Arabic language teacher professional development

Hanada Taha Thomure[1], *Zai Arabic Research Center, Zayed University, Dubai, United Arab Emirates*

Gail Brown, *Designed Learning, Australia, gailbrown@designedlearning.com.au, ORCID:0000-0003-3082-6754*

Sandra Baroudi, *College of Interdisciplinary Studies, Zayed University, Dubai, United Arab Emirates, ORCID: 0000-0001-5130-6980*

Fatima AlMohsin, *Department of Education, Zayed University, Dubai, United Arab Emirates*

Rana Tamim, *CEO EduBridges*

---

[1] *Corresponding author: Hanada Taha Thomure, College of Education, Zayed University, Dubai, United Arab Emirates, P.O. Box: 19282, Hanada.Thomure@zu.ac.ae*

Abstract

High quality professional development programs and opportunities for teachers are a vital aspect in improving early student achievement. This study adopts a professional development model which tested the difference in early literacy skills and performance of students (n=2028) in Grades 1-3 over a 12-week teacher training program (n=25). The data were analyzed using ANOVA and indicated an overall significant improvement in all tested skills except for phonological awareness, such as rhyming word tasks and reading nonsense words, where there was a significant decrease in performance. The results also indicated a significant difference between gendered scores, where girls outperformed boys in all tested areas except vocabulary knowledge, where there was no statistical difference for Grade 1 and Grade 3 students. Informed by the data, this paper recommends greater teacher preparation in the areas of reading aloud, shared reading, phonics, and basic questioning techniques.

Keywords: professional development, Arabic language teachers, literacy instruction

Introduction

High quality professional development (HQPD) for in-service teachers is defined as sustained teacher PD that applies effective, evidence-based teaching strategies and curriculum to their classroom practices for maximizing student learning (Adger et al., 2004; Yoon et al., 2007; Darling-Hammond et al., 2017). HQPD has been heralded by many researchers as a valuable tool for quality literacy instruction (Darling-Hammond et al., 2005; Hattie, 2011; Taha-Thomure, 2019). Darling-Hammond et al. (2017) defined PD as a key factor in changing teacher practices to more effective ones that result in better student achievement. The field of early literacy stipulates that classroom teachers need solid grounding, knowledge, and expertise on how to implement best practices in the classroom including working at the word level and the text level through a focus on reading comprehension strategies (Snow & Griffin, 1998; Ukrainetz, 2009; National Reading Panel, 2000; National Early Literacy Panel, 2008; Porche et al., 2012; Basma & Savage, 2018). Those concepts have been consistently effective in supporting young readers' grasp of early reading skills especially when embedded within a strong literacy program that is focused on meaning, comprehension, and making connections across curricular content (Snow & Griffin, 1998; National Reading Panel, 2000; National Early Literacy Panel, 2008; Powell et al., 2010; Porche et al., 2012). This study aims to investigate the effect of content-focused PD on students' achievement in Arabic and proposes a

HQPD model that is focused on knowledge of teaching, knowledge of subject matter, and measuring student's achievement are at the center of HQPD.

Literature Review

Teachers in many countries around the world are required to be regularly engaged in continuous PD that is focused on content, that supports collaboration between teachers, and that provides them with opportunities for feedback, reflection and has direct relevance to what they do in the classroom (Holland, 2005; Birman et al., 2007; Darling-Hammond et al., 2017). Federal law in the United States, for example, mandates that teachers receive HQPD (National Reading Panel (US), 2000; Birman et al., 2007). In many parts of the US and Canada, about 5-10% and 6.5% of teachers' time respectively is spent in PD (Basma & Savage, 2018).

Despite impacting teacher development and learning processes, PD for teachers is mostly overlooked in the Arab world, and very few Arabic teachers have access to focused, effective, and sustained in-service PD (Taha-Thomure, 2017b). Accordingly, student scores on Arabic language standardized tests such as the Progress in International Reading Literacy Study (PIRLS) have consistently been below the international average in tests taken in 2021, 2016, 2011, and 2006 (Taha-Thomure, 2017b). Accordinlgy, initiatives have been introduced in the United Arab Emirates (UAE), where the current study was conducted, to advance children's academic achievement in Arabic

and ensure high quality teaching and learning in public education (Taha-Thomure, 2017a, 2017b, 2019).

What is HQPD?

"Successful programmes involve teachers in learning activities that are similar to ones they will use with their students, and encourage the development of teachers' learning communities" (OECD, 2009, p.3). The main goals of HQPD for teachers are to help them expand their skills, reflect on their knowledge, and change their attitudes so that they can support students to learn, understand, and apply concepts more effectively in their learning (Fennema et al., 1996; Desimone et al., 2002; Garet et al., 2008). It is therefore acknowledged that HQPD contributes to high quality instruction, which can impact student achievement (Fennema et al., 1996; Desimone et al., 2002) and strengthen teachers' skills in ways that are fluid, on-going, and diverse (Neuman & Cunningham, 2009; Koellner & Jacobs, 2015). With a plethora of PD modules and offerings advertised around the world to teachers, it becomes important to define what HQPD means. The No Child Left Behind Act (NCLB) (National Reading Panel (US) et al., 2000) proposed the following model for what is to be considered as high-quality PD:

(1) PD is sustained, intensive, and content-focused

(2) PD is aligned to the state or national content standards and assessments

(3) PD aims to improve and build teachers' content knowledge of subjects they teach

(4) PD helps teachers acquire understanding of proven to be effective teaching strategies and methodologies

(5) PD's effect on teaching practices and student achievement is regularly measured

Another PD model has been proposed by Darling-Hammond et al. (2017), which proposes that HQPD is one that incorporates: 1) focused content, 2) active learning, 3) collaboration, 4) usage of best practices, 5) coaching and support, 6) feedback and reflection and 7) sufficient duration.

Both the NCLB (2000) and Darling-Hammond (2017) models emphasize HQPD that is focused on sustained and relevant content, pedagogical knowledge where teachers are engaged and supported.

Desimone et al. (2002) proposed a minimum of 20 hours of teacher PD a year, while others advocated for much longer periods of study. In a report by Yoon et al. (2007) reviewing evidence on how teacher PD affects student achievement, it was concluded any study that looked at PD conducted for less than 14 hours per year showed no significant effect on student achievement (Yoon et al., 2007). Moreover, time allocated to teacher coaching inside classrooms may allow teachers to internalize the new practices learned and help them master the rationale and practices of the intervention introduced (Hindman & Wasik, 2012).

HQPD is usually designed based on a community of learning and group-based, active learning activities to consolidate communication, reflection, and critical thinking (Babinski et al., 2018). Meirink et al. (2010) suggest that engaging teachers in group and task-based activities during PD sessions develops their communication skills, understanding of new learning and supports them in providing better experiences to students. This is grounded in the experiential theory where according to Kolb (1984), effective learning tends to be a cycle of four stages, 1) learners acquire concrete knowledge, 2) learners observe and reflect on that learning experience, 3) learners form abstract concepts and conclusions, 4) learners test those conclusions and hypothesis and create new learning experiences based on that.

Research additionally suggests that PD for language teachers might be effective when it focuses on key conceptual literacy domains such as phonemic awareness, phonics, fluency, vocabulary, and text comprehension (National Reading Panel (US), 2000; Wasik & Bond, 2001; Cunningham et al., 2004; Wasik et al., 2006; Garet et al., 2008; Neuman & Dwyer, 2009; Wasik and Hindman, 2011; August & Shanahan, 2017; Taha et al., 2020), thus focusing on teacher knowledge and skills.

Teacher PD in the Arab Region

Several countries in the Arab world, including the UAE, have mandated that teachers in public schools should receive a certain number of hours, ranging from 30 hours in UAE to 90 in Bahrain, of MoE-run PD annually (Buckner et al., 2016). However, most PD

activities offered are far from being intensive, sustained, reflective, well-defined, or combined with in-class follow up and coaching (Gregory et al., 2021). A lack of access to quality teacher PD is a concerning issue that can be linked to unsatisfactory student achievement.

Current models of reading acquisition place strong emphasis on oral and aural language comprehension skills in the development of literacy in a child's first language (Wasik & Bond, 2001; Cunningham et al., 2004; Landry et al., 2006; Wasik et al., 2006; Jackson et al., 2007; Shanhan, 2021; Wasik & Hindman, 2011; Castles et al., 2018). Research on teaching early reading skills agrees that successful readers need to be taught to use an array of text features including phonological, orthographic, semantic, and syntactic ones (Invernizzi et al., 2004; Samuels, 2004; Ehri & Metsala, 2013; Al Ghanem & Kearns, 2015; Park et al., 2015; Taha & Taha, 2020; Taha-Thomure, 2019; 2023). A meta-analysis by Hansford et al. (2022) on the science of reading and writing instruction found strong evidence for instruction in phonemic awareness, morphology, phonics and vocabulary as initial requirements to reading fluency where children first work on the sounds of letters they are learning at the level of the phoneme.

Arabic language is a diglossic language (Ferguson, 1959; Ferguson, 1991; AlMousa, 2007; AlDanan, 2010; Obeid, 2010) that has many regional spoken varieties, and a higher-level written standardized variety (Ferguson, 1959). Spoken Arabic (SpA), and Modern Standard Arabic (MSA), are linguistically related despite the phonological and

syntactic distance between them (Gregory et al., 2021). The distance between the various SpAs and MSA can decrease or increase depending on how much MSA children are exposed to before they start formal schooling (Hassunah Arafat et al., 2017; Taha-Thomure et al., 2021). Frequent and early oral exposure to MSA through listening to stories, songs, watching cartoons, and other forms of oral exposure, are thought to be linked to gains in MSA knowledge and reading comprehension (Saiegh-Haddad et al., 2011; Abu-Rabia, 2000; Gregory et al., 2021; Taha-Thomure et al., 2021).

Arabic instruction in most schools is centered around specific textbook content that usually does not focus on early reading skills (Taha-Thomure, 2008; Faour, 2012; Tsimprea Maluch & Taha-Thomure, 2021). There is no clear vision in public schools regarding Arabic language early reading instruction in lower primary classrooms (Chekayri, 2018). Classroom talk is mostly dominated by teachers and may not ensure mastery of essential early reading skills (Faour, 2012; Gregory et al., 2021). The main activity during Arabic language classes are textbook activities and worksheets that are projected on a screen and students are asked to fill in the blanks or are asked one-by-one to repeat a certain words or sentences. Children are rarely engaged in daily and frequent read-alouds and are not regularly exposed to MSA (Taha-Thomure, 2008; Faour, 2012; Taha-Thomure et al., 2021; Gregory et al., 2021; Tsimpera Maluch, & Taha-Thomure, 2021). Currently, most schools provide Arabic language arts teachers with a textbook, and in some instances a projector or a smart board, in addition to PD content that is not

targeted or aligned to a national literacy plan or vision. There is no evidence currently that the impact of PD is being measured in public schools nor could the researchers find any evidence of measures of transfer or effectiveness being maintained and no evidence of in-class coaching being provided (Taha-Thomure, 2008; 2019; 2022).

This study aims to investigate the effect of content-focused PD on students' achievement in Arabic. The PD model adopted in this study is the revised NCLB (National Reading Panel (US) et al., 2000) model that might be more suited to the UAE public school system. The revised model focused on the main elements of the NCLB model as represented below (Figure 1) where knowledge of teaching, knowledge of subject matter, and measuring student's achievement are at the center of HQPD.

Figure 1.

The revised NCLB PD model
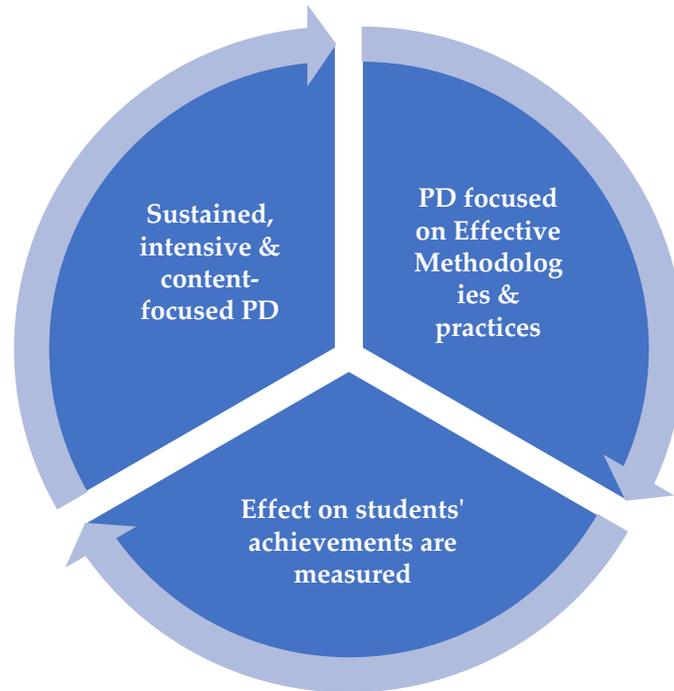
25 teachers from five public primary schools in the UAE were chosen by the Ministry of Education (MoE) to participate in a 12-week face to face PD in early reading. The first training included a 3-hour general overview of the study and an introduction to the test. Thereafter, participants received a 2.5-hour training session once a week on early literacy skills. During the PD sessions, researchers introduced one concept for about 45 minutes followed by practice between participants during the rest of the session. Almost all participant teachers said that it was the first time for them to be trained in early reading skills.

The current study aims to answer the following questions:

RQ1: Does content focused teacher PD lead to an increase in students' early reading skills scores?

RQ2: Is there a statistically significant difference in students' scores based on gender and grade level?

Materials and methods

Design

This is a mixed methods study combining elements of quantitative and qualitative research. A pre and posttest design was followed to measure the effect of the intervention on students' early reading skills. The results of the intervention are determined by comparing pre and posttest scores (Gay et al., 2009, p 253). To strengthen the validity of this design, the researcher applied the intervention over a period of 12 weeks and collected the pretest data as a baseline measurement prior to starting the intervention, and posttest data after the intervention concluded (Gay et al., 2009).

Intervention

A team of researchers designed a 12-week PD for Arabic language teachers in grades 1-3 in five public schools in the UAE. The aim was to train teachers on the best practices in Arabic early reading skills informed by the Science of Reading (SOR) (Taha-Thomure, 2023). PD sessions were content and pedagogy focused (see Table 1). PD sessions

incorporated active learning where teachers were asked to experiment and collaborate with their colleagues to model the skill learned. Trainings included task and group-based activities to stimulate teachers' cognitive skills and to allow for collaboration and support. Teachers were trained in how to design activities that target early reading skills to increase their abilities to work with students on alphabetic, phonemic, and phonological awareness.

The research team observed teachers' classrooms once before the intervention started and once after the intervention (Sailors & Price, 2010; Basma & Savage, 2018).

Table 1. PD sessions offered

Session 1	Study Overview
Session 2	Organizing the learning Environment & Use of MSA
Session 3	Phonological Awareness
Session 4	Phonemic Awareness, Alphabetic Principle
Session 5	Reading Aloud and Shared Reading
Session 6	Guided and Independent Reading
Session 7	Fluency and Running Records
Session 8	Vocabulary Acquisition
Session 9	Sight words
Session 10	Comprehension Strategies
Session 11	Giving Feedback
Session 12	Early Intervention

Participants (Teachers)

Twenty-five Arabic language teachers in grades 1-3 in five public primary schools in the UAE were chosen by the MoE to participate in the 12-week long intervention. The five schools and teachers did not sign up to be part of the intervention, but were rather

assigned to it by the MoE. There were two girls' schools and three boys' schools selected by the MoE. All 25 teachers have been teaching for at least three years, but have not received any targeted training in early reading skills during their pre-service preparation, nor in any of the in-service trainings they have had throughout their careers.

Participants (Students)

In total, 2028 (girls= 759, boys= 1269) Emirati students in Grade 1 through Grade 3 were recruited to the study. As per Table 2, all participating students completed The Mubakkir Arabic Early Reading Assessment prior to their Arabic teachers starting the PD sessions (pretest), and again after the PD intervention concluded, i.e., 12-weeks later (posttest). Data collected on students were limited to the pre and posttest results, grade level, and gender; no other student demographic information were shared with the researchers.

Table 2.

Numbers of student participants by gender and school

School	Boys (n=1269)	Girls (n=759)	Total (n=2028)
School 1 (girls)	0	368	368
School 2 (Boys)	277	0	277
School 3 (Girls)	0	391	391
School 4 (Boys)	394	0	394
School 5 (Boys)	598	0	598
Grade	Boys (n=1269)	Girls (n=759)	Total (n=2028)
1	288	269	557
2	445	249	694
3	536	241	777

Pre and posttest instrument

Mubakkir is a standardised, individually-administered test that is commercially available to determine how students in early years are performing on pre-literacy and early reading skills (Diglossia, 2016). Pre and posttest dates were assigned by the researchers for each school.

Students in each of the five participating schools were tested pre and post-intervetion on an individual basis by MoE specialists who were trained in using the tool. Researchers used a tablet to record students' responses and response time, while students identified sounds, rhymes, letters, blends, and read sight words and short texts using printed paper versions that were supplied by the research team (Table 3).

Table 3.

Early literacy skills tested per grade level

Literacy Skill	Test	Time	Grade 1	Grade 2	Grade 3
Alphabetic Awareness	Letter Naming Fluency	1 min.	✓	✓	✓
	Letter-Sound Fluency	1 min.	✓	✓	✓
Phonemic Awareness	Initial Sound Isolation	1 min.	✓	✓	✓
	Final Sound Isolation	1 min.	✓	✓	✓
	Phoneme Segmentation Fluency	1 min.	✓	✓	✓
	Nonsense Word	1 min.		✓	✓
Phonological Awareness	Syllable Detection	1 min.			✓
	Rhyming Recognition	1 min.			✓
	Rhyming Production	1 min.			✓
Vocabulary Knowledge	Word Use Fluency	1 min.			✓
Oral Reading Fluency	Sight Word Fluency	1 min.		✓	✓
	Oral Reading Fluency	1 min.			✓
Oral Reading Comprehension	Story Retell	1 min.			✓

Data Analysis

To answer the first two research questions, the Statistical Package for the Social Sciences (SPSS) version 22 was used for data analysis (George & Mallery , 2011). The normality of distribution of the students' scores was confirmed by calculating their skewness and kurtosis; values for asymmetry and kurtosis between -2 and +2 were considered acceptable to prove normal univariate distribution (George, 2011). The sample's characteristics were summarized using frequencies and percentages. Paired samples t-test was conducted to explore the impact of the intervention on students' scores in case of a normal distribution, whereas the Wilcoxon Non-Parametric Test (NPT) was used in case of a skewed distribution. Repeated measures Analysis of Variance (ANOVA) with a Greenhouse-Geisser correction was used to compare mean pre- and post-intervention scores between genders. Cohen's (1969) effect size (d) was calculated for significant associations; whereby d (absolute value) =|0.2|, d=|0.5|, and d=|0.8| were classified as small, moderate, and large effect sizes, respectively. A two-sided p<0.05 was considered significant.

Results

Pre and posttest results

The pre- and post-test results of assessed literacy skills are detailed in Table 4. Among Grade one students, following the intervention, there was a statistically significant small increase in mean alphabetic awareness from 114.23 to 144.30 (p<.001; d=0.386).

In Grade 2 students, the mean alphabetic awareness also slightly increased post-intervention from 52.59 to 61.78 (p<.001; d=0.223). Moreover, the average oral reading fluency total score slightly increased from 39.48 to 44.63 (p=0.028; d=0.084). However, mean phonemic awareness moderately decreased from 52.71 to 30.95 in post-intervention (p<.001; d=-0.607).

For Grade 3 students, following the intervention, most assessed literacy skills showed a statistically significant increase (alphabetic awareness, phonemic awareness, oral reading fluency, and oral reading comprehension), except for phonological awareness which presented a statistically significant decrease. The mean for alphabetic awareness slightly increased from 91.43 to 106.45 (p<.001; d=0.197). Also, mean phonemic awareness, oral reading fluency, and story retell moderately increased post-intervention from 33.75 to 77.86 (p<.001; d=0.520), from 50.84 to 91.47 (p<.001; d=0.520), and from 27.51 to 47.72 (p<.001; d=0.383), respectively. On the other hand, there was a large decrease in phonological awareness from 41.23 to 6.18 (p<.001; d=-1.20). Vocabulary knowledge was not affected by the intervention (p=0.884).

Table 4.

Pre- and post-test results of assessed literacy skills by grade level

Literacy Skill	Pre-test	Post-test	*P*	t(df)	Mean difference	95%CI	Effect size (d)
Grade 1							
Alphabetic Awareness	114.23 ± 72.47	144.30 ± 75.53	**<0.001**	9.11 (556)	30.07	23.58;36.55	0.386
Grade 2							
Alphabetic Awareness	52.59 ± 45.77	61.78 ± 46.42	**<0.001**	5.87 (693)	9.19	6.11;12.26	0.223
Phonemic Awareness	52.71 ± 47.50	30.95 ± 25.58	**<0.001**	-16.00 (693)	-21.76	-24.43;-19.09	-0.607
Oral Reading Fluency Total	39.48 ± 48.84	44.63 ± 46.39	**<0.001**	2.21 (693)	5.15	0.57;9.73	0.084
Grade 3							
Alphabetic Awareness	91.43 ± 90.80	106.45 ± 93.41	**<0.001**	5.48 (776)	15.02	9.65;20.40	0.197
Phonemic Awareness	33.75 ± 51.27	77.86 ± 79.61	**<0.001**	14.50 (776)	44.11	38.14;50.08	0.520
Phonological Awareness	41.23 ± 42.48	6.18 ± 8.47	**<0.001**	-24.89 (776)	-35.05	-37.81;-32.28	-1.20
Vocabulary Knowledge	2.98 ± 5.26	2.95 ± 4.80	0.884	-0.15 (776)	-0.03	-0.49;-0.42	-0.005
Oral Reading Fluency Total	50.84 ± 64.93	91.47 ± 88.71	**<0.001**	13.43 (776)	40.63	34.69;46.57	0.482
Oral Reading Comprehension (story retell)	27.51 ± 42.48	47.72 ± 50.16	**<0.001**	-10.67 (776)	20.20	16.49;23.92	0.383

Gender-based analysis (Table 5) revealed no significant differences in mean pre- and post-intervention scores of alphabetic awareness in Grade 1 and vocabulary knowledge in Grade 3. For all other literacy skills, significantly higher mean scores were reported among girls compared with boys (p<0.001).

In post-intervention, there was a significantly greater improvement in mean scores of alphabetic awareness among Grade 1 boys and oral reading comprehension among

Grade 3 boys compared with girls, respectively. Moreover, there was a significantly lesser deterioration in mean scores of phonemic awareness and oral reading fluency total among Grade 2 boys, and alphabetic awareness, phonological awareness, and vocabulary knowledge among Grade 3 boys compared with girls. No significant gender-based differences were noted in the mean difference of scores between pre- and post-intervention regarding alphabetic awareness in Grade 2, and phonemic awareness and oral reading fluency total in Grade 3.

Table 5.

Pre- and post-test results by gender and grade level.

Literacy Skill	Pre-test		Post-test		*P*	Mean difference		p-value	Effect size (d)	
	Boys	**Girls**	**Boys**	**Girls**		**Boys**	**Girls**		**Boys**	**Girls**
Grade 1										
Alphabetic Awareness	103.05 ± 72.57	126.21 ± 70.56	146.64 ± 71.91	141.80 ± 79.29	0.086	43.59 ± 71.10	15.58 ± 82.33	<0.001	0.61	0.19
Grade 2										
Alphabetic Awareness	38.24 ± 45.35	78.23 ± 33.80	50.71 ± 47.23	81.55 ± 37.62	**<0.001**	12.46 ± 42.13	3.32 ± 38.95	0.549*	0.30	0.09
Phonemic Awareness	39.54 ± 46.00	76.25 ± 40.61	24.37 ± 25.51	42.70 ± 21.16	**<0.001**	-15.16 ± 32.04	-33.54 ± 39.15	<0.001	0.47	0.86
Oral Reading Fluency Total	27.24 ± 42.21	61.36 ± 52.23	36.73 ± 45.22	58.76 ± 45.17	**<0.001**	9.48 ± 63.69	-2.59 ± 56.59	0.010	0.15	0.05

Grade 3										
Alphabetic Awareness	59.16 ± 84.11	163.20 ± 58.23	82.66 ± 93.64	159.37 ± 67.75	**<0.001**	23.50 ± 79.01	-3.83 ± 66.50	<0.001*	0.30	0.06
Phonemic Awareness	21.69 ± 45.23	60.57 ± 53.77	64.23 ± 73.92	108.16 ± 83.50	**<0.001**	42.54 ± 82.87	47.59 ± 88.95	0.266*	0.51	0.54
Phonological Awareness	29.23 ± 41.70	67.91 ± 30.36	4.51 ± 7.99	9.88 ± 8.36	**<0.001**	-24.71 ± 39.30	-58.02 ± 27.75	<0.001	0.63	2.09
Vocabulary Knowledge	1.83 ± 3.19	5.54 ± 7.57	2.49 ± 5.39	3.98 ± 2.88	0.081	0.65 ± 5.53	-1.56 ± 7.92	<0.001*	0.12	0.20
Oral Reading Fluency Total	28.10 ± 49.22	101.41 ± 67.15	71.44 ± 86.23	136.01 ± 77.32	**<0.001**	43.33 ± 87.65	34.60 ± 76.25	0.160	0.49	0.45
Oral Reading Comprehension (story retell)	9.64 ± 27.92	67.26 ± 42.40	34.58 ± 47.22	76.93 ± 43.85	**<0.001**	24.94 ± 50.96	9.67 ± 55.27	<0.001	0.49	0.17

*Mann-Whitney U NPT

Discussion

The purpose of this study was to examine the impact of PD on teacher practices and knowledge and students' early reading skills in Arabic language. The researchers developed and implemented a 12-week PD program and data was collected from 2028 students on the pre and posttest in early reading skills. Quantitative results from this study showed that the teacher PD implemented helped improve student scores in most literacy skills in all grade levels on the posttest in comparison with the pretest. There was

a statistically significant difference ($p < .05$) level in pre and posttest scores for all three grades included in this study except for phonological awareness skills, namely, rhyme recognition and rhyme production, which the students have never been exposed to in the MoE curriculum and which might have needed more training and practice time during the 12 week PD intervention. Researchers were informed that both those skills were not taught to students in any grade level as they were not part of the curriculum. Additionally, students in grade 2 had difficulty with phonemic awareness tasks (reading words and reading nonsense words), which might have been challenging for students given the absence of context when reading individual words and the absence of context and meaning when reading nonsense words (Cabell & Hwang, 2020; Taha-Thomure et al., 2021).
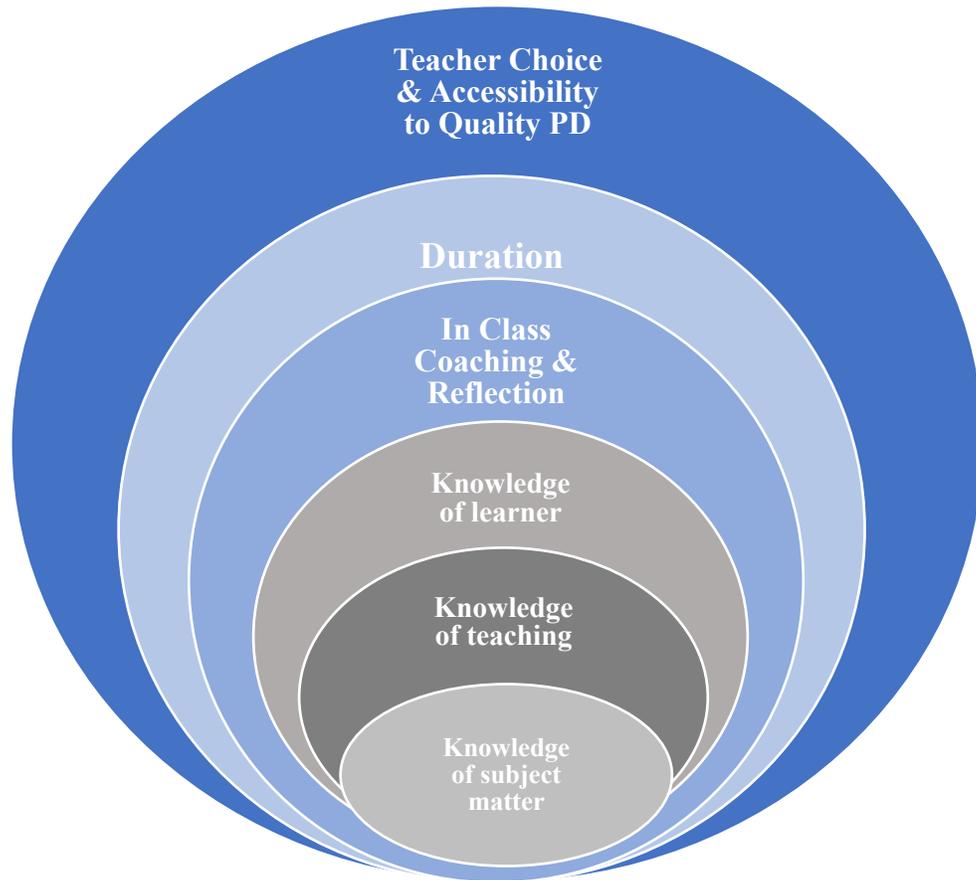
Results revealed that girls in grades 2 and 3 showed a significantly higher performance on the pre and posttest early reading skills than boys except in vocabulary knowledge in Grade 3. This gender gap is in alignment with the literature especially in the Middle East and North Africa region (MENA), reported as having the 2nd largest gender gap in learning in the world, with boys far more likely to perform below girls on literacy tasks (Gregory et al., 2021). This calls for a a special intervention in early reading skills for boys that probably has elements of engagement, high interest texts, targeted early reading skills and building of background knowledge (Gregory et al, 2021).

The length and duration of training is widely debated in the literature ranging from a minimum of 14 to 20 hours (Desimone et al., 2002; Basma & Savage, 2018) to much longer periods (Yoon et al., 2007). Furthermore, additional years of coaching (approximately 2 years) may allow teachers to internalise and integrate best practices into their teaching (Casey, 2006; Tanner-Smith & Kosanovich, 2008; Algozzine et al., 2009; Bailet et al., 2009; Frost et al., 2009; Hindman & Wasik, 2012). As such, we argue that the duration and intensity of the PD delivered in this study might not have been sufficient to ensure effective implementation and internalization of all literacy skills intended including the phonological awareness skills most students didn't do well on. However, we also argue that the immediate implementation of the knowledge gained led to the changes in teachers' practices and significant results obtained by the students on several of the measures tested (Baroudi, 2023).

In alignment with Basma and Savage (2018) and Baroudi's (2023) conclusions, we argue that the quality PD that factors in teacher choice and has enough rigor, systematization, and structured design will significantly impact teachers' knowledge and practices. The researchers are proposing a revised PD model for the UAE based on the findings of this study (Figure 2).

Figure 2.

A re-revisited model for teacher PD

Teacher Choice
& Accessibility
to Quality PD

Duration

In Class
Coaching &
Reflection

Knowledge
of learner

Knowledge
of teaching

Knowledge
of subject
matter

PD that is based on teacher choice in accessing quality PD, in-class coaching and

reflection, learner knowledge, pedagogical knowledge, and subject-matter content

knowledge, can be a partial good response to some improved student results.

Limitations

Limitations to this study stem from the fact that public schools and teachers participating did not elect to be in it. The power of choice can influence motivation levels when it comes to teacher training. Some teachers who participated in the study felt obliged to attend and their level of participation in the training sessions was accordingly affected (Baroudi, 2023). It is recommended to replicate this study with a group of self-chosen teachers and schools and compare the differences in student performance based on that. However, the question remains of how much teacher choice should be allowed in a system where teachers' preparation and instructional skills are lacking?

Another limitation stems from not being able to pilot the PD sessions before starting the intervention due to several administrative and gatekeeping contrsaints. It will be important to replicate the same study with a control group and time allowed to pilot the intervention before implementation starts.

Conclusion

The purpose of this study was to examine the impact of teacher PD on teacher practices and students' early reading skills in Arabic language. Twenty-five teachers from five public primary schools in the UAE were trained in early reading skills for 12 weeks. Those skills included phonemic, phonological, and morphological awareness skills, types of reading, classroom environment, fluency, vocabulary, comprehension strategies, early

intervention and giving students feedback. Pre and post test results on 2028 students in grades 1-3 were analyzed and the posttest results showed a significant difference across all grade levels in all five schools.

Results obtained in this study emphasize the importance of sustained, and content and pedagogically-focused teacher PD. Although the results were encouraging, however, the lack of transfer of some of the early reading skills introduced such as rhyme detection and production might reflect the need for longer and more sustained PDs. Also, this study highlighted the importance of having access to quality PDs, teacher choice, and frequent classroom coaching and reflection exercises that can scaffold the skills teachers need to practice and reflect on. It would be important to revisit the PD model used in this study and adjust towards what Figure 2 above depicts. Quality and HQ PD are the result of intensive and laser-focused work that needs to be intentional, sustained, and accessible.

Acknowledgements

authors, additionally, wish to thank Zayed University for the funding of this research

(Cluster Grant R21106)

Declaration of interest statement

The authors report there are no competing interests to declare.

References

Abu-Rabia, S. (2000). Effects of exposure to literary Arabic on reading comprehension in a diglossic situation. *Reading & Writing, 13*(1), 147–157.

Adger, C. T., Hoyle, S. M., & Dickinson, D. K. (2004). Locating learning in in-service education for preschool teachers. *American Educational Research Journal, 41*(4), 867–900.

Al Ghanem, R., & Kearns, D. M. (2015). Orthographic, phonological, and morphological skills and children's word reading in Arabic: A literature review. *Reading Research Quarterly, 50*(1), 83–109.

AlDanan, A. (2010). *The theory of teaching MSA through natural practice: Application, assessment and dissemination*. AlBasha'er Publishing House.

Algozzine, B., Marr, M. B., Kavel, R. L., & Dugan, K. K. (2009). Using peer coaches to build oral reading fluency. *Journal of Education for Students Placed at Risk, 14*(3), 256–270.

AlMousa, N. (2007). *Arabic language in the modern era: Constant values and changing values*. AlShurouq Publishing House.

August, D. & Shanahan, T. (2017). *Developing literacy in second-language learners: Report of the National Literacy Panel on language-minority children and youth*. Routledge.

Babinski, L. M., Amendum, S. J., Knotek, S. E., Sánchez, M., & Malone, P. (2018). Improving young English learners' language and literacy skills through teacher

professional development: A randomized controlled trial. *American Educational Research Journal, 55*(1), 117–143.

Bailet, L. L., Repper, K. K., Piasta, S. B., & Murphy, S. P. (2009). Emergent literacy intervention for prekindergarteners at risk for reading failure. *Journal of Learning Disabilities, 42*(4), 336–355.

Baroudi, S. (2023). Exploring teacher education for sustainable development in the UAE. *Sustainability, 15*(3), 1981.

Basma, B. & Savage, R. (2018). Teacher professional development and student literacy growth: A systematic review and meta-analysis. *Educational Psychology Review, 30*(2), 457–481.

Birman, B., Le Floch, K., Klekotka, A., Ludwig, M., Taylor, J., Walters, K., & O'Day, J. (2007). *Evaluating teacher quality under No Child Left Behind*. RAND Corporation.

Buckner, E., Chedda, S., & Kindreich, J. (2016). Teacher professional development in the UAE: What do teachers actually want? *Sheikh Saud Bin Saqr Al Qasimi Foundation for Policy Research, 16*, 1-12.

Cabell, S.Q. & Hwang, H. (2020). Building content knowledge to boost comprehension in the primary grades. *Reading Research Quarterly, 55*, S99–S107.

Castles, A., Rastle, K., & Nation, K. (2018). Ending the reading wars: Reading acquisition from novice to expert. *Psychological Science in the Public Interest*, *19*(1), 5–51. https://doi.org/10.1177/1529100618772271

Casey, K. (2006). *Literacy coaching: The essentials*. Heinemann.

Chekayri, A. (2018). L'enseignement en arabe dialectal pour consolider l'acquisition de l'arabe standard. In : Chekayri A and Mgharfaoui K (Eds.) *Réflexion Sur Le Lexique et l'enseignement de l'arabe Marocain.* (pp. 13-51). Centre de La Promotion Du Darija.

Cohen, J. (1969). *Statistical power analysis for the behavioral sciences*. Academic Press.

Cunningham, A. E., Perry, K. E., Stanovich, K. E., & Stanovich, P. J. (2004). Disciplinary knowledge of K-3 teachers and their knowledge calibration in the domain of early literacy. *Annals of Dyslexia, 54*(1), 139–167.

Darling-Hammond, L., Bransford, J., LePage, P., & Duffy, H. (2005). *Preparing teachers for a changing world: What teachers should learn and be able to do*. Jossey-Bass.

Darling-Hammond, L., Hyler, M.E., & Gardner, M. (2017). *Effective teacher professional development*. Learning Policy Institute.

Desimone, L. M., Porter, A. C., Garet, M. S., Yoon, K. S., & Birman, B. F. (2002). Effects of professional development on teachers' instruction: Results from a three-year longitudinal study. *Educational Evaluation and Policy Analysis, 24*(2), 81–112.

Diglossia. (2016). *Mubakkir test*. http://diglossia.net/

Ehri, L. C. & Metsala, J. (2013). Grapheme–phoneme knowledge is essential for learning to read words in English. In: Metsala J and Ehri LC (Ed.) *Word Recognition in Beginning Literacy*. (pp. 3-41). Routledge.

Faour, M. (2012). *The Arab World's education report card: School climate and citizenship skills.* Carnegie Endowment for International Peace. https://carnegieendowment.org/files/school_climate.pdf

Fennema, E., Carpenter, T.P., Franke, M.L., Levi, L., Jacobs, V.R., & Empson, S.B. (1996). A longitudinal study of learning to use children's thinking in mathematics instruction. *Journal for Research in Mathematics Education, 27*(4): 403–434.

Ferguson, C. A. (1959). Diglossia. *Word, 15*(2), 325–340.

Ferguson, R. F. (1991). Paying for public education: New evidence on how and why money matters. *Harvard Journal on Legislation, 28*, 465-498.

Frost, S., Buhle, R., & Blachowicz, C. L. (2009). *Effective Literacy Coaching: Building Expertise and a Culture of Literacy*. Association for Supervision and Curriculum Development.

Garet, M. S., Cronen, S., Eaton, M., Kurki, A., Ludwig, M., Jones, W., Uekawa, K., Falk, A., Bloom, H. S., & Doolittle, F. (2008). *The impact of two professional development interventions on early reading instruction and achievement*. National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. https://ies.ed.gov/ncee/pdf/20084030.pdf

Gay, L. R., Mills, G. E., & Airasian, P. W. (2009). *Educational Research Competencies for Analysis and Applications*. Pearson.

George, D. & Mallery, P. (2011). *SPSS for windows step by step: A simple study guide and reference, 17.0 update.* Pearson Education India.

Gregory, L., Taha Thomure, H., Kazem, A., Elsayed, M. A. A., & Taibah, N. (2021). *Advancing Arabic language teaching and learning: A path to reducing learning poverty in the MENA.* The World Bank.

Hansford, N., Garforth, K., & King, J. (2022). *A road map to evidence based instruction in reading and writing education: A secondary meta-analysis on the science of reading & writing instruction.* Teaching by Science. https://www.teachingbyscience.com/sor-recommendations

Hassunah Arafat, S., Korat, O., Aram, D., & Saiegh-Haddad, E. (2017). Continuity in literacy achievements from kindergarten to first grade: A longitudinal study of Arabic-speaking children. *Reading & Writing, 30*(5), 989–1007.

Hattie, J. (2011). *Visible Learning for Teachers*. Routledge.

Hindman, A. H. & Wasik, B. A. (2012). Unpacking an effective language and literacy coaching intervention in head start: Following teachers' learning over two years of training. *The Elementary School Journal, 113*(1), 131–154.

Holland, H. (2005). Teaching teachers: Professional development to improve student achievement. *American Educational Research Association (AERA), 3*(1), 1-4.

Invernizzi, M., Sullivan, A., Meier, A. J., & Swank, L. (2004). The development of PALS-PreK. In: *PreK Teacher's Manual. Phonological Awarness Literacy Screening (PALS).* (pp. 47-69). The Virginia Department of Education University of Virginia. Curry School of Education.

Jackson, R., McCoy, A., Pistorino, C., Wilkinson, A., Burghardt, J., Clark, M., Ross, C., Schochet, P., & Swank, P. (2007). *National evaluation of early reading first.* Institute of Education Sciences, U.S. Department of Education. https://ies.ed.gov/ncee/pubs/20074007/pdf/20074007.pdf

Kolb, D. A., & Fry, R. (1975). Toward an applied theory of experiential learning. In C. Cooper (Ed.), *Studies of group process* (pp. 33–57). New York: Wiley.

Koellner, K. & Jacobs, J. (2015). Distinguishing models of professional development: The case of an adaptive model's impact on teachers' knowledge, instruction, and student achievement. *Journal of Teacher Education, 66*(1), 51–67.

Landry, S. H., Swank, P. R., Smith, K. E., Assel, M. A., & Gunnewig, S. B. (2006). Enhancing early literacy skills for preschool children: Bringing a professional development model to scale. *Journal of Learning Disabilities, 39*(4), 306–324.

Meirink, J. A., Imants, J., Meijer, P. C., & Verloop, N. (2010). Teacher learning and collaboration in innovative teams. *Cambridge Journal of Education, 40*(2), 161–181.

National Early Literacy Panel. (2008). *Developing early literacy: Report of the National Early Literacy Panel*. Report for the National Institute for Literacy.

National Reading Panel (2000). *Report of the National Reading Panel: Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction: Reports of the subgroups*. National Institute of Child Health and Human Development, National Institutes of Health. https://www.nichd.nih.gov/sites/default/files/publications/pubs/nrp/Documents/report.pdf

Neuman, S.B. & Cunningham, L. (2009). The impact of professional development and coaching on early language and literacy instructional practices. *American Educational Research Journal, 46*(2), 532–566.

Neuman, S.B. & Dwyer, J. (2009). Missing in action: Vocabulary instruction in pre-K. *The Reading Teacher, 62*(5), 384–392.

Obeid, A. (2010). *Reasons for the low performance in the teaching of Arabic language.* Arab Organization for Education, Culture and Science.

OCED. (2009). *Creating effective teaching and learning environments: First results from TALIS.* https://www.oecd.org/education/school/43023606.pdf

Park, Y., Chaparro, E. A., Preciado, J., & Cummings, K. D. (2015). Is earlier better? Mastery of reading fluency in early schooling. *Early Education and Development, 26*(8), 1187–1209.

Porche, M. V., Pallante, D. H., & Snow, C. E. (2012). Professional development for reading achievement: Results from the Collaborative Language and Literacy Instruction Project (CLLIP). *The Elementary School Journal, 112*(4), 649–671.

Powell, D. R., Diamond, K. E., Burchinal, M. R., & Koehler, M. J. (2010). Effects of an early literacy professional development intervention on head start teachers and children. *Journal of Educational Psychology, 102*(2), 299–312.

Saiegh-Haddad, E., Levin, I., Hende, N., & Ziv, M. (2011). The linguistic affiliation constraint and phoneme recognition in diglossic Arabic. *Journal of Child Language, 38*(2), 297–315.

Sailors, M. & Price, L.R. (2010). Professional development that supports the teaching of cognitive reading strategy instruction. *The Elementary School Journal, 110*(3), 301–322.

Samuels, M. (2004). The illustrated history book: History between word and image. In: V. R. Schwartz & J. M. Przyblyski (Eds.) *The Nineteenth-Century Visual Culture Reader*. (pp. 238-249). Routledge.

Snow, C. E. & Griffin, P. (1998). Preventing reading difficulties in young children. In: National Research Council (Eds.), *Early Childhood Development and Learning: New Knowledge for Policy*. (pp. 43-56). The National Academies Press.

Taha-Thomure, H. (2008). The status of Arabic language teaching today. *Education, Business, and Society: Contemporary Middle Eastern Issues, 1*(3), 186-192.

Taha-Thomure, H. (2017a). *Arabic Language Arts Standards and Performance Indicators.* Educational Book House Publishing.

Taha-Thomure, H. (2017b). Arabic language teacher education. In: A. Gebril (Eds), *Applied Linguistics in the Middle East and North Africa.* (pp. 267-287). John Benjamins Publishing Company.

Taha-Thomure, H. (2019). Arabic language education in the UAE: Choosing the right drivers. In: K. Gallagher K (Eds.), *Education in the United Arab Emirates.* (pp. 75-93). Springer.

Taha-Thomure, H. (2022). Linguistic effects of the nanny culture on Gulf identities. In:S. Hopkyns & W. Zoghbor (Eds.) *Linguistic Identities in the Arab Gulf States: Waves of Change.* (pp. 52-66). Routledge.

Taha-Thomure, H. (2023). What brain imaging research and science of reading can do for Arabic language teaching & learning? In I. Saleh & M. Swe-Khine (Eds), *New science of learning: Exploration in mind, brain, and education* (pp. 20-39). Brill Publishing. DOI: https://doi.org/10.1163/9789004540767_003.

Taha, H. & Taha, H. (2020). Morpho-orthographic preferences among typical poor native Arab readers. *Writing Systems Research, 11*(2), 212-225.

Taha Thomure, H., Tamim, R. M., & Griffiths, M. (2021). *A Report on the effect of Arabic language diglossia on teaching and learning.* Zayed University.

Tanner-Smith, T. & Kosanovich, M. (2008). *Leading for Reading: An Introductory Guide for K–3 Reading Coaches Participant's Guide.* RMC Research Corporation, Center on Instruction.

Tsimprea Maluch, J. & Taha-Thomure, H. (2021). Shifting paradigms in Arabic pedagogy and policy in the UAE: Opportunities and challenges for teacher education. In N. Bakkaliand & N. Memon N. (Eds.) *Teacher Training and Education in the GCC: Unpacking the Complexities and Challenges of Internationalizing Educational Contexts.* Rowan & Littlefield.

Ukrainetz, T.A. (2009). Phonemic awareness: How much is enough within a changing picture of reading instruction? *Topics in Language Disorders, 29*(4), 344–359.

Wasik, B. A. & Bond, M. A. (2001). Beyond the pages of a book: Interactive book reading and language development in preschool classrooms. *Journal of Educational Psychology, 93*(2), 243–250.

Wasik, B. A. & Hindman, A. H. (2011). Improving vocabulary and pre-literacy skills of at-risk preschoolers through teacher professional development. *Journal of Educational Psychology, 103*(2), 455–469.

Wasik, B. A., Bond, M. A. & Hindman, A. (2006). The effects of a language and literacy intervention on Head Start children and teachers. *Journal of Educational Psychology, 98*(1), 63–74.

Yoon, K. S., Duncan, T., Lee, S. W-Y., Scarloss, B., & Shapley, K. L. (2007). *Reviewing the Evidence on How Teacher Professional Development Affects Student Achievement*. U.S. Department of Education, Institute of Education Sciences, Regional Educational Laboratory Southwest.