Reading on Paper or Reading digitally?

A reflection on administering ePIRLS 2016 in South Africa

Presenters

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Aim of presentation

Examine the current status, challenges and implications of ICT availability in South Africa for Grade 4 reading literacy achievement

The study (brief overview)

ePIRLS Background to Study

- ePIRLS is an extension to PIRLS 2016
- Only 14 countries participated in the study
- In South Africa it was a multiple case study in nine schools

ePIRLS: simulated online reading

- Take the ePIRLS assessment online
- http://pirls2016.org/epirls/take-the-epirls-assessment/

Theoretical point of departure

- ePIRLS 2016 international results = significant differences 12 out of 14 countries between the **online reading** and **paper-based reading** (Mullis, Martin, Foy & Hooper, 2017b).

- **Online reading** and **paper-based reading** are highly correlated

Theoretical point of departure

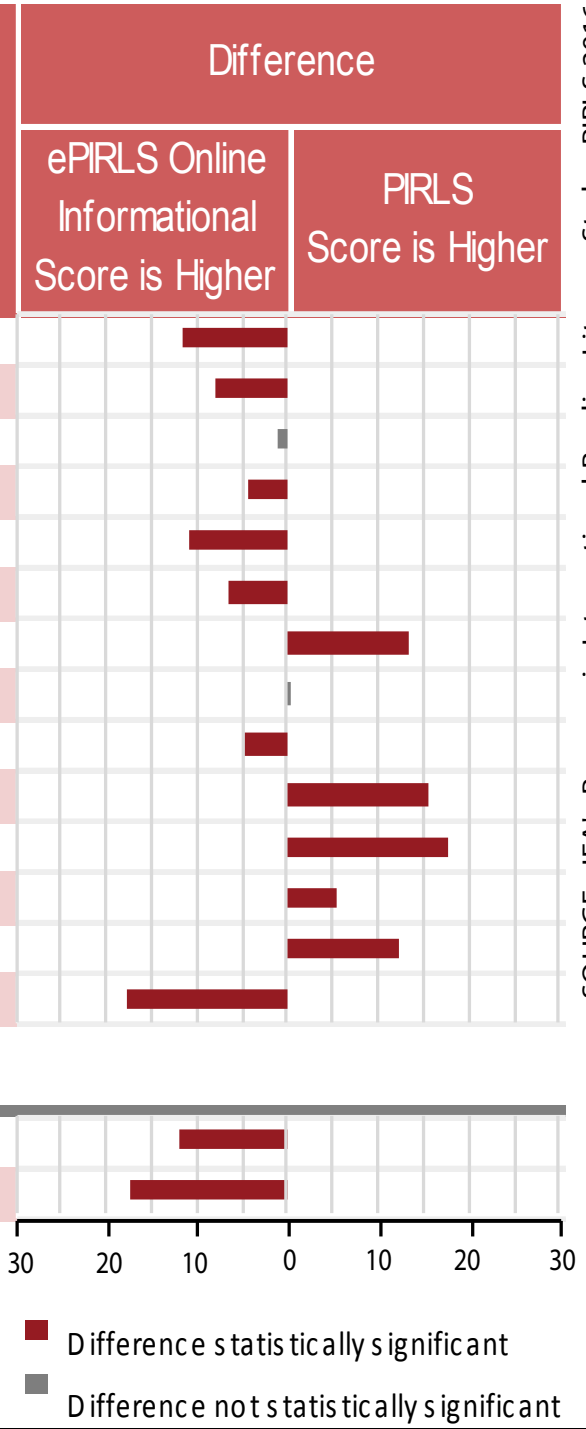
- When learners are **well-prepared to read paper texts** and **exposed to digital reading** in school, they are likely to be proficient in online-reading (Mullis, Martin, Foy & Hooper, 2017a), which includes:

  - ❑ navigating simulated internet pages
  - ❑ navigating interactive content
  - ❑ searching for information
  - ❑ avoiding distracting elements (example: advertisements)

- Paper-based reading literacy skills should be developed **in conjunction** with online reading literacy skills

Achievement of ePIRLS 2016 countries

Country	Online	Paper	Difference
Singapore	588 (3,0)	576 (3,1)	12 (0,8)
Norway (5)	568 (2,2)	560 (2,3)	8 (1,6)
Ireland	567 (2,5)	566 (2,8)	1 (1,2)
Sweden	559 (2,3)	555 (2,4)	4 (1,1)
≡ Denmark	558 (2,2)	548 (2,3)	11 (1,7)
† United States	557 (2,6)	550 (2,9)	7 (1,2)
Chinese Taipei	546 (2,0)	559 (2,0)	-13 (1,0)
12 Canada	543 (3,2)	543 (3,3)	0 (1,5)
Israel	536 (2,3)	532 (2,5)	5 (1,2)
Italy	532 (2,1)	548 (2,4)	-16 (1,7)
Slovenia	525 (1,9)	543 (2,0)	-18 (1,0)
Portugal	522 (2,2)	528 (2,3)	-5 (1,2)
1 Georgia	477 (3,3)	489 (3,1)	-12 (2,1)
United Arab Emirates	468 (2,2)	451 (2,7)	18 (1,2)
Benchmarking Participants			
Dubai, UAE	528 (1,6)	516 (1,9)	12 (1,0)
Abu Dhabi, UAE	431 (4,1)	414 (4,8)	17 (2,2)



SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Achievement of ePIRLS 2016 countries

Learners scored sig higher in online assessment than on paper:

	Online	Paper	Difference
United Arab Emirates	468	451	17
Abu Dhabi, UAE	431	414	17
Singapore	588	576	12
Dubai, UAE	528	516	12
Denmark	558	548	10

Achievement of ePIRLS 2016 countries

Learners scored sig higher in paper assessment than online:

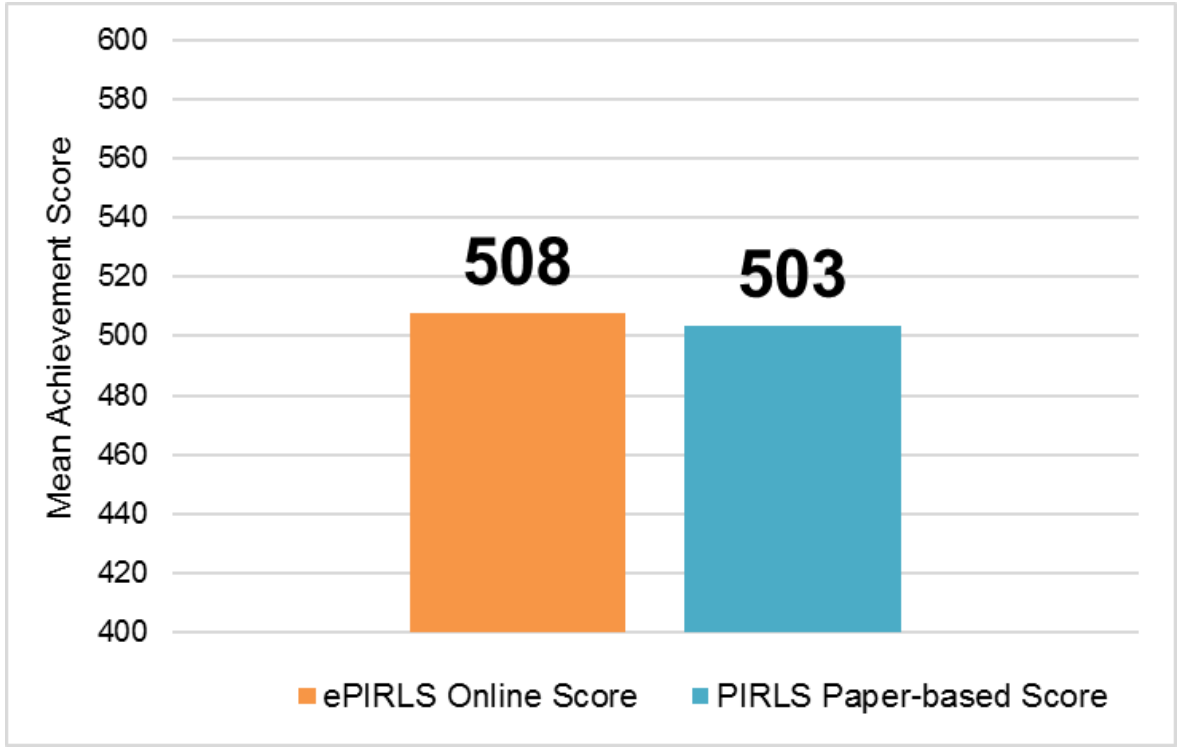
	Online	Paper	Difference
Slovenia	525	543	-18
Italy	532	548	-16
Chinese Taipei	546	559	-13
Georgia	477	489	-12
Portugal	522	528	-6

Main Objectives of ePIRLS

- Assess reading literacy achievement and compare it to online-reading achievement in a small Grade 5 sample

- Investigate the feasibility of conducting an ICT study of this type in South Africa

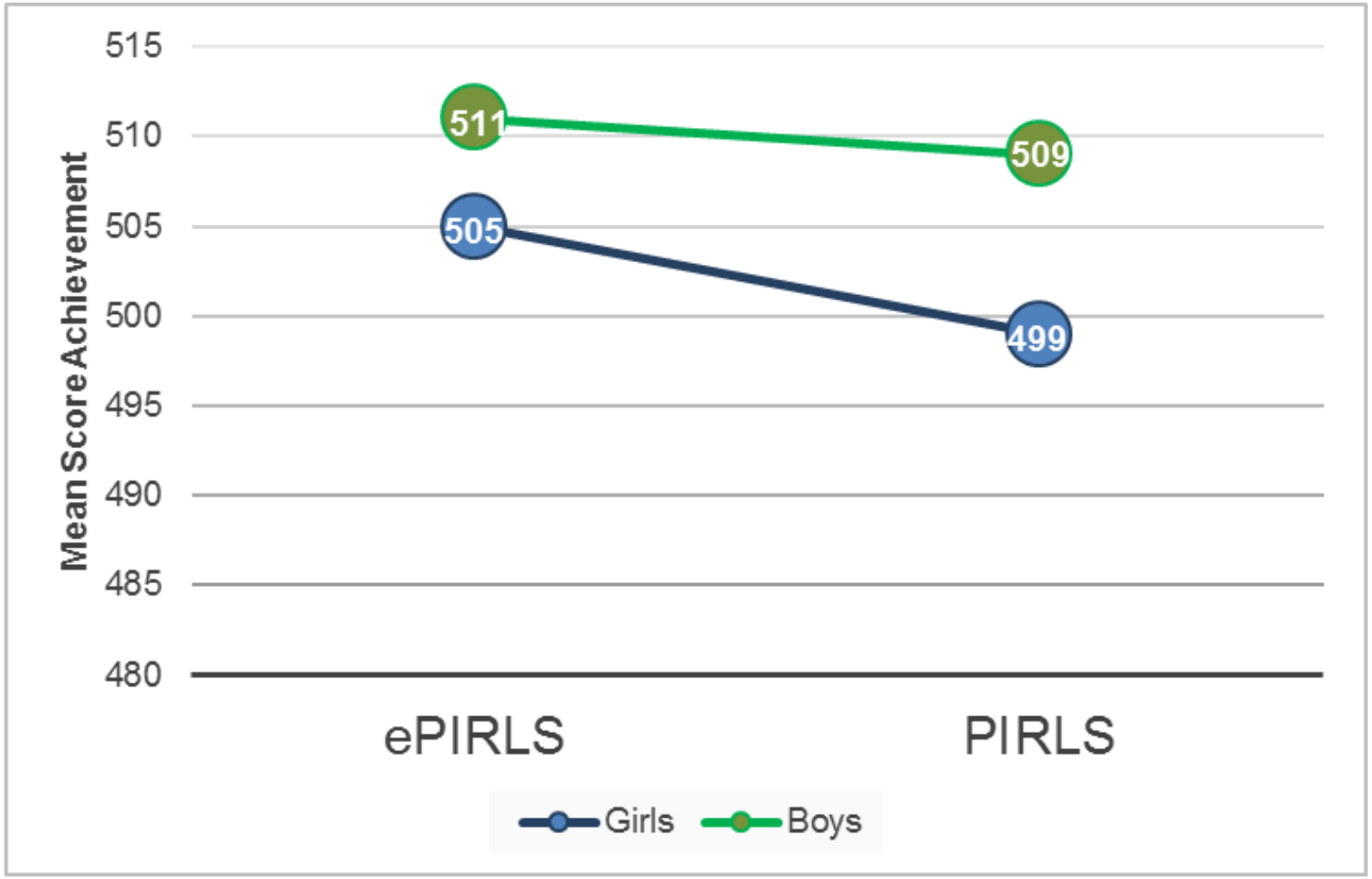
ePIRLS achievement in South Africa



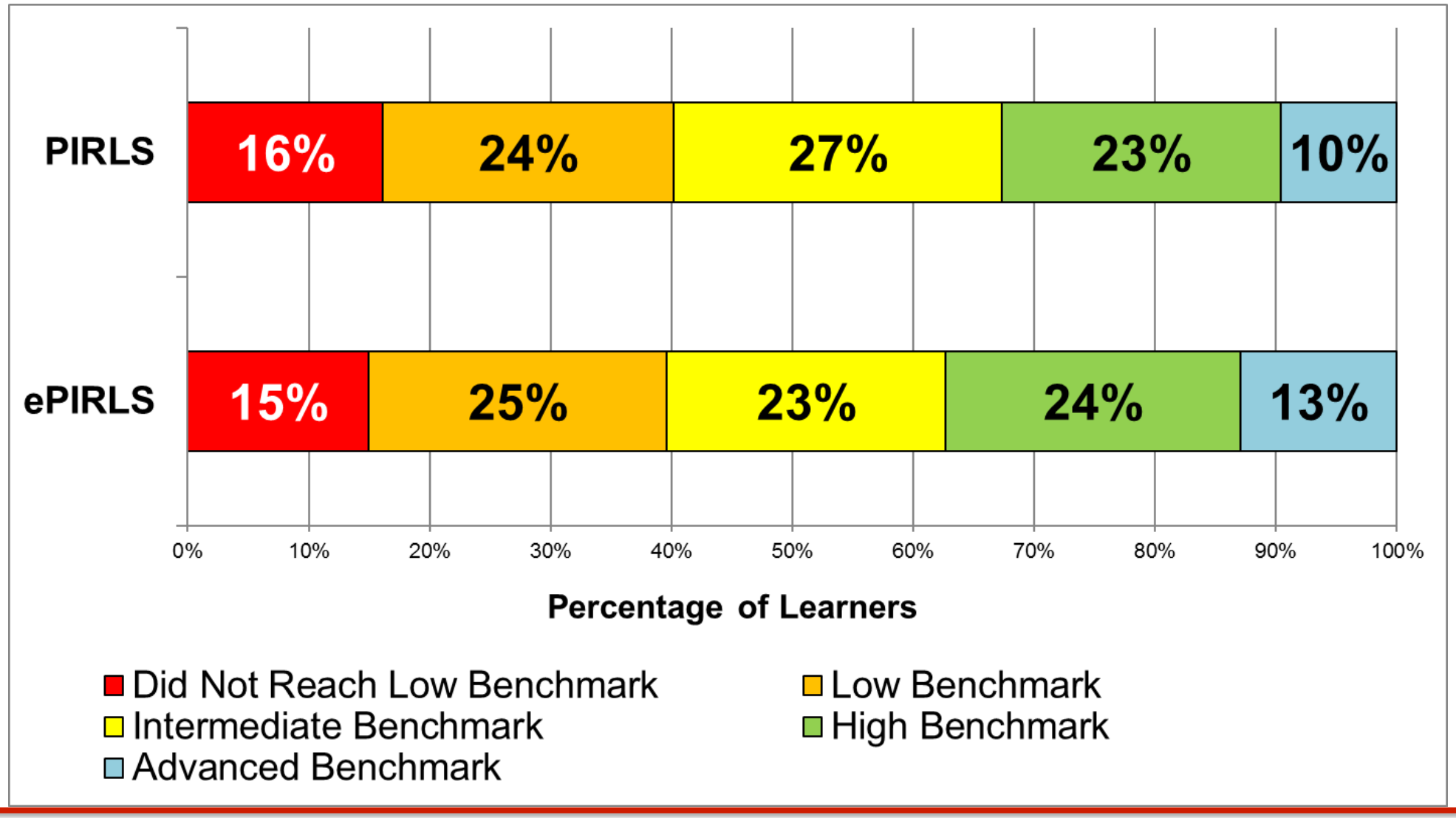
- Results from the small sample in Gauteng had achievement equivalent to the international PIRLS centre point of 500

ePIRLS achievement by Gender

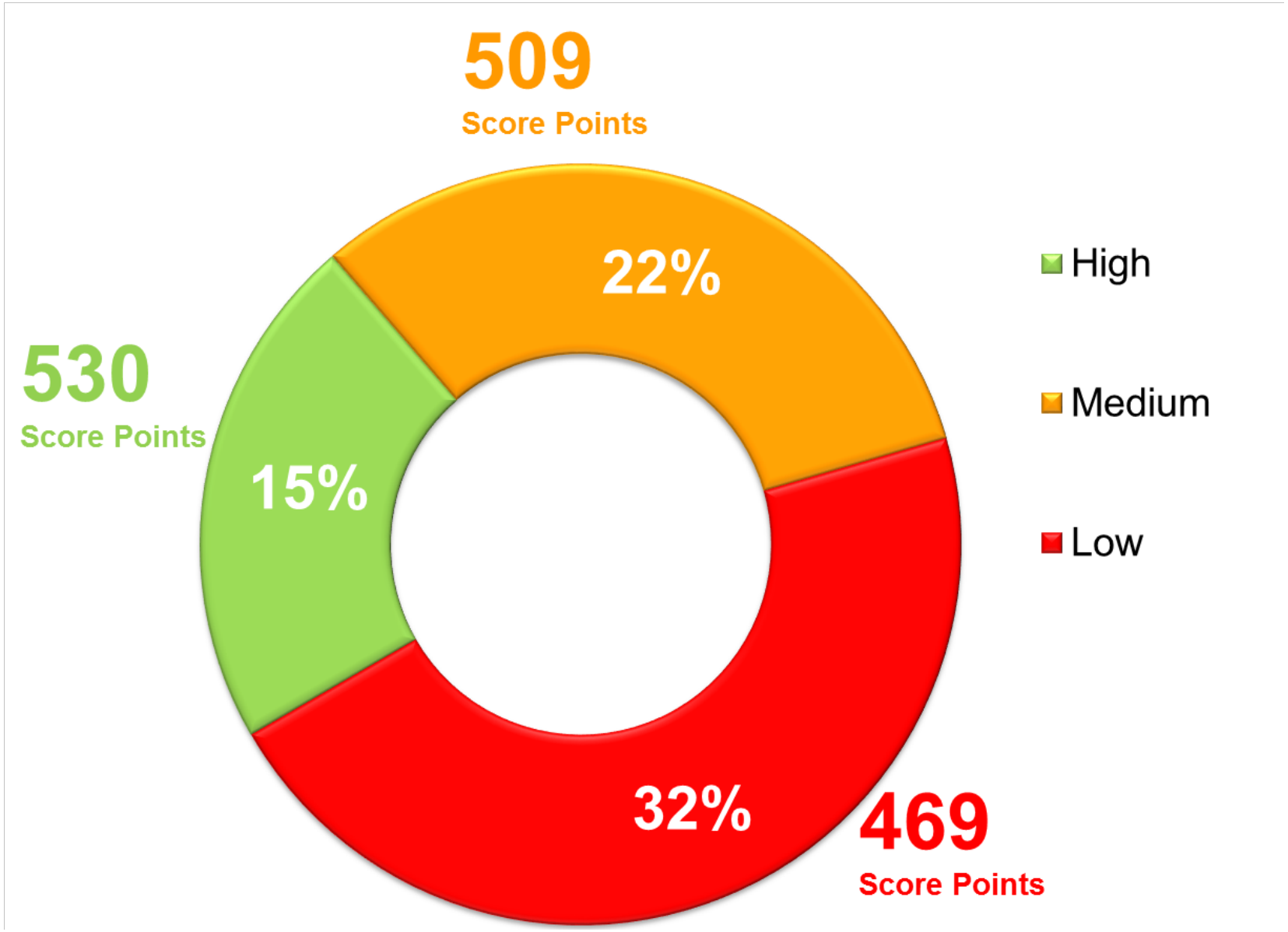
No sig difference for boys & girls in ePIRLS achievement



ePIRLS Benchmark Attainment



Efficacy with using computers



Research Questions

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1) What is the **current status** of ICT availability for learning and teaching reading literacy in Grade 4?

2) When controlling for other pertinent variables such as **SES, school location and language**, is ICT availability a predictor of reading literacy achievement?

Research Questions

3) Does **regular use of computers or tablets** in the classroom influence reading literacy achievement?

4) What are the **challenges** of assessing online reading achievement in the South African context?

5) What are the **implications** of the ePIRLS results and the ICT challenges?

Samples

Participants
National Grade 4 Sample (11 languages)

2011: **15 744** learners in **341** schools

2016: **12 810** learners in **293** schools

Total Sample: **28 554** learners in **634** schools

ePIRLS Multiple Case Study

2016: **277 learners** in **9 schools**

Gauteng only, English LoLT schools, Grade 5

Methods

Data Analysis Methods

- Descriptive analysis with the IEA's International Database **(IDB) Analyzer software** (SPSS plug-in)

- Nationally representative sample: **Multi-level modelling** with the Hierarchical Linear and Nonlinear Modeling Program (HLM 7) to control for between school variance

- IDB analyzer for ePIRLS analysis

Results

Current status of ICT resources:

Computers available for school or classroom teaching and learning Grade 4

ITC Availability		2011	2016
African language schools	School Computers	51%	33%
	Classroom Computer	19%	7%
English or Afrikaans school	School Computers	76%	61%
	Classroom Computer	31%	9%

Current status of Paper-based resources:
Libraries available for school or classroom teaching and learning Grade 4

Paper-based Resources		2011	2016
African language schools	School Library	34%	31%
	Classroom Library	60%	39%
English or Afrikaans school	School Library	63%	58%
	Classroom Library	79%	66%

ICT availability as predictor of reading literacy achievement

	2011 Grade 4 PIRLS National Sample				**2016** Grade 4 PIRLS National Sample			
Fixed effects	**PEV***	**β**	**SE**	***p***	**PEV***	**β**	**SE**	***p***
Null model	54,97%	318,49	5,08	0,00	40,64%	318,22	4,29	0,00
Learner level (within)								
Gender (1 = girl; 2 = boy)		**-33,62**	2,37	0,00		**-50,30**	2,48	0,00
School level (between)	40,13%				24,36%			
SES School Composition		4,32	9,48	0,65		**32,41**	8,25	0,00
African Lang vs not school		**76,70**	11,72	0,00		**43,15**	11,23	0,00
School Location		**19,80**	6,52	0,00		**15,43**	4,94	0,00
Province		2,83	2,11	0,18		**4,18**	1,68	0,01
School Computers		1,91	10,09	0,85		-16,99	11,37	0,14
Classroom Computers		10,96	11,94	0,36		**35,59**	15,02	0,02
Classroom Library		10,93	11,28	0,33		5,81	9,67	0,55
School Library		18,04	9,96	0,07		-4,25	8,20	0,61
PEV* = Null model - Estimated model (%)	14,84%				16,28%			

*Proportion of explained variance

β = Unstandardised regression coefficients on scale of 0 – 100

ICT usage a predictor of reading literacy achievement

	2011 Grade 4 PIRLS National Sample				**2016** Grade 4 PIRLS National Sample			
Fixed effects	PEV*	β	SE	*p*	PEV*	β	SE	*p*
Null model	63,67%	337,06	9,46	0.000	54,64%	363,39	11,80	0,00
Learner level (within)	Gender	**-33,61**	4,32	0,00		**-42,16**	6,52	0,00
School level (between)	41,70%				30,68%			
African Lang vs not school		**148,09**	21,65	0,00		**138,47**	30,18	0,00
Look up information on the internet		**-73,56**	27,65	0,01		-8,38	31,23	0,79
Read stories or other texts on the computer		26,41	30,43	0,39		9,44	19,47	0,63
Use the computer to write stories or other texts		51,60	32,73	0,12		-31,36	28,58	0,29
PEV* = Null model - Estimated model (%)	21,97%				23,96%			

*Proportion of explained variance

β = Unstandardised regression coefficients on scale of 0 – 100

2/3 of respondent from African lang school

ePIRLS Challenges

- Schools with functional computer labs were a requirement of ePIRLS
- Initially a database was provided by GDE (Feb 2015)
- List was required to contain only primary schools with functional computer labs and English LoLT

ePIRLS Challenges

- Initial list provided contained 2 161 schools
- Initial cleaning: removed high schools & adult centres = 236 schools remained
- After phoning schools and further cleaning, list was reduced to 176 schools

ePIRLS Challenges

- School visits revealed that the LoLT of some schools were incorrect, as well as ICT reported capacity
- List was reduced to 36 schools
- Stats Canada drew a random sample of 25 schools in Gauteng

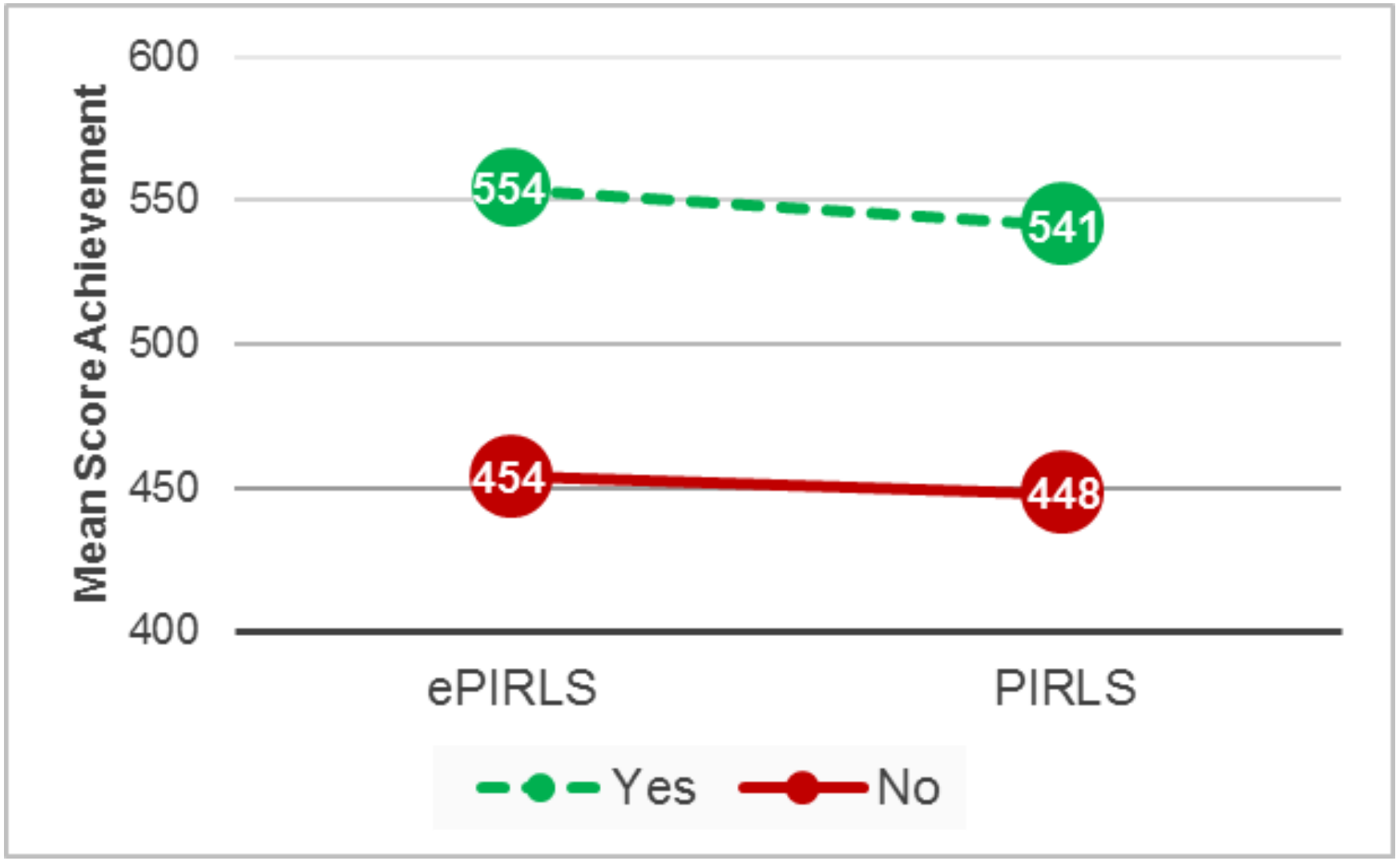
ePIRLS Challenges

- When planning for fieldwork commenced, more schools without any ICT capacity was found as well as incorrect LoLT
- Eventually 15 schools were asked to participate and 9 agreed
- Consequence = SA **removed** from international report.
- A random sample could not be drawn. The study was reduced to a multiple case study

ePIRLS Challenges

- Despite schools having computer labs, many were not functional
- Laptops were rented (increased expense)
- After fieldwork commenced (Feb 2016), it was found that **4 out of the 5 schools** had not used their ICT resources in the last 3 years

School uses computer lab



ePIRLS regression models

	Paper-based Reading Score			Online Reading Score		
	β	SE	*t*	*β*	SE	*t*
(CONSTANT)	556,02	18,94	29,36	568,31	17,74	32,03
School uses ICT	**80,51**	23,96	3,36	**90,98**	21,81	4,17
Gender (girl/boy)	-16,31	20,68	-0,79	-12,63	21,85	-0,58
ICT Self-efficacy	16,31	9,02	1,81	**17,27**	7,52	2,30

Conclusions

Conclusions

- In each subsequent cycle of PIRLS **less access** to ICT resources for schools and classrooms were reported

- But when controlling for between-school variance, economic factors and language of school: ICT resources had **no significant influence** on reading literacy achievement

Conclusions

- Significant predictors of reading literacy achievement are **school location**, **LoLT (African vs non-African language)**, **SES composition** of school and **gender**

- ICT resources may have declined, but increasing their availability will not necessarily change the reading literacy outcomes

Conclusions

- **21st century online literacy reading skills** are crucial for modern day readers and the demands learners will face in higher education and the world of work

- South Africa faces **significant challenges** in terms of developing both paper-based and on-line reading skills

- Recommendation: **paper-based** reading should be strengthened by providing **resources (books)** and **creating a reading literacy environment.**

Conclusions

- Paper-based reading is **highly correlated** to online-reading, strengthen the former to develop the latter. Both should receive inputs in the school environment

- Learners who attend schools in **rural areas or township** and attend **African language schools** are the least likely to have access to both paper-based and ICT reading resources

- A strong focus on reading literacy achievement in the most **vulnerable populations** is essential for changing the current status

Conclusions

- The problems of implementing ePIRLS allude to the **lack of resources** and **inadequate monitoring** taking place in the SA education system

- ePIRLS highlighted the fact that **both** ICT and paper-based reading skills are not being taught to the most vulnerable populations

Conclusions

- While issues of **poverty**, **historical disadvantage** and **gender gaps** remain prevalent, the majority of SA learners will not have access to ICT resources or mastering paper-based reading skills

- The reading crisis is one of social justice that persists

Implications for the future…

- PIRLS 2021 is the **last cycle** which will have a paper-based option (same with PISA)
- An increased focus on digital literacy internationally, SA lags behind to our detriment and the disadvantage of our learners
- Serious changes are required if we want to compete in the global market

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Thank you

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