

The Impact of Population Trends on the Needs of the EDUCATION SYSTEM

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KEY HIGHLIGHTS

- After years of rapid student expansion, the student age population will decline from 32.4 million in 2025 to 28.9 million in 2035. Despite that, the public education system will need to expand its capacity to deliver better service. The MoETE Statistical Yearbook indicates students overcrowding in all educational levels, as well as a high student to teacher ratio.
- The kindergarten and primary student population will decline between 2025 and 2035, whereas the preparatory and secondary student population will increase till 2030 and then start to decline between 2030 and 2035.
- To achieve the gross enrolment rates and pupil-teacher ratio¹ as per Education Sector Plan (ESP), the public system will need to have 398,287 additional teachers in total by year 2027.
- A similar pattern is observed for the number of additional classrooms needed to meet the ministry's target² for each education level.
- In this context of population change, efficient planning is crucial to improve quality of the learning and teaching throughout the education system. There are various factors that contribute to the quality of education, including curricula, teacher's skills, assessment, infrastructure, and other resources, all of which need to be considered alongside population change.

UNICEF EGYPT DATA SNAPSHOT SERIES

The UNICEF Egypt Data Snapshot Series aims at encouraging evidence-based discussion on critical child-related issues. This data brief is produced by UNICEF Egypt using recent evidence and integrating data from multiple sources.

¹The targeted gross enrolment rates set to be achieved by 2027 are 42.2 per cent for kindergarten, 102 per cent for primary education and preparatory education, 45.7 per cent for secondary education. Regarding the pupil-teacher ratio, the ministry is targeting 19 students per teacher for kindergarten, 26 for primary education, 21 for preparatory and the same for secondary.

²The MoETE class size targets for 2027 are 25 students per class for kindergarten, 37.8 students per primary class, 38 students per preparatory class, and 30 students per secondary class.

WHAT IS THIS BRIEF ABOUT?

Over the next decade, Egypt is expected to see significant population growth despite the declining total fertility rate (TFR) (reaching 2.85 in 2021 compared to a level of 3.5 in 2014). In 2022, the Central Agency for Public Mobilization and Statistics (CAPMAS) estimated that Egypt's population would reach 105.4 million, an increase of 1.9 million over the previous year, while it is expected to increase by another 1.9 million by the end of 2023 to

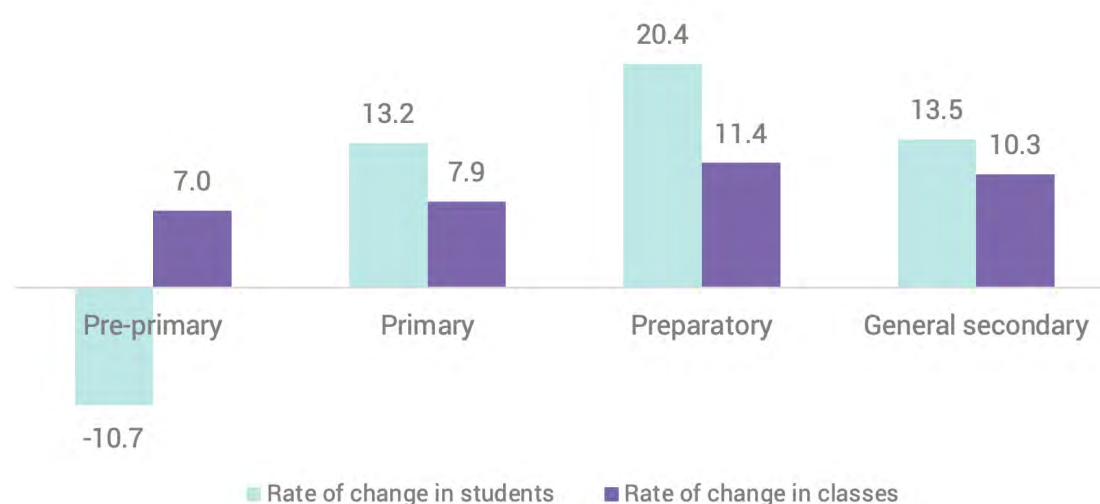
reach 107.3 million. Population growth trends in the past five years have reflected in an increase in the number of students the education system in Egypt has to serve. Data from the MoETE Statistical Yearbooks shows an increase in the gross enrolment rates for primary, preparatory and general secondary education over the past five years, except for pre-primary education where the numbers have declined.

Change in number of students over the past five years in the public education system						
	2018/19	2019/20	2020/21	2021/22	2022/23	Rate of change
Pre-primary	1,038,549	1,099,305	935,448	869,704	927,029	-10.7%
Primary	11,002,210	11,556,120	12,119,867	12,477,650	12,452,829	13.2%
Preparatory	4,636,903	4,835,418	5,136,184	5,423,519	5,582,843	20.4%
General secondary	1,496,539	1,527,699	1,578,913	1,633,984	1,698,598	13.5%

The increase in the number of schools and classes has not been at a high enough rate to meet the increased enrolment except for kindergarten education since the number of students enrolled has dropped considerably between 2018/2019 and 2022/2023. During the five-year period between 2018/2019 and 2022/2023, the number of primary students increased by 13 per cent, while the number of primary classes has increased by 8 per cent. In numbers,

1.45 million new primary students enrolled into the system while the number of additional classes established was 16,827 meaning that each new class had to accommodate about 86 new students. The same imbalance is observed for the preparatory level and at a lesser extent in general secondary. Unlike the number of schools and classes, the number of teachers has declined during the past five years for all levels of education except pre-primary education.

Figure 1: Rate of change in students and classes between the academic years 2018/19 & 2022/23



Analysis of future population trends for the student-age population shows that the pattern of the past five years depicted above, will change by 2025 reflecting the decline in fertility rates. This presents an opportunity to optimize the use of the stretched resources of the public education system. However, meeting the Key Performance Indicators (KPIs) set by the Ministry of Education and Technical Education (MoETE) could be challenging.

This data snapshot projects the needed classes and teachers in the education system up to 2035, utilizing the CAPMAS estimates for population projections from 2017 to 2052 (CAPMAS, 2019), available school data from Ministry of Education and Technical Education (MoETE) 2022/2033 Statistical Yearbook, and Education Sector Plan pupil-teacher ratio (PTR) and classroom density targets. The class size and PTR targets are among the Key Performance Indicators set by the ministry aiming

to ensure that all Egyptian citizens have access to quality education. Although there are many other indicators to measure education quality, a low PTR and a small class size allow the teacher to pay more attention to individual students and facilitate an engaging learning environment, which could potentially improve student performance.

The quality of primary education is a critical challenge according to international assessments. Egypt ranked 42 out of 43 countries on the 2021 PIRLS³. The majority of grade 4 students have not achieved a basic level of reading skills, which limits their ability to learn other subjects. Overall, female students, on average, perform somewhat better than male ones. A high proportion of grade 4 students (55 per cent) did not even reach the low benchmark for reading on PIRLS and less than half (45 per cent) reached the low benchmark, whilst only 1 per cent reached the advanced benchmark.

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WHAT ARE THE STUDENT AGE POPULATION GROWTH TRENDS IN EGYPT?

In 2017, CAPMAS announced the results of the General Census of Population, Housing and Establishments, indicating that the population in Egypt had reached 95.5 million people, a 22.7 million surge compared to the 2006 census. Utilizing the cohort survival projection method, CAPMAS has also projected population growth from 2017 till 2052. In its projections, CAPMAS provided three scenarios using various growth rates: high, moderate, and low. This data snapshot relies on the low population growth rate scenario as it is close to the current population size and declining TFR. Overall, Egypt's population will significantly grow over the next decade reaching 111 million in 2025, 120 million in 2030, and 128 million in 2035.

Using the CAPMAS projections, the analysis extracted the projected numbers of the school-aged population by educational level. The figures presented in this section lay out the broad base number of children the education system will serve if the system is to provide services for the whole school-aged population. Looking at the projected kindergarten-aged population (children aged 4-5 years), data indicates a steady decline in the number of children. In 2025, it is projected that there will be 4.4 million children in the age cohort of 4-5 years and by year 2035 these figures are projected to decline to 3.8 million children in the same age group. In general, the kindergarten-aged population will decline by about 14 per cent during the period between 2025 and 2035.

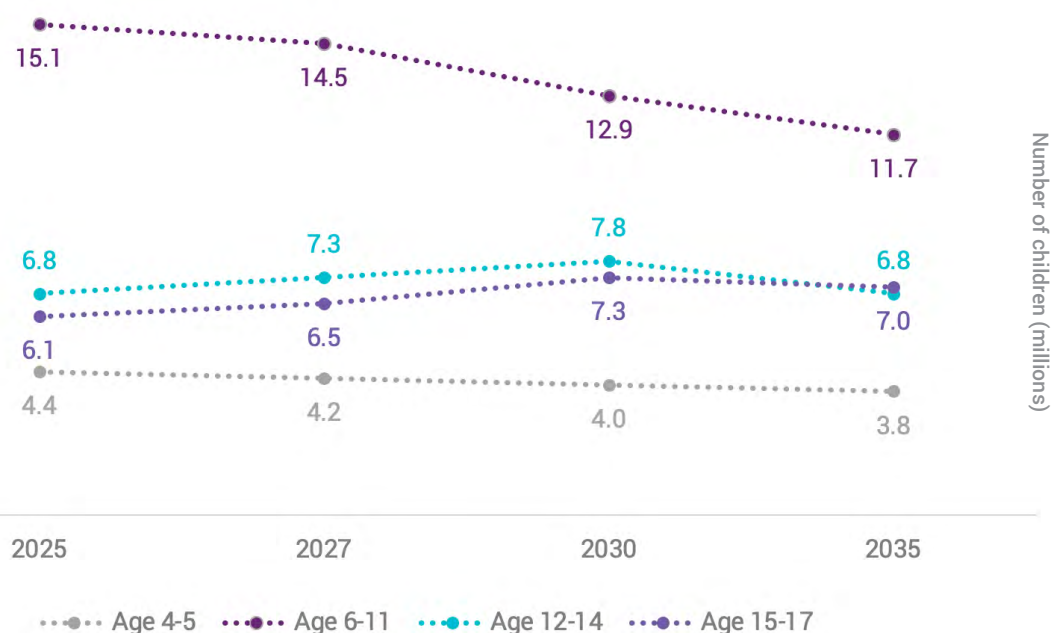
³ Progress in International Reading Literacy Study (PIRLS) is an international assessment that measures reading achievement at the fourth-grade level.

Concerning the primary school-aged population, children aged 6-11 years, data also indicates a projected decline in their numbers. In 2025, Egypt is expected to have 15.1 million children aged 6-11 years; this figure decreases to 14.5 million in 2027 and then further declines to 12.9 in 2030 and 11.7 in 2035. This potentially creates an opportunity to reach the target of 100 per cent Net Enrolment Rate (NER) for primary education level.

The number of children aged 12-14, who are the school-aged population for the preparatory school level, is expected to increase during the period in question with a relative peak

in 2030. The expected 6.8 million children aged 12-14 in 2025 will increase to reach 7.3 million in 2027 and furthermore to reach 7.8 in 2030, before dropping to 6.8 million by year 2035 (which is the same number observed in 2025). Looking at the last age cohort of 15-17 years, who are in the secondary education age range, data indicates an absolute increase of about 15 per cent from 6.1 million in 2025 to 7.0 million in 2035. In fact, Egypt will witness the highest number of children aged 15-17 years (7.3 million) in year 2030 before starting to decline reaching 7 million children by 2035.

Figure 2: Projected population size by age cohort, 2023-2035 (millions)








HOW SHOULD THE EDUCATION SYSTEM PREPARE?

The MoETE in its Education Sector Plan strategy (ESP) has set several targets against Key Performance Indicators (KPIs) for each of the main educational levels including pre-primary education, primary, preparatory and general secondary education. The ESP established targets for the year 2027 but no targets are set for the following years; thus, this analysis will rely on the 2027 targets as the goal to be achieved during the period in question. The analysis will be based on the assumption that target gross enrolment rates (GER)⁴ will be reached. The size of the student population that the public system has to serve

was estimated factoring in the proportion of students who attended public schools, as reported in the Statistical Yearbook 2022/23. It is also worth noting that the analysis is carried out for the general secondary education excluding technical and vocational education.

Moreover, a yearly natural attrition rate of 2.14 per cent was applied to estimate the number of teachers who will remain in the system⁵. Finally, the needed number of classes and teachers are calculated assuming that the targeted PTR and class size will be met.

MOETE EDUCATION KPIs FOR 2027

	Kindergarten	Primary	Preparatory	General Secondary
				
Gross Enrolment Rates	45.2%	102%	102%	45.7%
Net Enrolment Rates	N/A	100%	98%	N/A
Pupil-Teacher Ratio	19	26	21	21
Class Size	25	37.8	38	30

Source: MOETE Education Sector Plan

Pre-Primary/Kindergarten Education

According to the MoETE Statistical Yearbook, the GER for pre-primary education was 23.1 per cent for the academic school year of 2022/2023. The Ministry aims to improve the GER to reach 45.2 per cent by 2027. It is interesting to note that the ministry’s Statistical Yearbook 2022/2023 displays remarkable discrepancies in the GER across governorates.

For instance, the GER is already high and meeting or exceeding the target in Port Said (62.1 per cent), Red Sea (51.9 per cent), South Sinai (62.0 per cent) and Cairo (47.6 per cent). In contrast, the GER is lowest in Beheira, Dakahlia, Sharqia, Fayoum, and Minya (16.3, 15.8, 16.8, 13.2 and 13.3 per cent, respectively).

⁴ The Gross Enrolment Rate is calculated as the total number of students enrolled in a specific level of education divided by the official school age population. Thus, the GER can exceed a 100 per cent due to the inclusion of over-aged or under-aged students because of early or late entrants and grade repetition, as well as the inclusion of non-Egyptians who are enrolling in public schools.

⁵ Attrition rate was calculated from data provided in the Egypt Pre-University Education Sector Analysis 2021 report. The average decline in the number of teachers between 2017/18 and 2021/21 was calculated and the same rate was assumed to apply to the baseline number of teachers without considering new hires.



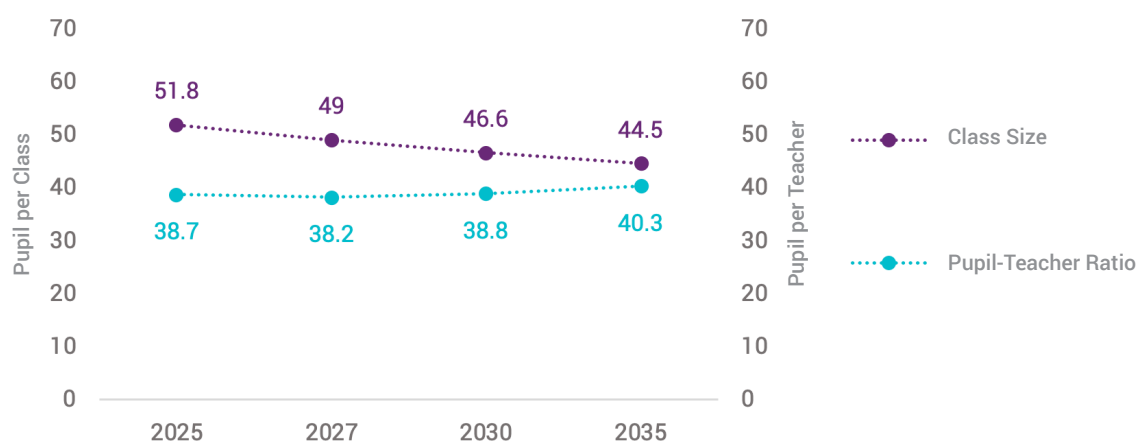
The ministry also seeks to reduce the PTR ratio to 19:1 and the classroom size to 25 students per class by the year 2027. The expected decline in the number of kindergarten student population is offset by an expected decline in the number of teachers. Accordingly, the PTR remains around 38 pupils per teacher during the period between 2025 and 2030 and then increases to 40.3 by 2035. The PTR remains significantly higher than the target set by the ministry. By 2035, the projected PTR for kindergartens will be 40.3 meaning that on average a teacher is allocated 21 more students than the threshold set by the ministry.

According to the MoETE Statistical Yearbook 2022/2023 there are 40,190 public kindergarten teachers. Assuming that the 45.2 per cent GER is achieved, the number of teachers that will be needed has been calculated to meet

the target PTR of 19 pupils per teacher. By 2025, the ministry is expected to need an additional 39,866 kindergarten teachers. The additional number of teachers needed will steadily decline as the kindergarten student population decreases. By 2035, even with the decline, the public schooling system in Egypt will need to recruit an additional 35,579 kindergarten teachers, to meet its ESP target and 117,109 teachers to achieve the 100 per cent enrollment..

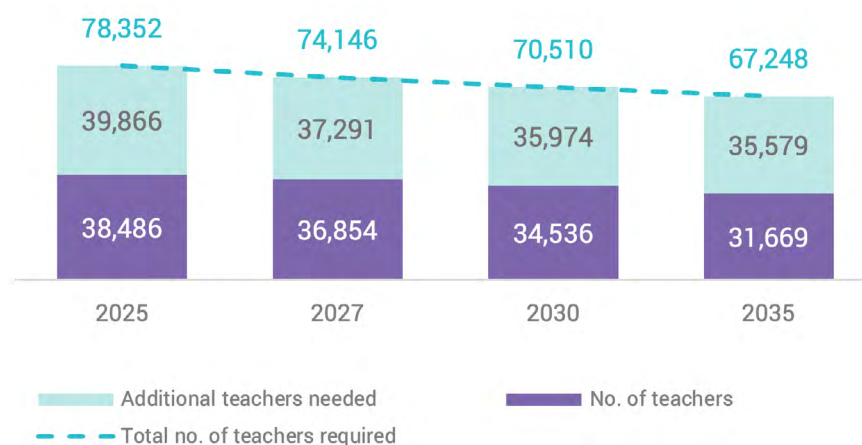
The reported classroom density in public schools for pre-primary education was 32.3 for the academic year 2022/2023, which is higher than the target set by the ministry at 25 students per class. Again, assuming that the government is to achieve the 45.2 per cent GER and maintain the same number of classes reported in 2022/2023, the pre-primary classes are expected to get more crowded.

Figure 3: Projected kindergarten class size and pupil-teacher ratio in public schools 2025-2035



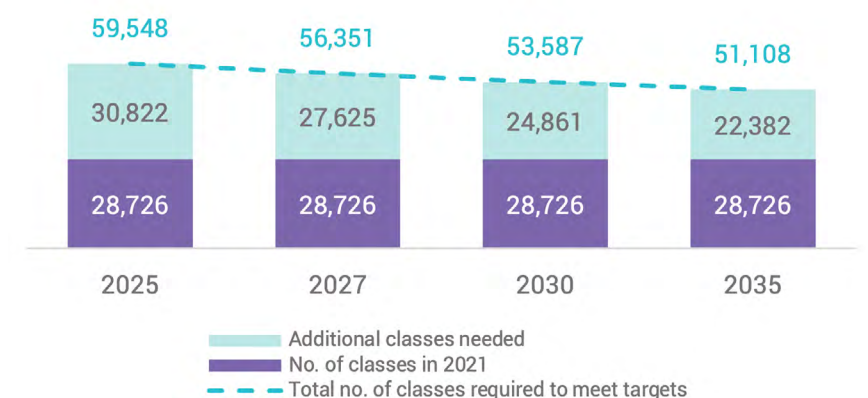
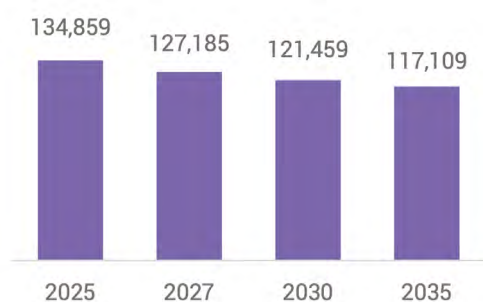
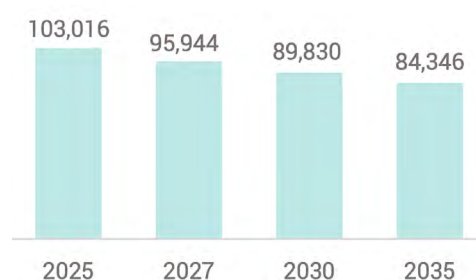
On average, kindergarten classrooms will have 51.8 students in 2025, 49 students per classroom in 2027, 46.6 students in 2030 and 44.5 students by 2035. Despite the decrease in the number of students, the classroom density remains extremely high and continues to pose a challenge.

Analyzing the needs based on the targeted classroom size of 25 students, the government needs to invest in building 30,822 new classrooms by 2025; this figure progressively declines to reach 22,382 by 2035.

Figure 4: Public kindergarten teachers needed to meet the MoETE targets

SDG 4.2 calls for ensuring that all girls and boys, by 2030, have access to quality early childhood development, care and pre-primary education so that they are ready for primary education. Accordingly, another analysis exercise was applied to calculate the needs of the public system if hypothetically the pre-primary enrolment rate of 100 per cent is achieved. With that assumption, the need for

additional teachers and classes increases dramatically. By 2030, a total of 89,830 additional classes will be required to absorb all pupils enrolled while achieving the target class size. Concerning teachers, a total of 121,459 additional kindergarten teachers will be needed by 2030 to accommodate all pupils and achieve the target PTR.

Figure 5: Public kindergarten classes needed to meet the MoETE targets**Figure 6: Additional numbers of public kindergarten teachers needed to meet PTR of 19 if enrollment rate is 100%****Figure 7: Additional number of public kindergarten classes needed to meet class size of 25 if enrolment rate is 100%**



Primary Education

The MoETE aspires to achieve 102 per cent GER for primary education by 2027. Additionally, the ministry also aims to reduce the PTR ratio to 26:1 and the classroom size to 37.8 students per class. Aggregated at the national level, if the public education system is to achieve the targeted 102 per cent GER then the PTR is expected to reach 38.6 by year 2035 if the natural attrition rate is applied to the number of teachers reported in the Statistical Yearbook of 2022/2023 without taking into consideration new hires. In fact, the PTR improves (i.e., declines), due to the decline in the number of children who are of primary education age (6-11 years old), from 41.1 in 2027 to 38.8 in 2030 and further drops to 38.6 in 2035. However, this ratio is still

12.6 pupils per teacher higher than the ministry's target PTR of 26:1, as set in the ESP.

The MoETE Statistical Yearbook 2022/2023 indicated that there are 357,714 public primary teachers registered in the MoETE. If the ministry is to achieve the 102 per cent GER and 26:1 PTR, that would require recruiting and training of an additional 197,678 teachers by 2025 after adjusting for teachers' natural attrition. The number of teachers required to meet those targets will gradually decline as the primary student population shrinks. Despite this, the public schooling system in Egypt will still need 136,221 more primary teachers by year 2035.

Figure 8: Projected primary-level class size and pupil-teacher ratio in public schools 2025-2035

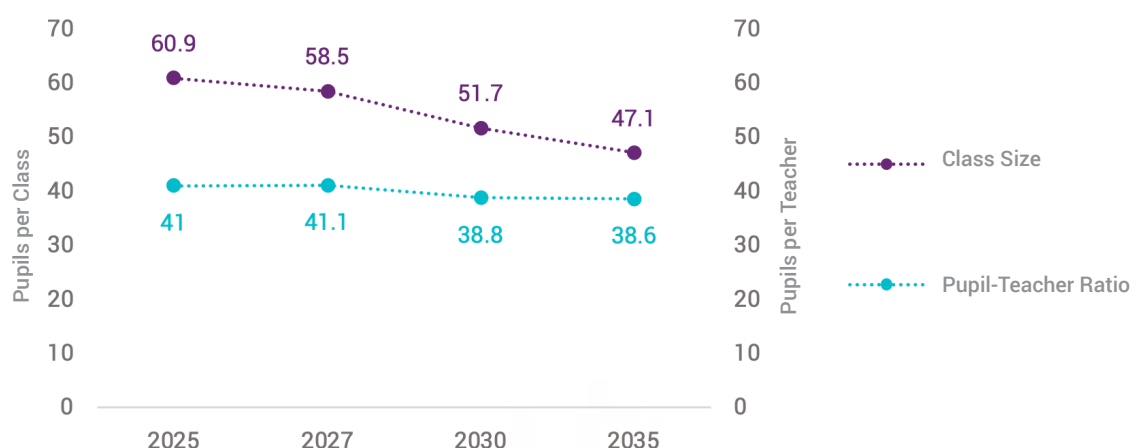
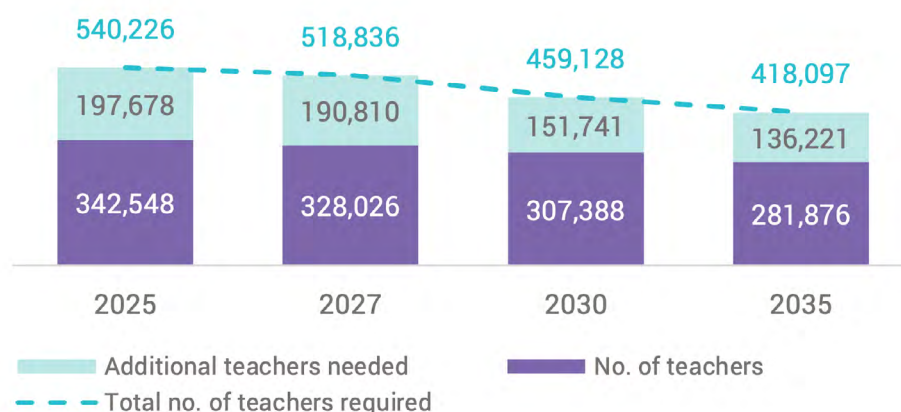
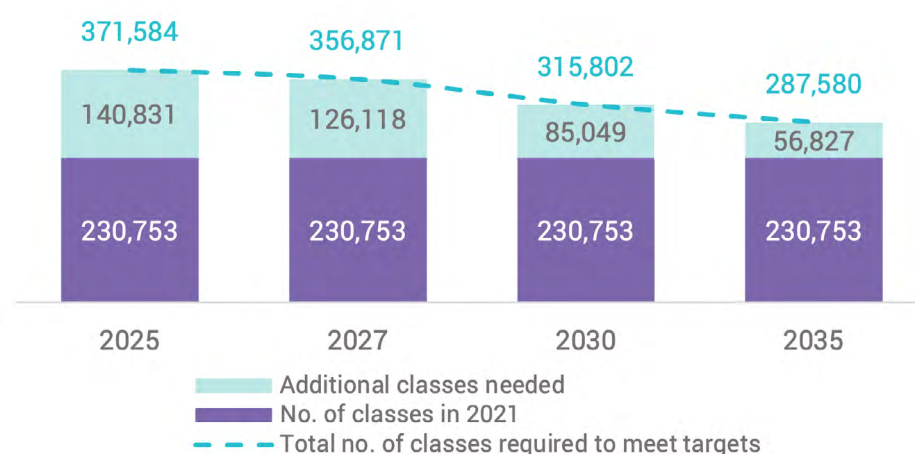


Figure 9: Public Primary teachers needed to meet the MoETE targets

Looking at the primary classroom density in public schools, it is clear that classes are crowded. If the government is to achieve the 102 per cent GER and doesn't invest in establishing new primary classes, then on average the primary classrooms will have 60.9, 58.5, 51.7 and 47.1 per classroom in 2025, 2027, 2030 and 2035 respectively. Despite the decrease in the number of students, the class density remains high and continues to pose a challenge.

In order to achieve the targeted GER of 102 per cent and primary classroom size of 37.8, the government needs to invest in building new schools and/or expanding more classrooms within existing schools. Overall, by 2025 the ministry needs 140,831 more classes than what was reported in 2022/2023 (230,753 classes). The number of additional classes needed will continue to decline to reach 56,827 classes by 2035.

Despite the decrease in the number of students, the class density in primary remains high and continues to pose a challenge.

Figure 10: Public primary classes needed to meet the MoETE targets

Preparatory Education

Following the same methodology discussed earlier for pre-primary and primary education, the estimated PTR was calculated for the preparatory level for the period of 2025-2035. In 2025, the PTR is expected to be 31.3 for the preparatory level. Unlike in the pre-primary and primary stages, the PTR is then expected to increase to reach its highest level of 40.3 students per teacher in 2030 before it drops to 36.5 in 2035. Accordingly, and in order to achieve the target PTR of 21 students per teacher, the ministry still needs to recruit additional qualified teachers. It is estimated that the ministry will be short of 100,388 teachers by 2025. Similar to the pattern observed in the PTR, the needed number of teachers will gradually increase to reach its peak by 2030 at 169,484 additional teachers needed. By 2035, the number of additional teachers needed will drop by about 26 per cent to reach 124,581 teachers, which is lower than the number of teachers needed in 2027. Accordingly, efficient planning is needed by the ministry to manage staffing needs.

The classroom density is also a challenge at the preparatory level. It is projected to have 58.3 students per class in 2025 assuming that the government will maintain the same number of classes reported in 2022/2023. On average the preparatory classroom will have 63 students per class in 2027 which will increase to 67.5 in 2030 before dropping to 56 students per class in 2035. Subsequently, there will be a need to establish more preparatory level classes. The number of additional required classes is considerably lower than the estimated numbers of primary and kindergarten classes needed. Overall, the ministry will need to have 58,825 more preparatory classes by 2025. The number of additional classes needed will increase and then eventually decline by 2035 to reach 52,097 classes which is lower than the numbers needed by 2025.

Figure 11: Projected preparatory level class size and pupil-teacher ratio in public schools 2025-2035

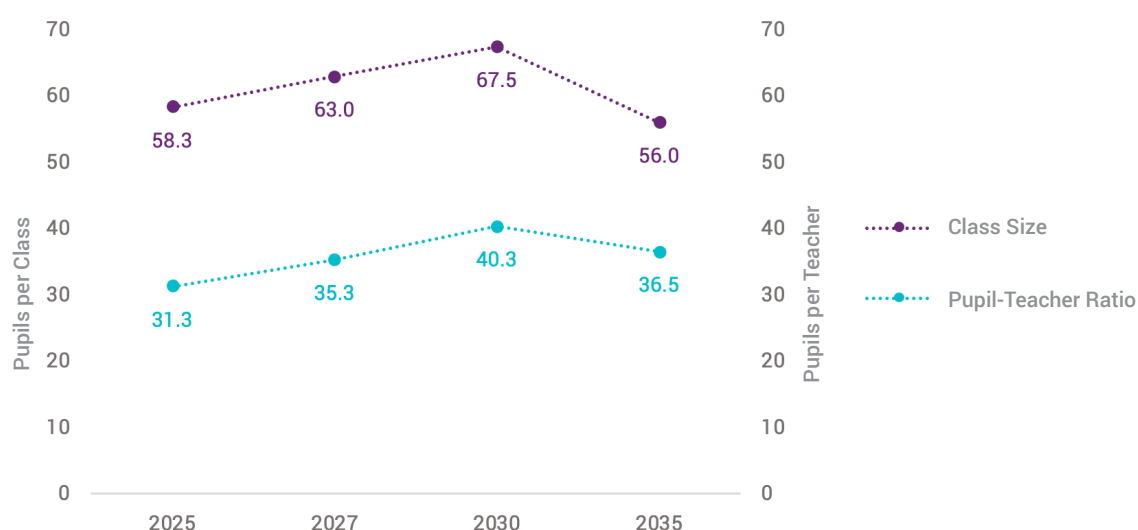


Figure 12: Public preparatory teachers needed to meet the MoETE targets

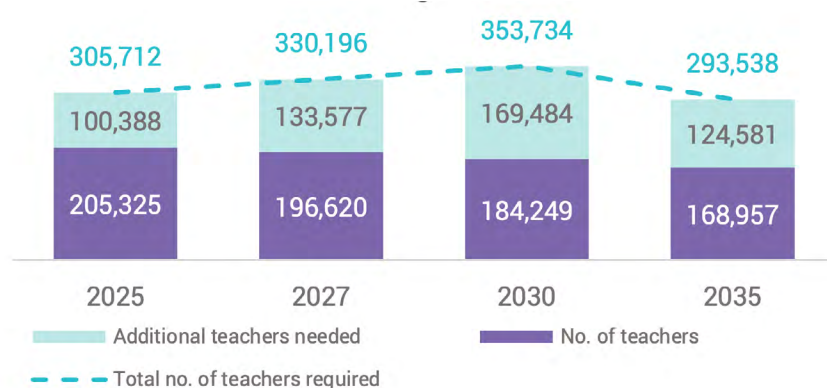
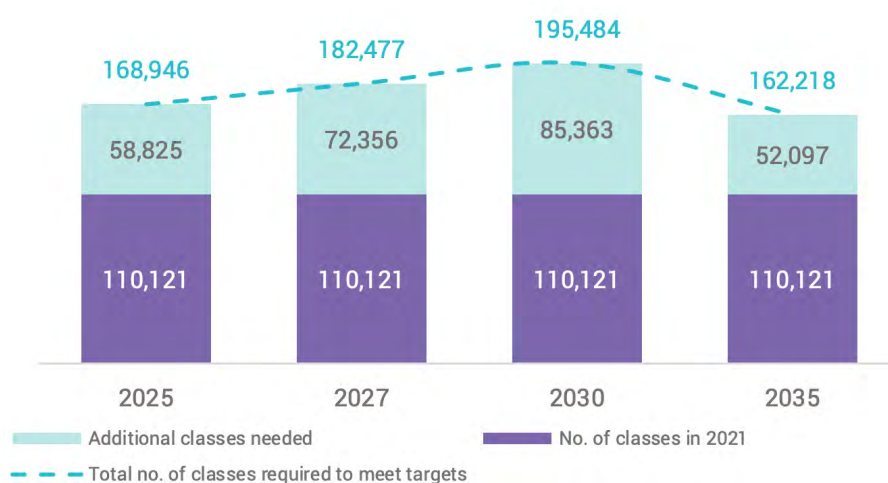




Figure 13: Public preparatory classes needed to meet the MoETE targets



General Secondary Education

Due to the expected increase in estimated number of general secondary students to enrol within the public system, the PTR will continue to increase till 2035 to reach 38.3. If the ministry is to achieve the PTR of 21 pupils per teacher and GER of 45.7 in general secondary, then more teachers are required. The number of additional teachers needed is much lower than the estimated numbers for earlier educational levels. In total, the ministry will need to have 36,609 more secondary teachers by 2027 to meet the targets set. This number will increase to 54,972 teachers by 2030 and slightly decline to 54,595 teachers by 2035.

As in the case with other educational levels, classroom density is a challenge within general secondary classes. It is

projected to have 57.4 students per class in 2025, assuming that the government will maintain the same number of classes reported in 2022/2023. On average secondary classes will have 61.7 students per class in 2027 which will increase to 69 in 2030 before declining to 65.5 students per class in 2035. Subsequently, there will be a need to establish more secondary level classes. The number of additional required classes is substantially lower than the estimated number of primary and preparatory classes needed. Overall, the ministry will need to establish 40,925 more classes by 2027 to achieve the target class size of 30 students per class. The number of additional classes needed will increase and then eventually decline by 2035 at which point 45,907 more classes will be needed.

Figure 14: Projected secondary level class size and pupil-teacher ratio in public schools 2025-2035

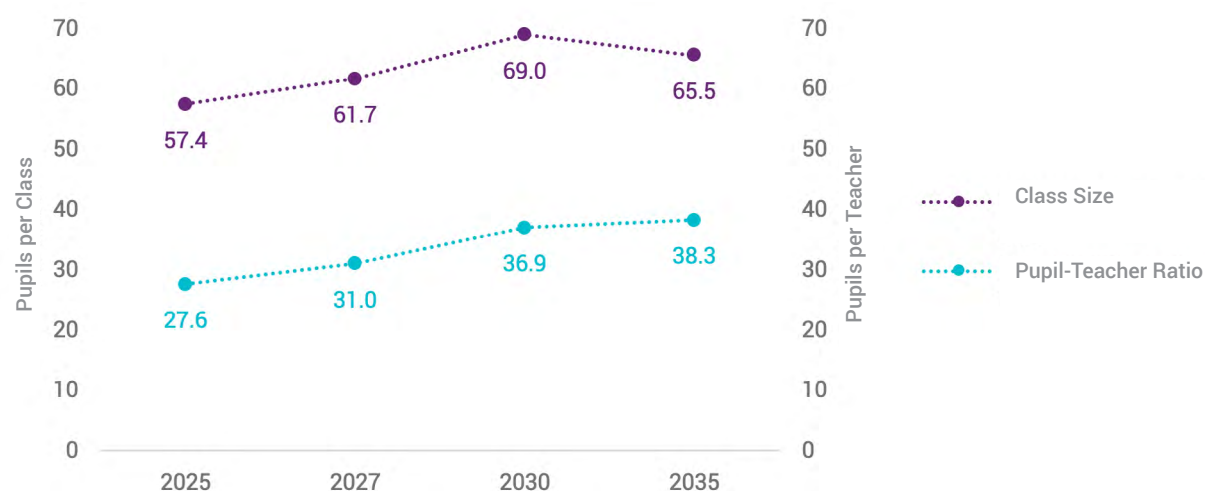


Figure 15: Public secondary teachers needed to meet the MoETE targets

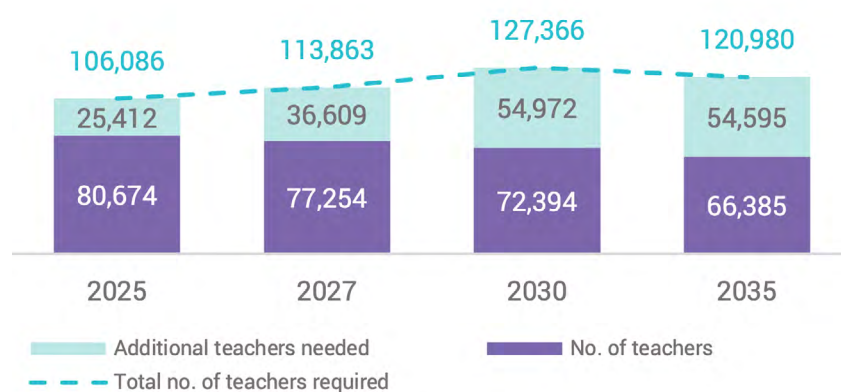
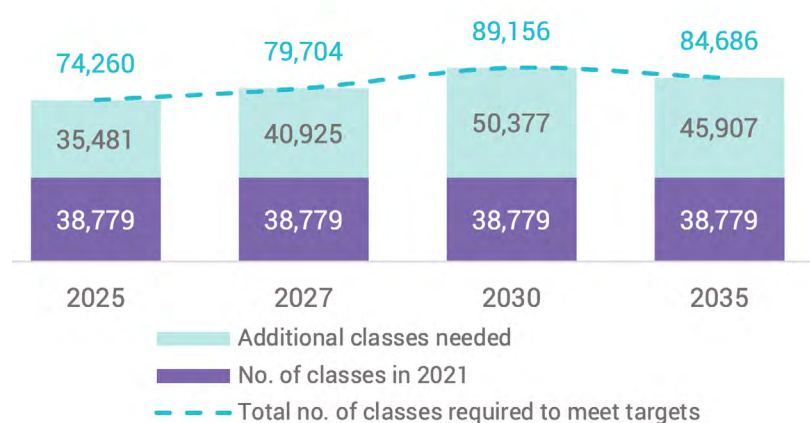


Figure 16: Public secondary classes needed to meet the MoETE targets





WHAT IS THE GOVERNMENT DOING TO IMPROVE THE EDUCATION SYSTEM?

Sustainable Development Goal (SDG) 4 aims to “ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.” There are various factors that contribute to the quality of education, including curricula, teachers’ skills and training, infrastructure and other resources. The MoETE has developed and implemented a number of reform strategies and programmes to improve the educational system and accordingly enhance human capital and provide long-term benefits for future generations. Nonetheless, the quality of education remains compromised, requiring comprehensive and collective efforts to provide equitable and accessible high-quality education services.

In 2018, the MoETE launched a number of reform programmes aligning with the country’s sustainable development strategy “Egypt Vision 2030” and

its commitment to achieve the SDGs by 2030. The government initiated the reform project “**Education 2.0**” also known as the “New Education System” to improve the quality of education and learning experience in public schools. Education 2.0 adopted new learning approaches, assessment methods, new skills-based curriculum, and digital learning technologies. The reforms start with the early grades, consecutively moving up one year at a time. The MoETE has also developed a five-year Pre-University Education Sector Plan (ESP) providing clear strategies to tackle challenges within the education system and to build a robust and resilient system, with support from UNICEF and the Global Partnership for Education (GPE). In line with this reform, the MoETE adopted a new system for technical and vocational education (**Technical Education 2.0**) that meets international standards.

WHAT IS UNICEF DOING TO SUPPORT THE GOVERNMENT?

Education is at the heart of UNICEF's vision and goals. UNICEF believes that education changes life and that all children should have access to equitable opportunities to quality learning and education services to reach their full potential. UNICEF works closely with MOETE as well as collaborates with many partners, including UNESCO, UNHCR, ILO, UNFPA, the World Bank and more, to improve the educational system so all children and young people in Egypt gain critical foundational skills and 21st century skills for their and country's future.

01

Life Skills in Curricula

UNICEF supported the new education system "Education 2.0" by integrating life skills into the new curriculum.

02

Education Sector Analysis and Planning

UNICEF supported MOETE to become a member of Global Partnership Education (GPE). GPE is the largest global fund solely dedicated to transforming education in lower-income countries, offering a unique multi-stakeholder partnership. In this process, the MOETE supported by UNICEF, developed the Education Sector Analysis and Education Sector Plan.

03

Foundational Skills

After COVID-19, UNICEF developed a Learning Recovery Programme to ensure that all Grade 2-5 students acquire foundational literacy and numeracy, which is now adopted by MOETE.

04

Continuous Professional Development for Teachers

UNICEF is working with MOETE and partners to enhance teachers' skills.

05

Digital Learning

UNICEF is helping teachers harness digital technology to improve learning, such as for example the Learning Passport, UNICEF's digital learning platform.

LIMITATIONS OF ANALYSIS AND PROJECTIONS

Analysis presented in this brief relies primarily on two data sources: MoETE Statistical Yearbook and CAPMAS population projections. The analysis for secondary education is limited to the general secondary excluding technical education. Also, the analysis does not include data from Al-Azhar education system. Shortcomings have been identified in both sources as well as other limitations in the statistical approach. Thus, the projected number of needed teachers and classes are indicative estimates and should be revised through the coming years when CAPMAS produces their new population projections and if the MoETE updates their Statistical Yearbook indicators calculations. In the following is a brief description of the limitations of the projected analysis.

- By definition, the net enrolment rate is the number of students in the official age group divided by the total population in the same official age group and thus the NER should not exceed 100 per cent. The reported net enrolment rate for primary education in the ministry's Statistical Yearbook 2022/2023 is 102.2 indicating inconsistencies between enrolment and population data which would require reviewing the methodology used. This implies that also the net enrolment rates for all education levels need to be reviewed. Furthermore, this also indicates that the actual gross enrolment rates might differ from the published figures.
- CAPMAS projections are based on the 2017 census. Since then, the fertility, mortality and migration rates have changed, and thus revised projections are needed to provide more accurate numbers.
- The numbers of calculated populations of official age groups based on CAPMAS low scenario projections are higher than the reported numbers of official age groups within the Statistical Yearbook 2022/2023 for primary, preparatory and secondary educational levels but lower for kindergarten. Again, indicating inconsistency in the numbers of student age population.
- The analysis relied on KPIs listed in the Education Sector Plan (ESP). KPIs are set for the year 2027, however, the analysis assumes these same targets for years, 2025, 2027, 2030 and 2035. Additionally, the ESP clearly states that the targets for classroom size are set for public schools, whereas in the case of PTR there is no reference whether the targets are set for public schools only or across all schools. The analysis assumes both are targets for public schools.
- Teachers' attrition rate was calculated from data provided in the Egypt Pre-University Education Sector Analysis 2021 report covering the period between 2015/16 and 2021. The rate was calculated for the total and assumed to apply for all education levels, however; there might be discrepancies based on educational level.
- The analysis looks at the levels and numbers at the national level, yet variations across regions, governorates and urban-rural areas need to be adjusted for.





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