WHAT DO TEACHERS DO TO PROMOTE STUDENTS' READING LITERACY AT 4TH GRADE? – EVIDENCE FROM IEA PIRLS 2016 STUDY

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ABSTRACT

Reading skills which a child learns from an early age are crucial for student's success or failure in subsequent school years as literacy is closely related to all other school subjects. Learning to read and promotion of reading plays an important role in the development of the personality and attitudes of the child.

Teacher is the one responsible for applied techniques of teaching and learning to read, and methods that are used purposefully lead students to the understanding of a text. It is of great importance for teacher to have a wide arsenal of diverse educational methods and experiences. Primary teachers should have a broad theoretical knowledge base and also be able to teach different reading strategies to help students to reach their full potential as readers. An important factor in developing attitudes towards reading is the ability of reading literacy teachers to get their students to become interested in both – literary works as a source of information and joy, and reading as an activity in general.

The aim of the study is to find out what activities the primary school teachers in Latvia apply to promote their students' reading literacy and how those methods relate to students' achievements in reading. In the study a statistical group comparison is performed using IEA PIRLS 2016 data from teacher questionnaires along with information about student achievement.

Key words: PIRLS, Reading literacy, Reading teachers, Teaching methods, 4th grade.

Introduction

Teachers play a major role in development of students' reading skills and habits (Jose, Raja, 2011). Subsequently reading literacy is a foundation of a further academic success (Delgadová, 2015). To promote students'

reading skills teachers use a large variety of different methods some of them being more effective than others (Allington, Johnston, 2000).

Similarly to other large scale education assessments the IEA (International Association for the Evaluation of Educational Achievement) PIRLS (Progress in International Reading Literacy Study) study also collects information about teachers work patterns in class. Those patterns and methods can be analyzed along with the data about students reading achievement to see how application of different approaches is linked to achievement scores of 4th graders in PIRLS test.

Aim of the Study

The aim of the study is to find out what activities the primary school teachers in Latvia apply to promote their students' reading literacy and how those methods relate to students' achievements in reading.

The research question is: What teaching strategies relate to higher 4th grade students' achievement in PIRLS 2016 reading literacy assessment?

Methodology

For the analysis Latvian data from PIRLS 2016 were used. PIRLS is a reading literacy study targeting young students in their fourth year of schooling and being conducted internationally every five years (Mullis, Martin, 2015).

PIRLS not only assesses students' reading literacy, but also employs surveys of students, their parents, teachers and school principals to collect a valuable information about the context factors. These surveys provide the data which permits linking student assessment results to certain background characteristics and drawing conclusions about the influence of the surrounding environment on the results. In Latvia around 4000 students, their parents and teachers, as well as school principals from both Latvian language instruction and Russian language instruction schools participated in PIRLS 2016 study.

The centerpoint of PIRLS achievement scale is set constant at 500 points and represents the mean of the overall achievement distribution in the first cycle of the study at 2001 (National Center for Education Statistics, n.d.). The standard deviation of the PIRLS scale is 100, and the scale is kept constant in each administration of the study.

For this study the data from PIRLS 2016 teacher questionnaire were used along with students' reading achievement scores from the test. The analysis of the data was performed using the statistical software IBM SPSS 22 and

IEA IDB Analyzer. Descriptive statistics (frequency, means, standard errors and percentages) and significance tests were performed.

Results

For the sake of answering the research question in this study the data from two questions from PIRLS 2016 teacher questionnaire were analyzed.

The first question of interest was: How often do you do the following in teaching reading to this class? The list of methods included in the question is provided in the 1st column of Table 1. Teachers could pick a frequency of application for each method from options:

- Every or almost every lesson,
- About half the lessons,
- Some lessons,
- Never.

For analytical purposes authors grouped teachers' answers in following two groups of comparison:

1. Every or almost every lesson,
2. Less frequently than almost every lesson.

Table 1 shows percentages of students whose teachers answered accordingly and average scale scores in PIRLS test for each group of students. The last column in Table 1 indicates if the difference in achievement scores between the groups is statistically significant. For example, 28 percent of students have teachers who provide materials that are appropriate for the reading levels of individual students at every or almost every lesson, and reading achievement level of this group or students is significantly higher than the average achievement of students whose teachers use this individual approach less often.

The opposite relation can be noticed for providing an individual feedback for each student. Students whose teachers give individual feedback less often have higher test results. But one must be cautious with the cause-effect interpretation here. Most likely these results of the analysis indicated that lower performing students are needier for the individual feedback and therefore are given it more frequently.

Teachers' frequently linking new content to students' prior knowledge and encouraging students to develop their understandings of the text are associated with higher student reading achievement. It can be acknowledged as positive fact that about 80 percent of 4th grade students in Latvia experience this very often.

Table 1. Comparison of frequency of usage of different teaching methods with the average reading achievement scores

	Every or almost every lesson		Less frequently than every lesson		Difference statistically significant
	Percent of students	Average scale score (s.e.)	Percent of students	Average scale score (s.e.)	
Provide reading materials that match the students' interests	49	560 (2,9)	51	556 (2,7)	No
Provide materials that are appropriate for the reading levels of individual students	28	563 (3,1)	72	555 (2,2)	Yes
Link new content to students' prior knowledge	78	561 (2,0)	22	546 (4,0)	Yes
Encourage students to develop their understandings of the text	84	560 (1,9)	16	545 (4,4)	Yes
Encourage student discussions of texts	84	559 (2,0)	16	550 (5,0)	No
Encourage students to challenge the opinion expressed in the text	26	562 (3,6)	74	556 (2,2)	No
Use multiple perspectives (among students and texts) to enrich understanding	42	562 (3,0)	58	554 (3,0)	No
Give students time to read books of their own choosing	16	554 (5,1)	84	559 (1,8)	No
Provide an individual feedback for each student	36	553 (3,0)	64	561 (2,0)	Yes

The second question from the PIRLS teacher questionnaire of focus for this study was: How often do you ask the students to do the following things to help develop reading comprehension skills or strategies? The list of skills and strategies included in the question is provided in the 1st column of Table 2. Teachers could choose an answer from the following list of frequencies:
- Every or almost every day,
- Once or twice a week,
- Once or twice a month,
- Never or almost never.

And as previously authors of this paper have grouped teachers' answers in following two groups of comparison:

1. Every or almost every day,
2. Less often than every day.

Three indications from Table 2 are most noteworthy – only about 20 percent of students are frequently asked to compare what they have read with other things they have read, make predictions about what will happen next in the text they are reading and determine the author's perspective or intention in the text. Those 4th grade students whose teachers often ask them to practice the approaches mentioned above show significantly higher results in reading literacy. The results show that application of these methods should be encouraged in primary grades in Latvia.

Table 2. Comparison of frequency of promotion of different reading skills and strategies with the average reading achievement scores

	Every or almost every day		Less often than every day		Difference statistically significant
	Percent of students	Average scale score (s.e.)	Percent of students	Average scale score (s.e.)	
Locate information within the text	80	560 (1,9)	20	550 (3,8)	Yes
Identify the main ideas of what they have read	71	559 (2,1)	29	555 (3,7)	No
Explain or support their understanding of what they have read	65	562 (2,1)	35	550 (3,0)	Yes
Compare what they have read with experiences they have had	50	561 (2,7)	50	554 (2,5)	No
Compare what they have read with other things they have read	20	569 (4,0)	80	555 (2,0)	Yes
Make predictions about what will happen next in the text they are reading	22	566 (4,2)	78	556 (2,0)	Yes
Make generalizations and draw inferences based on what they have read	59	559 (2,6)	41	556 (3,2)	No
Describe the style or structure of the text they have read	10	566 (5,9)	90	557 (1,8)	No
Determine the author's perspective or intention	21	566 (4,5)	79	556 (1,9)	Yes

There has been a lot of research in the field devoted to finding the most optimal class size (e.g., De Paola et al., 2013; Hoxby, 2000; Bonesrønning, 2003) and providing various results. In this study the authors analyzed how is the class size linked to teachers' application of different methods of teaching reading. Table 3 shows what percentage of students in each of three categories of class size experience certain teaching approaches every or almost every lesson. For example, providing materials that are appropriate for the reading levels of individual students is more often practiced in small classrooms – approximately 45 percent of students who are studying in a class with no more than 12 classmates experience this method from their reading teacher every or almost every lesson. Comparatively in classes of more that 24 children only 21 percent of students receive individually targeted reading materials almost every lesson. Since according to previously mentioned results of the study this method is related to higher average reading achievement of 4th graders (as shown in Table 1) in this case large class size is not an advantage.

Table 3. Use of different teaching methods depending on class size

Every or almost every lesson	Percent of students		
	Class size up to 12 students	Class size from 13 to 24 students	Class size bigger than 24 students
Provide reading materials that match the students' interests	47,9%	56,9%	41,4%
Provide materials that are appropriate for the reading levels of individual students	44,5%	29,8%	21,4%
Link new content to students' prior knowledge	68,3%	74,6%	83,5%
Encourage students to develop their understandings of the text	80,8%	82,6%	87,6%
Encourage student discussions of texts	89,5%	82,0%	83,3%
Encourage students to challenge the opinion expressed in the text	25,9%	18,6%	33,6%
Use multiple perspectives (among students and texts) to enrich understanding	47,9%	35,0%	47,8%
Give students time to read books of their own choosing	9,6%	20,3%	12,7%
Provide an individual feedback for each student	53,4%	43,6%	21,7%

Results of similar analysis are presented in Table 4. It can be noticed that fewer students form small classes are frequently asked to make predictions about what will happen next in the text they are reading than

their counterparts from large groups. A recommendation can be drawn that teachers who work with small number of students should use this approach of promoting reading literacy development more often since it has showed a positive relationship with achievement level as shown in Table 2.

Table 4. Use of tasks for development of reading comprehension skills or strategies depending on class size

Every or almost every day	Percent of students		
	Class size up to 12 students	Class size from 13 to 24 students	Class size bigger than 24 students
Locate information within the text	85,6%	75,8%	83,6%
Identify the main ideas of what they have read	64,7%	70,3%	73,5%
Explain or support their understanding of what they have read	67,3%	62,0%	67,8%
Compare what they have read with experiences they have had	42,1%	47,9%	55,3%
Compare what they have read with other things they have read	16,6%	16,3%	26,0%
Make predictions about what will happen next in the text they are reading	13,0%	18,2%	28,4%
Make generalizations and draw inferences based on what they have read	58,2%	56,2%	62,4%
Describe the style or structure of the text they have read	11,8%	10,1%	10,0%
Determine the author's perspective or intention	15,5%	16,0%	28,5%

Contrary to results of a study carried out by Ting and Spyros (2017) about class size effects on PIRLS results in Romania, analysis of Latvian data done by authors of this paper show that bigger number of students in class on average is connected to higher academic performance (see Figure 1). This result provides a support for a need of further school optimization process in Latvia.

An OECD (Organisation for Economic Co-operation and Development) TALIS (Teaching and Learning International Survey) 2018 study has indicated that the population of teachers in Latvia is on average a little older than in other countries which took part in the study (OECD, 2019). Knowing this, authors of the paper performed a data analysis to capture if there is a difference in application of methods for teaching reading depending on a teachers' age.
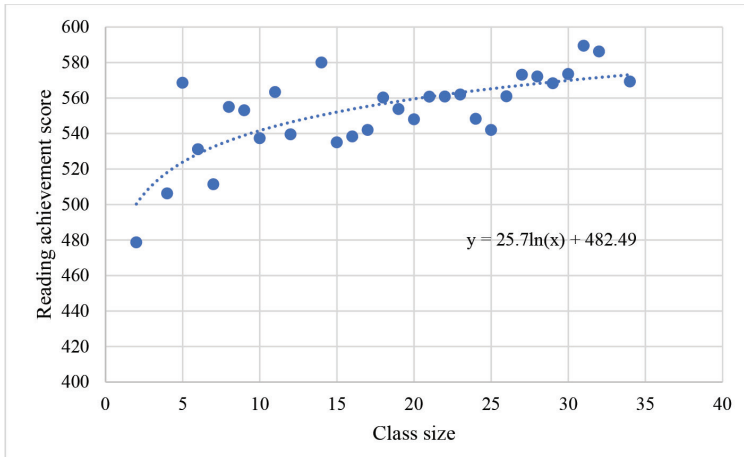
Figure 1. Reading achievement and class size

Table 5 presents Latvian 4th grade students split in three groups according to the age of their teacher and what percentage of students in each of these three groups experience a particular pedagogical approach every or almost every lesson. The results of the analysis display that with age it is more common for teachers to link new content to students' prior knowledge and to provide an individual feedback for each student. More than a half (55 percent) of students whose reading teacher is of age 60 or higher receive reading materials that match the students' interests every or almost every lesson comparatively to 34 percent of such students whose teachers are younger than 39. On the other hand, younger teachers encourage student discussions of texts even more than their older counterparts even though this method in general seems to be very popular in Latvia.

Table 5. Percentage of students who experience different methods according to teacher's age

Every or almost every lesson	Percent of students		
	Teachers' age up to 39 years	Teachers' age from 40 to 59 years	Teachers' of age of 60 or higher
Provide reading materials that match the students' interests	34,2%	50,2%	55,0%
Provide materials that are appropriate for the reading levels of individual students	19,6%	29,6%	29,2%
Link new content to students' prior knowledge	56,7%	79,2%	86,4%
Encourage students to develop their understandings of the text	84,1%	83,0%	91,0%

Every or almost every lesson	**Percent of students**		
	Teachers' age up to 39 years	**Teachers' age from 40 to 59 years**	**Teachers' of age of 60 or higher**
Encourage student discussions of texts	93,6%	82,6%	80,0%
Encourage students to challenge the opinion expressed in the text	23,2%	26,5%	25,8%
Use multiple perspectives (among students and texts) to enrich understanding	52,7%	36,7%	56,5%
Give students time to read books of their own choosing	18,8%	14,9%	16,1%
Provide an individual feedback for each student	23,4%	36,1%	42,4%

Differences in approaches of teaching reading comprehension skills and strategies depending on teachers' age are illustrated in Table 6. Teachers of older age more often ask their students to:
- Locate information within the text,
- Identify the main ideas of what they have read,
- Compare what they have read with other things they have read,
- Make generalizations and draw inferences based on what they have read, and
- Determine the author's perspective or intention.

In general, it can be witnessed that a larger proportion of students who are taught by teachers of at least 60 years of age experience meaningful tasks which enhance development of their reading literacy skills more often.

Table 6. Percentage of students who experience different tasks for development of reading comprehension skills or strategies according to teacher's age

Every or almost every day	**Percent of students**		
	Teachers' age up to 39 years	**Teachers' age from 40 to 59 years**	**Teachers' of age of 60 or higher**
Locate information within the text	62,9%	83,4%	81,6%
Identify the main ideas of what they have read	60,8%	68,9%	86,8%
Explain or support their understanding of what they have read	44,4%	69,4%	63,4%
Compare what they have read with experiences they have had	52,5%	49,2%	52,7%
Compare what they have read with other things they have read	5,4%	20,3%	32,1%

Every or almost every day	Percent of students		
	Teachers' age up to 39 years	Teachers' age from 40 to 59 years	Teachers' of age of 60 or higher
Make predictions about what will happen next in the text they are reading	16,5%	22,0%	25,0%
Make generalizations and draw inferences based on what they have read	44,2%	60,1%	66,0%
Describe the style or structure of the text they have read	8,0%	9,0%	17,6%
Determine the author's perspective or intention	17,9%	18,3%	36,3%

Results of this study show situation in Latvia and therefore cannot be generalized internationally. Authors of the paper also note that for more precise interpretation of results an in-depth analysis should be performed in further studies by controlling effects of different context factors, e.g. geographical placement of school, school type etc.

Conclusions

Main findings of the study show that:
- Frequent use of some teaching methods lead to higher reading achievement.
- On average the achievement level in Latvia is higher in bigger classes.
- Class size also determines application of some reading development methods.
- Use of different pedagogical methods is partly determined by teachers age (length of service and therefore – experience).

Based on results of the study following recommendations for teachers can be drawn. It is suggested that reading teachers of primary grades in Latvia should do the following as frequent as possible:
- Provide materials that are appropriate for the reading levels of individual students;
- Link new content to students' prior knowledge;
- Encourage students to develop their understandings of the text.

It is recommended for all subject teachers as frequent as possible to ask their students to:
- Locate information within the text;
- Explain or support their understanding of what they have read;
- Compare what they have read with other things they have read;

- Make predictions about what will happen next in the text they are reading;
- Determine the author's perspective or intention.

References

Allington, R. L., Johnston, P. H. (2000). What Do We Know about Effective Fourth-Grade Teachers and Their Classrooms? *CELA Research Report*. Retrieved from https://eric.ed.gov/?id=ED447494.

Bonesrønning, H. (2003). Class Size Effects on Student Achievement in Norway: Patterns and Explanations. *Southern Economic Journal*. https://doi.org/69.952-965. 10.2307/1061660.

De Paola, M., Michela Ponzo, P., Scoppa, V., Ponzo, M. (2013). Class size effects on student achievement: heterogeneity across abilities and fields. *Education Economics*. https://doi.org/10.1080/09645292.2010.511811.

Delgadová, E. (2015). Reading Literacy as One of the Most Significant Academic Competencies for the University Students. *Procedia - Social and Behavioral Sciences*. 178. 48–53. https://doi.org/10.1016/j.sbspro.2015.03.145.

Hoxby, C. (2000). The Effects of Class Size on Student Achievement: New Evidence from Population Variation. *The Quarterly Journal of Economics*, 115(4), 1239-1285. Retrieved from http://www.jstor.org/stable/2586924.

Jose, G. R., Raja, B. W. D. (2011). Teachers' Role In Fostering Reading Skill: Effective And Successful Reading. *i-manager's Journal on English Language Teaching*, 1(4), 1–10. https://doi.org/10.26634/jelt.1.4.1599.

Mullis, I. V. S., Martin, M. O. (Eds.). (2015). PIRLS 2016 Assessment Framework (2nd ed.). Retrieved from http://timssandpirls.bc.edu/pirls2016/framework.html.

National Center for Education Statistics. (n.d.). PIRLS and ePIRLS Results. Retrieved from https://nces.ed.gov/surveys/pirls/pirls2016/tables/pirls2016_table01.asp.

OECD. (2019). TALIS 2018 Results (Volume I): Teachers and School Leaders as Lifelong Learners. OECD Publishing, Paris, https://doi.org/10.1787/1d0bc92a-en.

Ting, S., Spyros, K. (2017). Class size effects on reading achievement in Europe: Evidence from PIRLS. *Studies in Educational Evaluation*, 53, 98–114. https://doi.org/10.1016/j.stueduc.2017.04.001.