



# Policy Brief

## *Participation of Arab countries in Early Childhood Education and Reading Literacy Skills of Fourth-Grade (or Sixth Grade) Students – Results from PIRLS 2011*

### Contents

Summary.....	1
Policy Implications.....	1
Introduction.....	2
Data and measures.....	3
Participation in early childhood education in Arab education systems ....	3
Are reading literacy skills higher when children have participated in ECE? .....	4
Does the duration of ECE matter for reading literacy skills of fourth-grade (or sixth-grade) students? .....	5
Conclusions .....	7
References .....	7

### Summary

Many countries all over the world promote reforms aimed at improving access to and the quality of early childhood education (ECE). Among other goals, the preparation of children for schooling and the development of the skills necessary for successful participation in school and society have recently been on many national agendas (SABER, 2013; UNESCO, 2013). In this policy brief we analyze data from eight Arab education systems that participated in the last round of the IEA's Progress in International Reading Literacy Study (PIRLS 2011). The results show that there is a positive relationship between participation in preprimary education, its duration, and student-reading achievement at primary school. Both fourth-grade and sixth-grade students who had participated in ECE outperformed students who had not participated in ECE in almost all education systems analyzed. Furthermore, in about half of the education systems, students who had participated in ECE for more than one year performed better in reading achievement than those who had participated for a shorter time.

### Policy implications

1. It is important to make preprimary education available to all children. Our results show that not all of the PIRLS 2011 fourth-grade (or sixth-grade) students had participated in ECE in the education systems analyzed. Additional analysis, not reported in this policy brief, revealed that children from disadvantaged families and rural areas have a higher probability for non-participation than children from advantaged families and urban areas. At the same time, the analysis indicates that participation in preprimary education would seem to be associated with higher average reading achievement at Grade 4 (or Grade 6). This suggests that providing access to preprimary education to all children, with special focus on children from disadvantaged families and rural areas, seems to be a desirable education policy goal.
2. Policies aimed at increasing student reading achievement should include early access to ECE. Our analysis shows that, in about the half of the analyzed education systems, fourth-grade (or sixth-grade) students who had participated in ECE over a longer period outperformed those who had participated for a shorter period. Providing children with early access to preprimary education could help to improve average student achievement in later schooling.

## Introduction

Preschool education is a major topic on many national educational agendas today. A number of countries and supranational organizations, particularly in the developing regions of the world, have promoted reforms aimed at preparing children for entry to formal schooling (Naudeau, Kataoka, Valerio, Neuman, & Elder, 2010; The World Bank, 2013). Consequently, preschool education participation rates have been steadily rising in many countries since the 1990s, including some of the Arab countries (Mullis, Martin, Foy, & Drucker, 2012; Mullis, Martin, Kennedy, & Foy, 2007). Based on data from the 2011 cycle of PIRLS, all participating education systems indicated that some form of preschool education was available and that about 89 percent (on average, internationally) of the students attended preprimary education programs (Mullis, Martin, Foy, & Drucker, 2012). The vast majority of the PIRLS 2011 participants, including most Arab countries, reported having a national curriculum for preprimary education in place, and in almost all of these countries language, reading, and writing skills were part of the preprimary curriculum.

This is especially important as children starting school show a large variation in their readiness to learn, reflecting differences in their home environment and parental involvement related to social inequalities. The scientific literature suggests that attention to the development of human capital needs to begin when the brain is developing at its fastest and is at its most malleable—at the beginning of life (Atinc & Gustafsson-Wright, 2014). Research evidence also shows that preschool education plays an

important role in a child's future reading achievement (see, for example, Melhuish et al., 2008). The acquisition of early literacy skills prior to school and at the beginning of schooling can have a positive influence on later educational outcomes (Bingham, 2007). Children experiencing early difficulties in reading are likely to lag behind their peers. Later, this may hinder them in the transition from learning to read to reading to learn, which starts, on average, around the fourth year of schooling (Mullis et al., 2007) and may affect academic development in other subjects as well (Lembke & Foegen, 2009). This positive association between educational achievement and participation in preschool education across the participating education systems has also been noted elsewhere, including in the international reports of the Progress on International Reading Literacy Study (PIRLS) 2011 (Mullis, Martin, Foy, & Drucker, 2012). On average, students who participated in preschool had a higher reading achievement at Grade 4 than those who did not. Additionally, students had a higher reading achievement, on average, if they participated longer in preprimary education (i.e., more than one year as compared to one year or less).



## Data and Measures

To explore the association between attendance in preprimary education and student reading achievement, we used data from PIRLS 2011 assessment conducted by the International Association for the Evaluation of Educational Achievement (IEA), which assesses Grade 4 (or Grade 6) reading literacy using representative samples of students from the participating education systems. PIRLS also collects extensive, internationally comparable information on the background characteristics of the students, their parents, teachers, and schools. Our paper relies on data from eight Arab education systems that included all relevant information needed for the analyses: Abu Dhabi, Dubai, Kuwait, Morocco, Oman, Qatar, Saudi Arabia and United Arab Emirates. Although Abu Dhabi and Dubai are sub-national jurisdictions of United Arab Emirates, they participated in the study and related sampling procedures as separate regional benchmarking entities. Our aim was to deliver representative data on the education systems in these regions; in further analyses,

results are reported separately for Abu Dhabi, Dubai and United Arab Emirates. All of the education systems that were analyzed administered PIRLS 2011 in Grade 4, except Kuwait, which tested students in Grade 6; Morocco tested Grades 4 and 6.

Our study utilizes information on attendance and duration of preprimary education as reported by the parents of the students taking part in the study. We also utilized achievement scores on the reading literacy test from PIRLS 2011, where reading literacy is defined as “the ability to understand and use those written language forms required by society and/or valued by the individual.” Taking into account their developmental stage, students are expected to be able to “construct meaning from a variety of texts” (Mullis, Martin, Kennedy, Trong, & Sainsbury, 2009, p. 11).

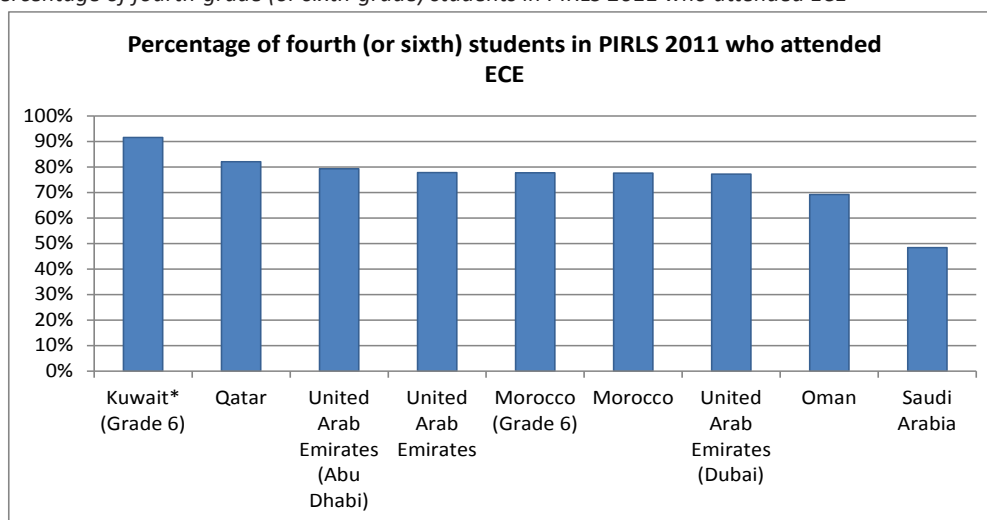
## Participation in early childhood education in Arab education systems

Previous research has shown that ECE is influential to later success in learning (see, for example, Melhuish et al., 2008). Accordingly, many countries have implemented reforms and policy actions to increase access to ECE for all children (The World Bank, 2013). Despite these efforts, the attendance rates still vary substantially across education systems worldwide (Mullis, Martin, Foy, & Drucker, 2012). In order to explore this situation in the selected Arab education systems using data from PIRLS 2011, we calculated the percentage of students who

attended preprimary education.

The results in Figure I show that the ECE attendance rates for most of the education systems is between 70 and 80 percent, with the exceptions being Kuwait and Saudi Arabia. In Kuwait almost all of the students had attended preprimary education (92 percent), whereas only every second student in Saudi Arabia attended preprimary education (48 percent).

Figure I: Percentage of fourth-grade (or sixth-grade) students in PIRLS 2011 who attended ECE



Source: International Organization for the Evaluation of Educational Achievement (IEA), the Progress in International Reading Literacy Study (PIRLS) 2011

\* For Kuwait the number of missing values for the variable containing the information on ECE participation is about 44 percent, whereas in other education systems the number of missing values for this variable is between five and 15 percent; thus, the results for Kuwait have to be interpreted with caution.



## Are reading literacy skills higher when children have participated in ECE?

As shown in the previous section, in some education systems not all of the fourth-grade (or sixth-grade) students from PIRLS 2011 had access to ECE. The purpose of our second analysis was to test whether students who had attended ECE performed better on the reading literacy test in PIRLS 2011 than those who had not attended ECE. According to authors such as Anders (2012), participation in ECE provides children with a wider range of diverse opportunities to learn and more varied learning contexts than they would otherwise experience at home. Thus, positive learning effects can be expected for children participating in ECE.

Our analysis compares the reading achievement between two groups of students: those who had and those who had not participated in ECE; Figure II presents the achievement gaps between these two groups. In all of the education systems analyzed, the differences are in favor of those students who had attended preprimary education; however, the size of the differences varies among the education systems. In Qatar, Morocco, Saudi Arabia, Oman, and Dubai, the differences in achievement are quite large and statistically significant, whereas in Abu Dhabi, United Arab Emirates, and Kuwait, the differences are rather small (between roughly three and ten score points)<sup>1</sup>.

To judge the importance of the achievement gaps for educational policy, it is necessary to consider the attendance rates presented in Figure I. In Saudi Arabia, for example, more than 50 percent of the fourth graders in PIRLS 2011 had not attended preprimary education and the achievement gap between the two groups is roughly 30 score points. In contrast, in United Arab Emirates the coverage rate is almost 80 percent and the achievement gap between the two groups is less than 10 score points. In other words, in Saudi Arabia about half of the fourth graders in PIRLS 2011 had not participated in ECE and performed substantially lower in reading achievement than those who had participated. In the United Arab Emirates, the number of students who had not participated in ECE is

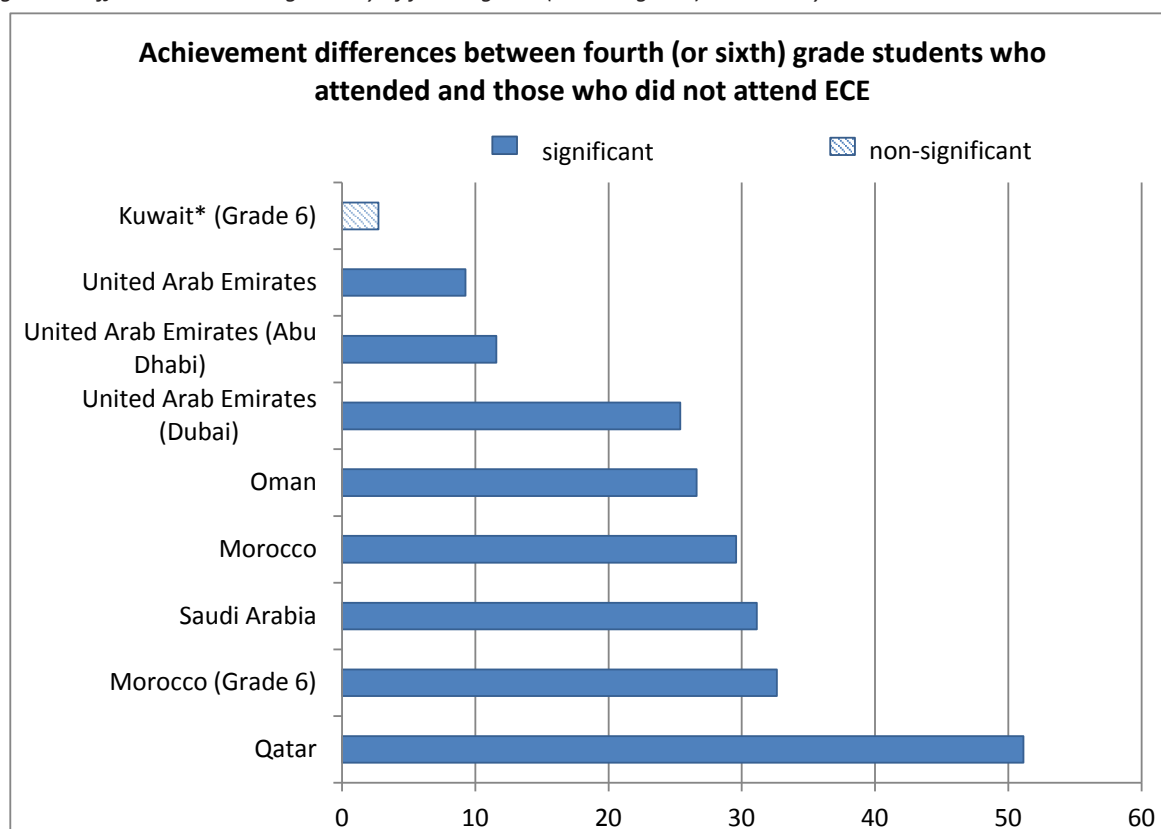
quite low, and their level of reading achievement was only slightly lower than that of the students who had attended ECE. Apparently the urgency of policy action to increase participation in ECE is more evident in those education systems where low ECE attendance rates are found together with large achievement gaps.

In Kuwait, United Arab Emirates, and Abu Dhabi, where the achievement gap between those attending ECE programs and those who did not appears to be rather small, the result could be interpreted twofold: On the one hand, the results might suggest that ECE does not contribute to the education of children as much as expected. This could probably be addressed by improving the quality of preprimary education programs. On the other hand, the lack of differences we found in achievement between children who attended and those who did not attend preprimary education might be due to the fact that the assessment took place after four years (in the case of Kuwait and Morocco sixth-grade students, six years) of schooling. One possible explanation for this effect could be that differences in achievement that were present at the beginning of primary education had vanished; however, positive associations between preprimary education and academic achievement have been confirmed by the results of other major large-scale studies, most notably the Effective Provision of Pre-School Education Project (Sylva, Melhuish, Sammons, Siraj-Blatchford, & Taggart, 2008), Programme for International Student Assessment (OECD, 2011) and the Trends in International Mathematics and Science Study (Martin, Mullis, Foy, & Stanco, 2012; Mullis, Martin, Foy, & Arora, 2012).



<sup>1</sup> PIRLS scores are reported on a theoretical scale that ranges from 0 to 1,000, with an international mean of 500 and a standard deviation of 100.

Figure II: Differences in reading literacy of fourth-grade (or sixth-grade) students by ECE attendance



Source: International Organization for the Evaluation of Educational Achievement (IEA), the international study to measure the progress of literacy in the world (PIRLS) 2011

\* For Kuwait the number of missing values for the variable containing the information on ECE participation is about 44 percent, whereas in other education systems the number of missing values for this variable is between five and 15 percent; thus, the results for Kuwait have to be interpreted with caution.

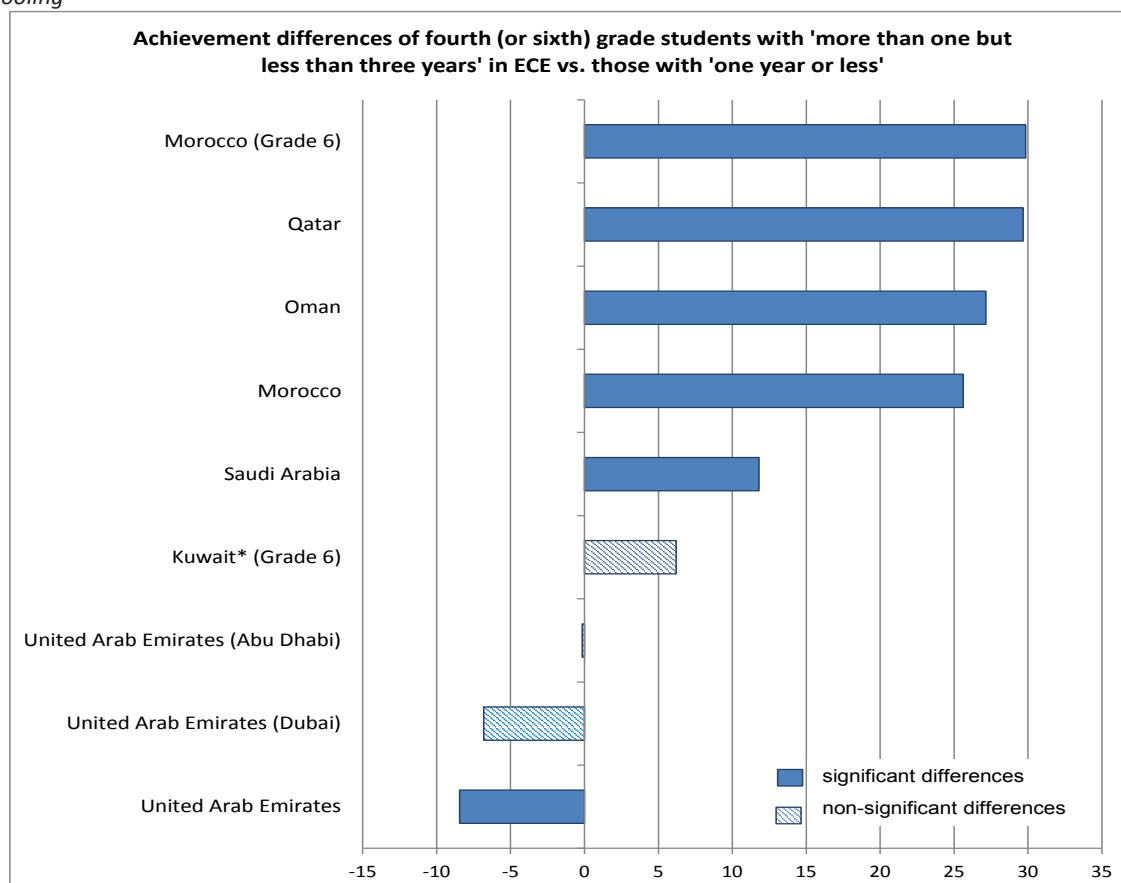


## Does the duration of ECE matter for reading literacy skills of fourth-grade (or sixth-grade) students?

The analyses in previous sections have shown that the reading literacy skills of students in PIRLS 2011 tended to be higher if they had participated in ECE prior to schooling; this was true for all education systems analyzed. In this section we investigate the relationship between the duration of preprimary education and reading literacy skills in Grade 4 (or Grade 6). Based on the literature (Sylva et al., 2008; Wylie & Thompson, 2003), we expect that children remaining longer in ECE will obtain higher reading scores. To measure the duration of ECE participation, we

relied on parents' reports. We calculated the differences in reading achievement between children who participated in preprimary education for 'one year or less' and those who had participated for 'more than one but less than three years'. Additionally, we determined whether the achievement differences are statistically significant, i.e., whether the results can be generalized to all students in the respective education systems.

Figure III: Differences in reading literacy of fourth-grade (or sixth-grade) students depending on duration of ECE before schooling\*\*



Source: International Organization for the Evaluation of Educational Achievement (IEA), the international study to measure the progress of literacy in the world (PIRLS) 2011

\* For Kuwait the number of missing values for the variable containing the information on ECE participation is about 44 percent, whereas in other education systems the number of missing values for this variable is between five and 15 percent; thus, the results for Kuwait have to be interpreted with caution.

\*\* According to the information available, in all analyzed education systems, ECE with an educational component (as explicitly defined by ISCED 0) does not include more than three years of participation. Therefore the analysis includes only children who attended ECE for three years or less.

The results presented in Figure III reveal that performance of the students is positively associated with the duration of ECE in Morocco (both grades), Qatar, Oman, and Saudi Arabia. In the education systems of these countries, children who attended ECE for a longer period ('more than one but less than three years') outperform those who participated in ECE for a shorter period ('one year or less'); the differences are statistically significant. In Kuwait, Abu Dhabi, and Dubai, the differences in reading achievement between those who had participated in ECE for a longer period ('more than one but less than three years') and those for a shorter period ('one year or less') are not significant. In United Arab Emirates, students who stayed in ECE for one year or less performed better in Grade 4 than students who participated in ECE for a longer time.

In summary, the analysis supports the assumption that the duration of ECE attendance is an important factor for later success in school in four of the education systems we analyzed; however, this pattern is not consistent for all of the education systems. One possible reason could be differences in quality of the ECE services provided in each education system. Although this assumption would appear plausible, it is not possible to assess ECE program quality using PIRLS 2011 data.



## Conclusions and policy implications

On the basis of our analysis, we have identified the following policy implications:

1. It is important to make preprimary education available to all children. Our results show that not all of the PIRLS 2011 fourth-grade (or sixth-grade) students had participated in preprimary education in the educational systems analyzed. Additional analysis, not reported in this policy brief, revealed that children from disadvantaged families and rural areas have a higher probability for non-participation than children from advantaged families and urban areas<sup>2</sup>. At the same time, the analysis indicates that participation in preprimary education would seem to be associated with higher average reading achievement at Grade 4 (or Grade 6). This suggests that children who had attended ECE tend to develop higher literacy skills in later schooling. Accordingly, increasing access to preprimary education, particularly with respect to children from disadvantaged families and rural areas, could be a desirable educational policy goal. This would be especially important in education systems where low attendance rates occur together with large achievement gaps between those children who had and had not participated

in ECE.

2. Policies aimed at increasing student reading achievement should include early access to ECE. Our analysis shows that in some education systems children who had participated in ECE over a longer period of time outperformed those children who had participated for a shorter period. Enabling early access to preprimary education could help to improve student average reading achievement later in school; this pattern was observed in four out of the eight education systems analyzed.

Analyzing factors related to the quality of ECE would provide more detailed information about how to support child development in ECE settings (Anders et al., 2012; Pianta et al., 2005). PIRLS 2011, however, is designed to measure reading achievement and associated factors in primary school and consequently does not provide information on the quality of ECE. Participating in international studies designed to measure the quality of ECE programs (for example, the recently developed IEA Early Childhood Education Study)<sup>3</sup> would provide empirical evidence to inform educational policy in this area.

## References

- Anders, Y., Rossbach, H.-G., Weinert, S., Ebert, S., Kuger, S., Lehl, S., Anders, Y., Rossbach, H.-G., Weinert, S., Ebert, S., Kuger, S., Lehl, S., & von Maurice, J. (2012). Home and preschool learning environments and their relations to the development of early numeracy skills. *Early Childhood Research Quarterly*, 27(2), 231–244.
- Atinc, T. M., & Gustafsson-Wright, E. (2014). *Tomorrow's Skilled Workforce Requires Investing in Young Children Today: The Importance of Early Childhood Development*. Retrieved October 8, 2014, from <http://www.brookings.edu/>
- Bingham, G. E. (2007). Maternal Literacy Beliefs and the Quality of Mother–Child Book-Reading Interactions: Associations With Children's Early Literacy Development. *Early Education and Development*, 18(1), 23–49.
- Lembke, E., & Foegen, A. (2009). Identifying Early Numeracy Indicators for Kindergarten and First-Grade Students. *Learning Disabilities Research & Practice* (Blackwell Publishing Limited), 24(1), 12–20.
- Martin, M. O., Mullis, I. V. S., Foy, P., & Stanco, G. M. (2012). *TIMSS 2011 International Results in Science*. Chestnut Hill, MA: Lynch School of Education, Boston College.
- Melhuish, E. C., Phan, M. B., Sylva, K., Sammons, P., Siraj-Blatchford, I., & Taggart, B. (2008). Effects of the Home Learning Environment and Preschool Center Experience upon Literacy and Numeracy Development in Early Primary School. *Journal of Social Issues*, 64(1), 95–114.
- Mullis, I. V. S., Martin, M. O., Foy, P., & Arora, A. (2012). *TIMSS 2011 International Results in Mathematics*. Chestnut Hill, MA: Lynch School of Education, Boston College.
- Mullis, I. V. S., Martin, M. O., Foy, P., & Drucker, K. T. (2012). *PIRLS 2011 International Results in Reading*. Chestnut Hill, M.A.: TIMSS & PIRLS International Study Center, Boston College.
- Mullis, I. V. S., Martin, M. O., Kennedy, A. M., & Foy, P. (2007). *PIRLS 2006 international report: IEA's Progress in International Reading Literacy Study* in primary schools in 40 countries. Chestnut Hill, MA: Boston College.
- Mullis, I. V. S., Martin, M. O., Kennedy, A. M., Trong, K. L., & Sainsbury, M. (2009). *PIRLS 2011 Assessment Framework*. Chestnut Hill, MA: PIRLS International Study Center, Boston College, Lynch School of Education.
- Naudeau, S., Kataoka, N., Valerio, A., Neuman, M. J., & Elder, L. K. (2010). *Investing in Young Children: An Early Childhood Development Guide for Policy Dialogue and Project Preparation*. The World Bank. Retrieved from <http://elibrary.worldbank.org/>
- OECD. (2011). *Lessons from PISA for the United States*. OECD Publishing. Retrieved from <http://www.oecd-ilibrary.org/>
- Pianta, R. C., Howes, C., Burchinal, M., Bryant, D., Clifford, R., Early, D., & Barbarin, O. (2005). Features of Pre-Kindergarten Programs, Classrooms, and Teachers: Do They Predict Observed Classroom Quality and Child-Teacher Interactions? *Applied Developmental Science*, 9(3), 144–159.
- SABER. (2013). *What Matters Most for Early Childhood Development: A Framework Paper*. World Bank.
- Sylva, K., Melhuish, E., Sammons, P., Siraj-Blatchford, I., & Taggart, B. (2008). Final report from the primary phase: pre-school, school and family influences on children's development during Key Stage 2 (age 7-11) (No. Research Report DCSF-RR061). Annesley: Department for Education, Great Britain.
- The World Bank. (2013). *Education - Early Childhood Development (ECD)*. Retrieved August 26, 2013, from <http://web.worldbank.org/>
- UNESCO. (2013). *Toward Universal Learning. Recommendations from the Learning Metrics Task Force*. UNESCO Institute for Statistics and the Center for Universal Education at the Brookings Institute.
- Wylie, C., & Thompson, J. (2003). The Long-term Contribution of Early Childhood Education to Children's Performance—Evidence from New Zealand. *International Journal of Early Years Education*, 11(1), 69–78.

<sup>2</sup> The non-participation rate was higher for fourth-grade (or sixth-grade) students from families with low socio-economic status in all analyzed education systems. Furthermore, in all of the education systems, with the exception of United Arab Emirates, the participation rate was lower for students from rural areas compared to students from urban areas.

<sup>3</sup> The IEA is developing an international large-scale study to evaluate the quality of ECE programs; the data from this study will provide deeper insight into learning and teaching mechanisms in the last year of preprimary education.



Copyright © 2014 ALECSO Tunis

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, electrostatic, magnetic tape, mechanical, photocopying, recording or otherwise without permission in writing from the copyright holder.

Copyedited by Kevin Pfeiffer ([www.tiros.net](http://www.tiros.net))

Design and production by Becky Bliss Design and Production

Layout by Eduardo López ([www.plumaboom.com](http://www.plumaboom.com))

Photo credits: © 123RF.com

To obtain copies of this publication please contact:

[contact@araieq-alecso.org](mailto:contact@araieq-alecso.org)

[www.araieq.alecso.org](http://www.araieq.alecso.org)

This Policy Brief was produced with the collaboration of:

**IEA Data Processing and Research Center  
Research and Analysis Unit**

Authors:

Agnes Stancel-Piatak

Juliane Hencke

Series Editor:

Andrés Sandoval-Hernández

### About ALECSO

The Arab League Educational, Cultural and Scientific Organization (ALECSO) is a specialized inter-governmental agency headquartered in Tunis, essentially concerned with the development and coordination of educational, cultural and scientific activities in the Arab World, and the development of regional and international cooperation in these fields. ALECSO has several missions to carry out in the education field, to support Arab countries member of the LAS in the development of human resources, the modernization of the educational systems, as well as to promote the Arabic language and the Arab-Islamic culture both within and outside the Arab world.

The Arab Regional Agenda on Improving Education Quality (ARAIEQ) is one of ALECSO's major education initiatives, aiming to improve the quality and relevance of education services in the region through regional collaboration. Launched in 2012 with the support of the World Bank, ARAIEQ includes five pillars :

- Arab Program on Education Evaluation and Policy Analysis (APEEPA) hosted by UNESCO's regional bureau in Beirut, who initiated the preparation of these policy briefs, in coordination with IEA.
- The Arab Program on Teacher Policies and Teacher Professional Development (AFTP), based at the Queen Rania Teachers Academy (QRTA) in Amman, Jordan.
- The Arab Program on Curriculum Innovation, Qualifications, and ICTs in Education (APIQIT) hosted by the National Center for Education Technologies (CNTE) in Tunis, Tunisia.
- The Arab Program on Early Childhood Development (APECD), hosted by the regional NGO based in Beirut "Arab Resource Collective (ARC).
- The Arab Program on Entrepreneurship Education and Innovation (APEEI), hosted by the regional NGO Injaz El Arab based in Amman.

The present policy brief aims to propose some issues and recommendations about the analysis of PIRLS results , with regard to the pillar above on Early Childhood Development (APECD).

Please cite this publication as:

Stancel-Piatak, A. & Hencke, J. (2014, November). Participation in Early Childhood Education and Reading Literacy Skills of Fourth-Grade (or Sixth Grade) Students – Results from PIRLS 2011. ALECSO- ARAIEQ Policy Brief Series, No. 2, Hamburg: IEA.

