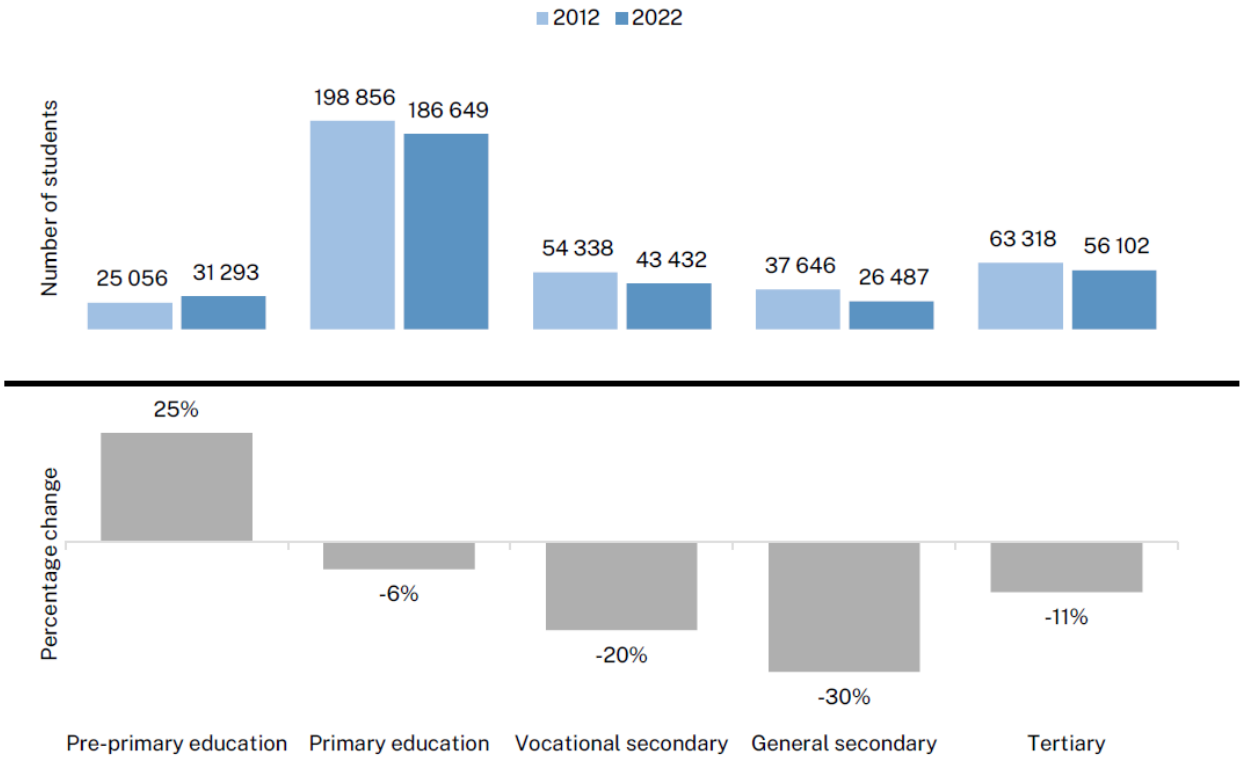
The concerning trend of having our students score bellow their peers in international measurements, initiates thinking in what can be done to bypass the challenges our system faces. The latest Programme for International Student Assessment (PISA 2022) results (OECD, 2023a; OECD, 2023b) show that only 26% of students in North Macedonia attained Level 2 or higher in reading compared to 74% of OECD average, and some 35% of students in North Macedonia attained Level 2 or higher in science in difference to OECD average of 76%, and almost no students scored at Level 5 or higher in reading (OECD average: 7%) similarly to science where almost no students were top performers, meaning that they were proficient at Level 5 or 6 (OECD average: 7%). The data about the achievement in mathematics is similar of having 34% of students attained at least Level 2 proficiency in mathematics, but this was again significantly less than on average across OECD countries (OECD average: 69%). In mathematics we have some 1% of students in North Macedonia being top performers, meaning that they attained Level 5 or 6 in the PISA mathematics test compared to OECD average of 9%.

Many different international and national assessments reveal the pitfalls in learning outcomes and raise concerns about the quality of the education system comparing it to other systems where students attain much higher results. This situation causes concerns and leveled up on the political agenda following many expert discussions and debates on what can assist in changing the overview of the educational sector. This paper addresses facts about having a situation in which our country has achieved near-universal access to education, but is facing systemic quality deficiencies, driven by resource inefficiency and inequity. Another set of factors such as challenge in planning and implementation of a curriculum based on the key competences for lifelong learning, inconsistence with assessment, poor to weak institutional support for ensuring quality due to lack of an independent voice and vital resources, need another type of analysis, but altogether tackle challenges head-on, with an in-depth and cross-sectoral understanding of what is needed to continue to build on the progress and to foster efficiency, accountability, and quality across the sector.

Facts are speaking when looking beyond numbers

Most levels of education have seen a decline in the number of students over the last 10 years, driven by a declining school age population in our country.

Figure 1. Number of students by level and year and percentage change, 2012–2022



Despite this, North Macedonia has seen a positive increase in enrolment ratios over the last 15 years, with levels almost reaching 100% for primary education in 2022. However, levels for pre-primary remain low (with a coverage of 27% in 2022) despite huge improvements, given its low starting level (11% in 2006).

If we analyze data for the class size, we have an interesting trend over the past decade showing that class sizes have dropped to reach 16.7 (2022) in primary and 19.6 (2023) in secondary education. These levels are below the norm set by the Law on Primary Education, which prescribes that each class should have at least 20 students. Only 17% of municipalities do meet this requirement, with the majority of municipalities (42%) having an average class size of between 11 and 15 students (UNICEF, 2022b). While the number of students in primary education has decreased by 24%, the number of teachers has increased by 43% over 2002–2022. Similar trends are observed in secondary education, with respective figures of -23% and -28%. Decreasing the student teacher ratio makes the running of schools very costly, while not warranting higher learning outcomes as PISA results in the Western Balkans suggest that neither smaller school sizes nor lower student-teacher ratios lead to improvements in learning outcomes.

So, there is a need for a more thorough look at analysis of data from many assessments to provide better evidence of the challenges that our educational system has. Domestic and international student assessments highlight weak foundational competencies. Learning deficiencies start early in the early years, with many children entering primary school not ready, and persist through to later grades. The education system fails to provide all students with the skills they need to successfully complete each stage and move confidently to the next. For example, in pre-primary education, the Measuring Early Learning Quality and Outcomes (MELQO) (Ministry of Labour and Social Policy & World Bank, 2023) instrument for pre-school children aged 3–6 years, implemented in 2022 in our country supported through the World Bank assistance, shows that, as children grow older, their progression in learning increases, with more and more children moving away from 'emerging readiness' and towards 'demonstrates readiness'. However, many children at the end of pre-primary are not fully school-ready. Four per cent of children aged 5–6 are still falling below 'emerging readiness' and 52% are 'developing readiness', which could highlight some quality issues.

In primary education, the Multiple-Indicator Country Survey (MICS) 2019 data(UNICEF, 2019a) shows that only 28.5% and 60.4% of children in second and third grades respectively had foundational reading skills. Even more worrying facts relate to children's numeracy skills, with only 11.1% and 38.4% of children in second and third grades respectively having foundational numeracy skills. This means that pupils tend to retain their weaknesses as they move to the next grades. Of major worry is that, by the end of primary education, not all children master full early literacy and numeracy skills, entailing that weakness tends to remain as they move to the next grades. By Grade 9, 79.7% of children demonstrated foundational reading skills, and 46.9% demonstrated foundational mathematics skills (IIEP-UNESCO, 2024).

At secondary level of education our students confirm the pattern of scoring lower than the OECD average in the PISA testing in core subjects: reading, science and mathematics:

Table 1. PISA scores by region, 2015, 2018 and 2022

Year	Science	Reading	Mathematics
OECD average (2018)	493	493	490
EU (2018)	484	482	489
WB (2018)	408	402	414
North Macedonia (2022)[2]	380	359	389
North Macedonia (2018)	413	393	394
North Macedonia (2015)	384	352	371
Differences			
2018-2015	29	41	23
2018-OECD average	-76	-94	-95

Source: National Examinations Centre, 2018, and OECD 2023b (for 2022).

When observing the results, it is noticeable that there are disparities in the level of skills development and achievements that exist among students due to several factors that are external

to the school system but have a major effect on the skills and learning outcomes of children. These include students' gender, the socioeconomic status of the families, the education level of parents, the place where they live, and the ethnic and linguistic background of the family.

These factors tend to shape children's outcomes, which may necessitate active policy interventions to narrow and eliminate existing gaps. Table 2 offers a recap of disparities across the various assessments available from preprimary until entering secondary school, using a parity index.

The paucity of disaggregated data in reports did not allow for a proper mapping of disparities by equity dimensions. In addition, few statistical analyses to assess whether the differences observed were significant could be performed, limiting the scope of the analysis. With these limits in mind, few observations can be made. Girls outperform boys in most assessments, yet differences are in many cases small or marginal. As often seen in the literature, girls systematically outperform boys in reading and literature. In mathematics, the pattern is less clear.

Table 2. Recap of disparities across the various assessments using a parity index

Year/grade	Source	Indicator	Parity index				
			Sex Girls/ boys	HH wealth rich/ Poor	Location urban/ Rural	Linguistic Macedonia n/others	Mother's education Higher/ primary and less
3-6 years old	MELQO 2022	Achieved, %			1.20	1.29	
3-4 years old	MICS 2021	ECD Index, %	1.18	1.35	0.97	1.43	1.26
6-14 years old	MICS 2019	Literacy, % Numeracy, %	1.20 0.76	1.69 2.03	1.08 1.13	2.41 2.71	1.74 1.82
Grade 3	EGRA 2015	Macedonian, % Albanian, %	1.06 1.03		 1.98		1.43 1.27
Grade 3	EGMA 2015	Maths, %	0.99		2.00	1.02	1.27
Grade 4	TIMSS 2019	Score Maths Score Science	1.00 1.03	1.10 1.13		1.11 1.13	
	PIRLS 2021	Score Reading	1.06	1.23			
15 years old (Grade 9)	PISA 2018	Score Reading Score Maths Score Science	1.14 1.02 1.05	1.22 1.15		 1.13	1.17* 1.19* 1.20*
Grade 12	Matura 2021 /2022	Score	0.97				

Source: Authors calculations based on data from various assessments. See Table A3.2 in the annex for the underlying scores.

Note: Gender Parity index of 0.85: for 100 boys who are developmentally on track, there are 85 girls developmentally on track. A parity index between 0.97 and 1.03 entails parity. * PISA reconstructed results are related to *parents'* education.

Socioeconomic status is one of the strongest predictors of performance, with socioeconomically advantaged students outperforming disadvantaged students. Household wealth is positively correlated with higher levels of achievement, starting at ECE level, and continuing across the various education cycles. The effect on learning can be sizeable: in the PISA 2022 testing,socio-economically advantaged students (the top 25% in terms of socio-economic status) outperformed disadvantaged students (the bottom 25%) by 76 score points in mathematics (OECD,

2023a, OECD 2023b). Higher socioeconomic status is associated, among other things, with parents having a higher level of education and better-paid professions that lead to the availability and use of more education resources (books, games, etc.) at home, systematically associated with higher performances1. The positive effect of education resources at home is at play for all education levels, starting at pre-primary and through to secondary, as highlighted in all assessments reviewed.

The level of education of parents, and of mothers, is among the most prominent predictors of skills and learning achievements, positively affecting learning outcomes of children throughout their school career. The higher the level of parents' education, the higher the child's level of achievement; the effect is linear.

The urban-rural location is an important factor affecting children's achievement, although it may be compounded by other factors such as the socioeconomic status and education level of parents, and the quality of the school supply. All assessments reviewed, show that children living in urban settings tend to outperform their peers living in rural settings. This pattern prevails from ECE to secondary. Linear regressions conducted on TIMSS 2019 confirmed the importance of location in shaping the learning outcomes of students for mathematics, but not for science.

The ethnic and linguist gap persists throughout the education system and in general tends to favor Macedonian speakers over other linguistic groups. Roma children are also consistently lagging behind their peers, with significant gaps. Data shows the level of disparities in children's learning and development outcomes among 3-6-year-olds across ethnic and linguistic groups. Differences exist between ethnic and linguistic groups and inconsistencies across domains, with Roma children lagging behind in all domains. Ethnic and linguist disparities continue until the end of secondary, with some evidence suggesting that they tend to increase as students move up the education ladder. For example, in the TIMSS 2019 study, students taking the test in the Macedonian language score 24 and 39 points more in mathematics and science respectively, compared to students taking the test in the Albanian language. PISA results display a similar conclusion.

Factors affecting learning and skills development

A well-performing school is a school that first and foremost ensures that its students acquire what is expected of them at each school level. Beyond the availability of pedagogical inputs and school organization methods, it is the school's ability to help students progress that counts. In order to better identify, from among the various factors, those that are at play in affecting students' achievement, for the purpose of this analysis, there is a recap of factors that positively and negatively affect learning outcomes among 15-year-old students, using the PISA 2018 data.

School factors, such as the quality of the school environment, teachers' qualifications, and the organization of teaching and learning at school are positively affecting learning outcomes but are not that prominent. A quality educational environment (i.e. an advantaged school (assessed by

[1] This pattern remains valid across countries and could partially explain the lower scores observed in North Macedonia, compared to OECD countries

the school's socioeconomic and cultural status, adequate level of infrastructure and equipment, adequate staffing in both number and quality)) is generally associated with more diverse and quality opportunities being offered to students to practice skills and develop higher capacities in learning, as is the school's teaching and learning organization (i.e. class size, student-teacher ratio). These all combine to offer students quality and diverse learning experiences that support educational success.

Table 3. Factors affecting students PISA score, by subject, 2018

Positive effect	Negative effect
Reading	
Student is female Household socioeconomic status Level of education of parents* Language at home is Macedonian Preschool (start age at 3 or 4) General stream (over VET stream) School socio-economic and cultural status Class size (small effect) Teacher fully certified STR2 (small effect)	Share of teachers with a master Lack of teaching staff Lack of educational material* Lack of physical infrastructure* School size (small effect) STR (small effect) Starting preschool at 6 years old
Math	
Household socioeconomic status Level of education of parents* Language at home is Macedonian General stream (over VET stream) Teacher fully certified Class size (small effect) STR2 (small effect)	Student is female Share of teachers with a master* School size (small effect) STR (small effect) Lack of physical infrastructure* Starting preschool at 6 years old
Science	
Student is female* Household socioeconomic status Language at home is Macedonian General stream (over VET stream) Teacher fully certified Class size (small effect) STR2 (small effect)	Share of teachers with a master* School size (small effect) STR (small effect) Lack of physical infrastructure* Starting preschool at 6 years old

Source: PISA 2018, Linear regressions. Authors' computation.

Note: * statistically significant at 10%, otherwise is at either 5% or 1%.

Discussion and conclusion

Our country has seen steady increase in levels of enrollment for all levels of education, although the biggest challenge continues to be enrollment in preschool age. At this age, children's learning experiences across key domains are inconsistent and of insufficient quality to promote the development of key readiness for school skills and abilities.Gaps that begin in the early years can be hard to close, especially for children who are vulnerable and/or from poorer communities. Disparities are identified at an early age, so it is very important to plan for continued efforts to broaden access to quality preschool education to ensure that children arrive ready for school. This could help consolidate progress by addressing disparities when they first emerge. Data that was analyzed pointed out that the readiness of children for primary school and their school performance later on can be improved through attendance on ECE programs. In addition, data confirmed that students who attend schools with many resources have higher achievements than those who attend schools with fewer resources.It is of the utmost importance to address factors (gender, urban-rural settlement, language of instruction, etc.) in curricula, teaching and assessment, schooling conditions, etc., to overcome existing gaps in students' achievement and prevent these becoming more pronounced as students progress through the system. Providing support for students from families with a lower socioeconomic background in theform of scholarships, free meals, school supplies, etc. could be of assistance in the short term, but in the long run the Government should establish an effective model for supporting low-achieving students to avoid children and students being left behind. This model must provide teachers with specific training to support students with learning loss through tutoring and one-to-one activities and introduce specific measures for learning recovery. This should start with identifying students with the highest learning loss and helping understand what students are missing, so that teachers can teach at the right level and cater to the specific learning needs of students (especially for key competencies such as literacy and mathematics).

In increasing quality, the emphasis should be put on equipping students with high-level cognitive and socio-emotional skills, while ensuring that the learning process is enjoyable and engaging for students so that they become lifelong learners. As part of this effort, the curriculum must be delivered in a way to help students develop into critical and reflective thinkers, as well as active and relevant participants in social and civil life.

The home learning environment and parental support in children's learning are important dimensions to consider, as favorable conditions can positively stimulate children's learning and foster higher learning outcomes, while poor conditions can be detrimental, starting already during the early years. Beyond learning activities at home, parental involvement in school activities can play a significant role in enhancing the learning outcomes of children, regardless of social and technical background. There is need to enable more efficient parent involvement in education through activities they are interested in, and which fit their schedule, which they are comfortable with and feel benefit their child and also provide support to parents to adequately support their

children's learning experience at home through various services: home visit services, helplines, community services and ensuring an equity approach in making support available to all parents and families with children, especially young parents and families in vulnerable situations.

Another important step is to deepen the analysis of factors influencing learning and development needs and strengthen coordination across all levels of education. Improving the system and capacities for functional and effective data collection and analysis in a harmonized manner (at school, local/municipal and national levels can contribute to evidence-based policy-making that is prerequisite for meaningful change and improvement.

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