

The PISA performance gap between national and expatriate students in the United Arab Emirates

Journal of Research in
International Education
2023, Vol. 22(2) 22–45
© The Author(s) 2023
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/14752409221090440
<https://www.jrie.org>


Jose Marquez

University of Manchester, UK

Louise Lambert 

Canadian University Dubai, Dubai, UAE

Natasha Y Ridge 

Sheikh Saud bin Saqr Al Qasimi Foundation for Policy Research, Ras Al Khaimah, UAE

Stuart Walker

RDFZ Kings College School Hangzhou, China

Abstract

In most education systems, students with an immigrant background perform worse academically than do native students. However, in the United Arab Emirates (UAE) differences emerge in the opposite direction and the national-expatriate gap in academic performance is equivalent to almost three years of schooling. This gap is a concern in the UAE, where national students mainly attend public schools while expatriates mostly attend private schools. In this study, to investigate the performance gap between national and expatriate students we estimate group differences and conduct linear regression analysis using data from the 2018 *Programme for International Student Assessment*. Results show that the gap varies by emirate and country of origin, and is greater among boys, better-off students and those attending private schools. Between 33% and 47% of this gap is explained by school type, whether public or private. We offer recommendations for the UAE that may also be useful for other high expatriate recruiting nations in development; however, in a country characterized by 85% expatriates and a maturing education policy, challenges remain.

Keywords

PISA, United Arab Emirates, private/public schools, gender, education, expatriates, education policy

Corresponding author:

Jose Marquez, Manchester Institute of Education, University of Manchester, Oxford Road, Manchester, M13 9PL, UK.
Email: jose.marquez@manchester.ac.uk

Background

There is much research stemming from the *Programme for International Student Assessment* (PISA) study by the Organization for Economic Cooperation and Development (OECD). This research has implications for national education policy, although its use is not without critique (Hopfenbeck et al, 2018; Rautalin et al, 2019; Singer and Brown, 2018). Multiple studies have examined differences in academic outcomes between native students and students with immigrant backgrounds (see, for instance, Ammermüller, 2005; Cattaneo and Wolter, 2015; Hippe and Jakubowski, 2018; O'Grady et al, 2019), generally showing that immigrant children's academic performance tends to be poorer in comparison to that of native-born children. Several variables serve as explanations. When household language differs from that of the host country and unfamiliarity with classroom assessment methods is experienced, a negative relationship with achievement scores is observed (Cathles et al, 2018). This is also true when family lack of interest and lack of involvement is high (Woessmann, 2016).

Yet this is not found in the United Arab Emirates (UAE), a country consisting of seven emirates that is just over 50 years old, and where differences in academic performance between national and expatriate students operate in the opposite direction: nationals underperform relative to expatriates (OECD, 2018a). The UAE, a small country of 10 million, is host to approximately 9 million expatriates and home to over 600 private schools, a rate only recently surpassed by China (Kamal and Trines, 2018). Similar differences in academic performance between citizens and expatriates have been observed in Qatar and Saudi Arabia, as well as in Thailand and Macau-China (OECD, 2018a). Established immigrant-receiving countries, or those with guest worker agreements, tend to welcome highly qualified parents with a positive effect on children's attainment (Cattaneo and Wolter, 2015; Dustmann et al, 2012; Levels et al, 2008). At the same time, nations sending immigrant groups which have high socioeconomic capital and are politically stable contribute to children performing academically better in their new host countries.

Differences between public and private schools are another area of inquiry, with studies showing the latter tend to outperform public schools (see DeAngelis, 2018; Donkers and Robert, 2008; OECD, 2011a). Still, Sakellariou (2017) evaluated PISA's 2012 mathematics scores from 40 nations, showing a private school advantage for a few, but an overall equal performance between school types. The advantage is explained by school selection of higher performing and more privileged students, with less able students opting more often for public schools (see Mahuteau and Mavromaras, 2014; Pfeffermann and Landsman, 2011). Delprato and Chudgar (2018) also showed the gap could be explained by competition, accountability and staffing policies, yet these made a bigger difference for high performing students only. The private school advantage may exist relative only to the quality of public schools, or be accounted for by non-academic variables (such as socioeconomic inequality, administrative autonomy, and overall literacy rates).

While the UAE conforms to the general pattern of private schools performing better relative to public schools, it remains an outlier for its reverse immigrant gap in academic performance. A clearer understanding of this gap could be helpful for UAE policymakers. Currently, the nation's public sector accounts for 20% of the public purse and is where the majority of Emirati nationals are employed; in parallel, the private sector more often employs expatriates, given a perceived skills shortage in the national population. It has been a concern that public school reforms are not attaining the employment goals needed for greater nationalization of the private sector (Alsahi, 2020; Ashour, 2020). Reforms will have important effects as the nation also diversifies and pivots from a dependence on natural resources towards intellectual capital responsible for a large share of economic growth (Amirat and Zaidi, 2020; Lange et al, 2018). Accordingly, this article explores the degree to which this gap exists in the UAE using data from the 2018 PISA study, and the

contributors to it. Our findings are also relevant for nations where the proportion of expatriate students is substantial and the education system also evolving.

UAE Educational Context

The public education model in the UAE has experienced many changes (Ridge et al, 2017). In the 1950s, curricula were imported from Bahrain, Kuwait and Saudi Arabia, with the Egyptian model being used from the 1970s to late 1980s. The UAE National Curriculum emerged in 1985, while a new English language curriculum was implemented in the 1990s. In 2007, *Madares Al Ghad* (Schools of Tomorrow) was implemented, with a bilingual Arabic/English and science emphasis adopted in later years. In 2016, it was replaced with a focus on giftedness, 21st century skills and career guidance.

In Abu Dhabi, one of the seven emirates, the Abu Dhabi School Model was also implemented from 2010 to 2018, focusing on deeper learning, outcomes-based curriculum, technology-rich environments, and bilingualism. Yet it appeared that school principals lacked implementation skills, and a focus on team-teaching was made difficult due to the lack of communication, collaboration and consistency of teaching methods between English and Arabic teachers (Al-Fadala, 2015). A lack of qualified local teachers which necessitated expatriate teachers taking a larger role, and pressure to generate quick results, further hampered success.

The UAE government has implemented additional reforms (Government of the United Arab Emirates, 2018) comprising the 2017-2021 national education strategy, which aimed to build a competitive knowledge society that meets present and future labour market needs. It has implemented a licensing examination to standardize teacher qualifications, with the Ministry conducting school inspections in public and private schools located in the Northern Emirates and public schools in Dubai (also an emirate) while, since 2008, the Knowledge and Human Development Authority (KHDA) inspects Dubai's private schools, and the Abu Dhabi Education Council (ADEC) inspects public and private schools there (Al-Fadala, 2015). In Dubai, the KHDA stopped inspecting public schools in 2010, although a 2016 Cabinet decision re-established this function, with inspections re-starting in 2019 in response to unimpressive PISA 2018 results.

Again in 2021 and to commemorate its 50th anniversary, the Ministry of Education (www.moe.gov.ae) published its *UAE Centennial 2071* plans for education which include, among many goals, to merge the Ministry of Education and Ministry of Higher Education into one that is 'responsible for educational planning and managing from the early childhood stage until the completion of all levels, in order to unify efforts and policies, rationalize the financial and human resources, and bridge the gap between the output of general and higher education and the labor market needs.' It also plans the development of a 'national school framework with international standard specifications, called the "Emirati school" to be generalized at the country level', a model which also relies on smart technology for continuous student assessment and evaluation.

Relevance of PISA at home and beyond

PISA scores are released every three years. The OECD's global assessment focuses on 15-year-old students' performance in three core subjects: mathematics, science, and reading. Offered in over 100 languages and overseen by national and international experts, scores provide a snapshot for education stakeholders of how well education systems are performing. PISA's aim is to assess preparedness for adult life. Background surveys regarding demographic information and attitudes towards learning and wellbeing are also included, as well as class size, organizational structures and frequency of national assessments.

PISA results have been used to shape global education reforms (Hopfenbeck et al, 2018; Rautalin et al, 2019; Singer and Brown, 2018; Zhao, 2016). In the UAE, the National Agenda targets were revised to include a national PISA ranking of 20th position by 2021. To pass KHDA inspections, private schools must report on how curriculum was expressly modified to meet PISA targets. More recently, the *UAE Centennial 2071* plan specified for its mathematics curriculum: ‘The time distribution of all curriculum in 4 streams has been rescheduled to ensure that the required standards of international tests are covered, especially TIMSS and PISA. All TIMSS questions for grades 4 and 8 . . . have been classified according to the curriculum learning results, in addition to training teachers how to utilise them inside the classroom. Practice questions are regularly published on [learning management systems] LMS system to ensure the continuous preparation of the students’ (www.moe.gov.ae).

As priorities shift to achieving better rankings (Sjøberg, 2015), critics charge that reforms have produced more standardization, converging global education policy and narrow curriculum tailored to PISA’s learning outcomes (Araujo et al, 2017; Fuller and Stevenson, 2019; Rautalin et al, 2019). While legitimizing reform (Hopfenbeck et al, 2018), using high-scoring nations as the template for success, particularly when intangibles such as student motivation, parental attitudes towards education and cultural values account for many differences, remains problematic (Singer and Brown, 2018).

Still, education policies influence achievement. Scholars find, for example, that higher scores are correlated with economic growth, decreasing unemployment and rising GDP, as well as higher education and wages (Hanushek and Woessmann, 2008; Lee and Newhouse, 2013; OECD, 2010; Sørensen and Krassel, 2019). A study (Gibson et al, 2019) using 2000 PISA scores and tax data shows that reading proficiency is also correlated with higher earnings in the years after leaving school. Others show direct links between wages and literacy, numeracy and ICT skills (Campos-Vazquez, 2018; Edin et al, 2017; Hanushek et al, 2015) and indirect links with higher education and vocational training (Bussièrè et al, 2009; Ostrovsky and Frenette, 2014; Zhao et al, 2017). Going beyond, education also drives positive outcomes for health, wellbeing, and civic participation (Hahn and Truman, 2015; Oreopoulos and Salvanes, 2011; Witschge et al, 2019; Yakovlev and Leguizamon, 2012).

Academic outcomes in the UAE

The UAE in PISA. In the Middle East/North Africa (MENA) region, PISA scores are below the world average and below what is expected for the level of terminal academic qualifications achieved by students; in the UAE, they are also below what is expected for nations with similar GDPs (Burton, 2017; World Economic Forum, 2017). The UAE first participated in PISA in 2009. Since then, results in reading, mathematics and science have remained stable, ranging between 430 and 440 points, but below those observed across all OECD countries (around 490 points). Only in mathematics was a modest improvement observed in 2018 relative to 2009 (OECD, 2019). The lack of variation in performance scores is typical across many countries as few manage to attain substantial or sustained improvements over time (Crawford et al, 2019). There are differences within scores as well, with females outperforming males in all MENA nations and being more likely to finish high school and undertake higher education (Ridge, 2017). Contributing factors include the quality of public and private schools (Azzam, 2017), as well as differences between socioeconomic classes (Buckner, 2018), and between expatriate and national students and teachers (Buckner, 2017).

Gender gap. Results from PISA 2018 indicate that across OECD countries, on average, girls do better than boys in reading (30 points), slightly worse in mathematics (-5 points) and marginally

better in science (2 points). Yet, in the UAE (as well as Qatar and Saudi Arabia), girls outperform boys in all three areas and this gap is larger than any observed elsewhere. Compared to boys, girls in the UAE perform better in reading (57 points, the second largest gap observed across 79 countries), mathematics (9 points) and science (26 points) (OECD, 2019: 4), with the female advantage being observed in 2012 and 2015 as well.

More broadly, males are under-represented in higher education, and in all fields of study except engineering, business and law (Abdulla and Ridge, 2011), with 80% of students at the largest public university being female. Much of the absence of males is explained by an ability to gain employment without a degree (eg in the police, military, and public sector). The labour market pull has made their need for education less salient.

Further fuelling the gap is the fact that nearly 100% of public school primary teachers are national Emirati females, the proportion dropping to half by secondary school. Thereafter, schools are staffed by male expatriate teachers, 80% of whom come from Egypt, Syria, and Jordan (Dave et al, 2016; Ridge et al, 2017): a situation not uncommon in the UAE as nearly 90% of its population comprises expatriates (World Bank, 2016). In public schools, female national teachers teach female national students while expatriate male teachers teach male national students until grade 6. Interestingly, despite Emirati female English language teachers having less experience, having lower TOEFL scores and being younger than their expatriate counterparts, they produce higher achievement scores with their students (Dave et al, 2016).

Some attribute the gap to expatriate teachers having fewer employment benefits, promotion opportunities and lower salaries, with annual contracts being the norm, while national teachers have higher salaries, development opportunities and tenure (Agwa and Salem, 2015; Ridge et al, 2014). Some expatriate teachers, hailing from nations with little pedagogical training and low teaching standards, also engage in private tutoring for extra income, lowering the quality of their daytime teaching (Ridge et al, 2014; Rocha and Hamed, 2018). Such conditions may contribute to low wellbeing in teachers, which fuels presenteeism, difficult student rapport, and poor academic outcomes particularly with male national students, who report engaging in more private tutoring (Harding et al, 2019; Rocha and Hamed, 2018). A lack of same nationality role models does little to help (Ridge et al, 2017).

Socioeconomic status gap. Socioeconomic inequalities exist in the UAE (Buckner, 2017; OECD, 2016) and results from PISA 2018 suggest that the influence of socioeconomic status on academic performance is stronger than in most nations. For example, socioeconomically advantaged students outperformed disadvantaged students in reading by 105 points in the UAE (89 points across OECD countries). Similarly, 7% of disadvantaged students scored in the top quarter of reading performance within the UAE, compared with 11% across OECD countries (OECD, 2019).

Wealth is unequally distributed (Alvaredo et al, 2019), with 11% of the population found in the lowest income quintile and another 12% in the next highest. Buckner's (2018) study shows that this gap is larger than that for gender. In her study, low-income national students in the UAE performed worse on the 2015 PISA assessment than did middle and higher income nationals. Performance rose with wealth, although at the highest income level it added little, while at the lowest it rose sharply. The benefits of private schools were also notable, but more so for low-income nationals, who did better in private schools than higher income nationals (35-40 additional points versus 10-20). Conversely, low-income nationals did worse in public schools, reporting feeling ostracized by others. Buckner added that while parent support for education was high in the UAE, interest in children's activities was correspondingly low (49th of 55 nations).

School type gap. The school type gap in academic performance is pronounced (OECD, 2011a; Sakellariou, 2017). In the UAE, public schools are attended only by nationals and Arab students whose parents work in federal institutions, while private schools have been seen as being for expatriate children, though increasingly seen as an alternative for national students, with numbers in them almost doubling from 2014 to 2018 (see Kamal and Trines, 2018; Ridge et al, 2015).

The range of quality in private schools is broad, with at least 17 curriculum options, and their fees vary just as much, with some reaching as high as 35% of family income (Ridge et al, 2015; Warner and Burton, 2018). In Dubai, the KHDA ranks schools and allows fee increases relative to inspection results. Azzam (2017) reports that ‘Outstanding’ private schools in Dubai demand 50% higher fees than those scoring ‘Good’, which demand twice the fees of those scoring ‘Acceptable’. Schools offering a UK or American curriculum are more likely to fall into ‘Outstanding’ or ‘Good’ categories than are those using the national curriculum, only 15% of which are classified as ‘Good’ and none as ‘Outstanding’. In the 2018 PISA tests, schools offering the International Baccalaureate (IB) curriculum recorded the highest scores followed by those offering UK, Indian and US curricula (KHDA, 2018).

The fact that a direct correlation exists between fees charged and KHDA rankings (Ridge et al, 2016) exacerbates the socioeconomic gap, with many questioning the degree to which fee increases are justified. El-Sholkamyl and Al-Saleh’s (2017) cost-benefit analysis showed that KHDA’s ‘Good’ schools produced a higher return on fee investment (ROI of 2.34) relative to lifetime earnings than ‘Very Good’ (ROI: 1.98) and ‘Outstanding’ schools (ROI: 1.75). They argue that rankings should not come at the expense of better learning outcomes they were designed to produce and to which regulators and schools are held accountable. The ranking structure inflates fees that are unaligned with PISA scores, creates a false confidence in the quality of education and potentially incentivizes schools to improve amenities over performance.

There are also public school peculiarities. Low satisfaction among Emirati teachers is high compared to expatriate teachers; their satisfaction is driven by perceptions of status and pay relative to other nationals (Buckner, 2017). They report feeling the profession is undervalued and garners little respect relative to the fields of business, medicine, or the public sector, all of which pay more. Conversely, private school teachers are more satisfied, generally working for prestigious, better-established and higher-performing schools; even they perceive public schools as low status. Publishing school rankings further undermines the satisfaction of teachers in low scoring schools (Alkutich, 2015; Ridge et al, 2015).

National-expatriate gap. Finally, if there is a gap that marks the UAE as a global outlier, it is the native-immigrant (national-expatriate) gap in student outcomes. In most countries or economies participating in PISA studies, native students perform better than students with an immigrant background. In contrast, in the UAE, not only do national students perform worse than expatriate students but this gap is one of the largest observed in PISA studies, the second largest after Qatar in PISA 2015 (OECD, 2018a). In PISA 2018, the UAE became the nation where this gap was largest (from 86 points in mathematics to 91 points in reading; OECD, 2019), with expatriate students performing as well as students in Luxembourg (a high-income country with average performance in PISA) and national students performing at the level of students in Indonesia (a low-income nation with very low performance in PISA). PISA analysts estimate this difference to be the equivalent of 2.5 to 3 years of schooling (Jerrim and Shure, 2016).

Research questions

The UAE has committed to reforms across all levels of education but academic performance of students in the UAE, particularly national students attending public schools, remains below that

observed on average across OECD countries. This is a concern given that, by the time national students enter the labour market, they lag behind expatriates in terms of work skills, which strain nationalization initiatives. To tackle this, an understanding of the national-expatriate gap is needed. Accordingly, we investigate the following:

1. What is the nature of the national-expatriate gap in students' academic performance?
2. Is this gap explained by the type of school (public or private) that students attend?

Methods

PISA 2018

We analyse data from PISA 2018, which includes a representative sample of 19,277 15-year-old students in the UAE, and in doing so use the following variables:

- Our dependent variables are academic performance in reading, mathematics and science. We analyse plausible values for the 3 subjects as described below.
- The most important explanatory variable is immigrant background; this dichotomous variable assigns a value of 0 to nationals (students who were born in the UAE and whose father and mother were born in the UAE) and a value of 1 to expatriates (students who were not born in the UAE or whose father or mother was not born in the UAE). Accordingly, 44% of 15-year-old students are nationals and 56% are expatriates.
- Other variables include:
 - Gender. This is a dichotomous variable (0 boys, 1 girls). There are 49% boys and 51% girls in the sample.
 - School type. This dichotomous variable assigns a value of 0 if the student is attending a public school and 1 if the student is attending a private school. Public schools are publicly operated and funded, while private schools are privately operated and funded; 40% of 15-year-old students in the sample attend public schools and 60% attend private schools.
 - Socioeconomic status. We use two different variables. In the linear regression analysis, we use a continuous variable derived from PISA's Economic, Social and Cultural Status (ESCS) index (for more details on ESCS, see PISA's technical report: OECD, 2019), which is re-standardized with reference to the UAE, where 0 indicates the mean and 1 the standard deviation in the country. When studying group differences, we use a categorical variable indicating whether the student belongs to the first, second, third, fourth or fifth quintile.
 - Emirate. This is a categorical variable indicating the emirate of the school the student is attending.
 - Country of origin of the student, father and mother. These categorical variables indicate whether the country of birth of the student, father and mother is the UAE, other GCC country, other Arabic (non-GCC) country or a non-Arabic country. In the sample 66% of 15-year-old students were born in the UAE, 2% were born in another GCC country, 12% in other non-GCC Arabic countries and 20% in a non-Arabic country. For the father and the mother of students, these percentages are, respectively, 40%, 4%, 25% and 30%; and 38%, 5%, 25% and 32%.

Table 1. National-expatriate gap in performance in reading, mathematics and science by emirate.

		UAE	Abu Dhabi	Dubai	Sharjah	Ajman	Umm Al Quwain	Ras Al Khaimah	Fujairah
Reading	Score	432	410	484	436	393	389	394	390
	National-expatriate gap	91	78	105	77	46	22	49	59
Math	Score	435	410	484	444	399	405	408	401
	National-expatriate gap	86	77	94	69	48	12	53	63
Science	Score	434	409	484	440	404	394	403	401
	National-expatriate gap	87	79	93	74	43	26	46	50

Analysis

Our first analysis explores how the national-expatriate gap differs across emirate, country of origin, gender, socioeconomic status and school type. It is conducted by estimating group differences and studying direct effects in a series of linear regression models. To account for PISA's design, we use replicate weights and analyse plausible values for reading, mathematics and science using multiple imputations (OECD, 2009, 2018b). To facilitate interpretation, we note that on average across OECD countries, a difference of 30 to 35 points is considered to be approximately equivalent to one additional year of education (Jerrim and Shure, 2016).

Results

Overview of the national-expatriate gap

We describe how the national-expatriate gap differs across emirate, by country of origin, by gender, across socioeconomic status and type of school.

The gap across emirates. As in many nations, geographical differences are large with variable performance between emirates (Table 1). The best performing emirate is Dubai (484 points on average across reading, mathematics and science), where scores are similar to those observed on average across OECD countries. The second-best is Sharjah (ranging between 436 in reading and 444 points in mathematics), where student performance is slightly above the national average in the UAE and similar to that observed in low-performing nations such as Serbia and Cyprus. Finally, students in the other five emirates (Abu Dhabi, Ajman, Umm Al Quwain, Ras Al Khaimah and Fujairah) score between 389 and 410 points depending on the subject, below the national average in the UAE. The gap between Dubai and Abu Dhabi is equivalent to between 2 and 2.5 years of schooling.

The gap by country of origin. Table 2 reveals differences by father, mother and student country of birth. Compared to Emirati-born students and parents, performance in the three core subjects is slightly higher among students born in other GCC countries and among those whose father or mother was born in another GCC country (by 10-20 points). It is also higher among students born in other non-GCC Arabic countries (around 40 points in the three core subjects) and among those whose father or mother was born in non-GCC Arabic countries (around 70 points in the three subjects). Academic performance in reading, mathematics and science is even higher among students born in non-Arabic countries (around 90 points in the three subjects) and those whose father or mother were also born in non-Arabic countries (around 110 points in the three subjects).

Table 2. Academic performance by country of birth of student, father and mother.

			Emirati born	Another GCC country	Another Arabic country	Any other country
Student	Reading	Score	411	415	452	500
		Difference with Emirati-born	-	4	41	89
	Math	Score	414	422	456	502
		Difference with Emirati-born	-	8	43	88
	Science	Score	413	424	457	499
		Difference with Emirati-born	-	11	44	86
Father	Reading	Score	383	410	454	497
		Difference with Emirati-born	-	27	71	114
	Math	Score	388	401	454	498
		Difference with Emirati-born	-	13	66	109
	Science	Score	386	403	457	494
		Difference with Emirati-born	-	17	71	108
Mother	Reading	Score	382	410	452	493
		Difference with Emirati-born	-	28	71	111
	Math	Score	389	401	452	494
		Difference with Emirati-born	-	12	63	105
	Science	Score	386	402	455	490
		Difference with Emirati-born	-	15	68	104

Table 3. National-expatriate gap by gender.

		Girls	Boys
Reading	Score	460	403
	National-expatriate gap	75	108
Math	Score	439	430
	National-expatriate gap	72	100
Science	Score	447	420
	National-expatriate gap	74	101

The gap by gender. Table 3 shows that for all subjects, girls in the UAE achieve higher levels of academic performance than boys, and the national-expatriate gap is greater among boys (between 100–108 points) than girls (72–75 points).

The gap across socioeconomic status. Table 4 shows that for all three subjects, scores increase as socioeconomic status rises. The ordinal socioeconomic status variables were derived from PISA's index of Economic, Social and Cultural Status (ESCS) as described in the methods section above. Likewise, the gap is greater among students of higher socioeconomic status.

The gap by school type. Shown in Table 5a, academic performance in reading, mathematics and science is 85 to 95 points higher in private schools than in public schools. Interestingly, the national-expatriate gap is greater in private schools (74 points in reading, 57 points in mathematics, 63 points in science) than public schools (43, 30 and 32 points respectively). Table 5b shows that for all students, regardless of background and country of birth, academic performance is higher among

Table 4. National-expatriate gap by socioeconomic status.

		Q1 (lowest SES)	Q2	Q3	Q4	Q5 (highest SES)
Reading	Score	371	399	434	470	481
	National-expatriate gap	32	66	77	96	112
Math	Score	374	403	436	471	483
	National-expatriate gap	35	67	74	88	95
Science	Score	375	402	436	471	478
	National-expatriate gap	38	67	75	90	97

Table 5a. National-expatriate gap by school type.

		Public	Private
Reading	Score	380	465
	National-expatriate gap	43	74
Math	Score	377	472
	National-expatriate gap	30	57
Science	Score	378	469
	National-expatriate gap	32	63

Table 5b. National-expatriate gap by school type, national or expatriate background and student country of birth.

		Public schools	Private schools	Diff.
National	Reading	375	412	37
	Math	374	431	57
	Science	375	423	48
Expatriate	Reading	418	486	68
	Math	403	488	85
	Science	406	487	81
Emirati-born	Reading	379	450	71
	Math	375	459	84
	Science	377	455	78
Another GCC country	Reading	431	458	27
	Math	423	465	42
	Science	418	467	49
Another non-GCC country	Reading	356	453	97
	Math	362	460	98
	Science	368	460	92
Non-Arabic country	Reading	409	502	93
	Math	420	504	84
	Science	422	500	78

those attending private schools. Differences are greater among expatriates (68-85 points) than national students (37-57 points), and greater among non-Emirati born than Emirati-born students, with the exception of those born in other GCC countries, where differences are smaller than among those born in the UAE.

Table 6. Proportion of students attending public and private schools, by background and country of birth of the student.

	Public schools	Private schools
National	71.86%	28.14%
Expatriate	13.74%	86.26%
Emirati-born	55.05%	44.95%
Another GCC country	41.48%	58.52%
Another Arabic (non-GCC) country	18.67%	81.33%
Other non-Arabic country	2.51%	97.49%

Finally, Table 6 shows that most national students (72%) attend public schools and only 28% attend private schools, while most expatriate students (86%) attend private schools and only 14% attend public schools. Table 6 also shows that among students not born in the UAE, those born in other GCC countries attend public schools to a greater extent than do those born in other non-GCC Arabic countries, while those born in non-Arabic countries rarely attend public schools.

Is the gap explained by school type? Table 6 suggests that the type of school attended by national and expatriate students of different origin partly explains differences in performance, yet Table 5a shows that when comparing national and expatriate students attending the same type of school (public or private), the gap remains large, and is larger in private schools.

Table 7 shows the results of a series of linear regression analyses, where models explore the gap in academic performance before and after controlling for variables of interest.

Model 1 (M1) reports the effect of being an expatriate student while controlling for gender. For the variable *girl*, the direct effect indicates the size of the gender gap in performance after controlling for immigrant background. For the variable *expatriate*, the direct effect indicates the size of the gap in performance after controlling for gender. Compared to results in Table 1, the national-expatriate gap does not change when controlling for gender. This gap is 91 points in reading, 86 points in mathematics and 87 points in science before (see Table 1) and after controlling for gender.

Model 2 (M2) uses school type as an explanatory variable. The direct effect indicates the size of the school type gap when controlling for other explanatory variables. When comparing the direct effect of the variable *expatriate* in Models 1 and 2 (Table 7), the gap decreases from 91 to 61 in reading, 86 to 46 in mathematics and 87 to 51 in science. That is, between 33% and 47% of the gap is explained by type of school attended.

Model 3 (M3) includes students' socioeconomic status; for this continuous variable, the direct effects indicate the effect of an increase of 1 standard deviation in the index of socioeconomic status in performance. The comparison of the direct effect of the variable *expatriate* in Models 2 and 3 reveals that the gap remains similar after controlling for socioeconomic status, suggesting that such differences in status do not explain performance differences.

Model 4 (M4) includes the same variables as Model 3 but substitutes *expatriate* for student country of birth. In this categorical variable, the reference category is 'Emirati-born' and the direct effect indicates the size of the gap between Emirati-born students and students born in other GCC countries, other non-GCC Arabic countries and non-Arabic countries after controlling for gender, socioeconomic status and school type. Comparing the gaps reported in Tables 2a, 2b and 2c with those in Table 7, the gap disappears for students born in other GCC countries (from small differences of 10 points to non-statistically significant differences) and decreases by more than

Table 7. Linear regression analysis I.

	M1		M2		M3		M4	
	B	SE	B	SE	B	SE	B	SE
Reading								
Girl	54***	2.73	55***	2.80	53***	2.61	55***	2.88
Expatriate	91***	2.52	61***	3.46	63***	3.20		
Private school			52***	3.15	33***	2.92	55***	2.71
Socioeconomic status					26***	1.07	24***	1.12
Student's country of birth (reference category: Emirati born)								
-Other GCC country							-5	8.10
-Other non-GCC Arabic country							19***	3.66
-Other non-Arabic country							48***	3.86
Mathematics								
Girl	6*	2.62	7**	2.33	5*	2.21	7**	2.19
Expatriate	86***	2.83	46***	3.78	48***	3.57		
Private school			69***	3.57	51***	3.60	66***	3.33
Socioeconomic status					25***	1.26	24***	1.30
Student's country of birth (reference category: Emirati born)								
-Other GCC country							-4	9.91
-Other non-GCC Arabic country							16***	4.69
-Other non-Arabic country							43***	3.92
Science								
Girl	23***	2.74	25***	2.68	23***	2.56	24***	2.61
Expatriate	87***	2.97	51***	4.17	53***	3.98		
Private school			63***	3.34	46***	3.32	63***	2.85
Socioeconomic status					24***	1.14	22***	1.18
Student's country of birth (reference category: Emirati born)								
-Other GCC country							0	9.79
-Other non-GCC Arabic country							19***	3.73
-Other non-Arabic country							42***	3.50

Notes: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; B indicates the beta coefficient (ie degree of change in the outcome variable for every 1-unit of change in the predictor variable); SE indicates the standard error.

half for students born in other non-GCC Arabic countries (from 41-44 to 16-19) and by half for those born in non-Arabic countries (from 86-89 to 42-48).

Model 5 (M5A-F in Table 8) contains the same variables as Model 3 and explores how school type varies by emirate. When comparing the direct effect of the variable expatriate in Model 5 in Table 8 to those in Table 1, the gap in the 3 subjects decreases in Abu Dhabi, Dubai and Sharjah and to a lesser extent Fujairah, remains more or less the same in Ras Al Khaimah, and increases in Umm Al Quwain. In Ajman, it decreases for reading and mathematics and increases for science. Although between 33% and 47% of the gap in performance is explained by the type of school students attend, percentages differ across emirates.

Discussion

The UAE is a global outlier for its reverse native-immigrant (national-expatriate) gap in student academic performance, the largest observed in PISA 2018, and believed to be equivalent to almost three years of schooling. Our analysis reveals the gap is bigger in the emirates that are host to greater cultural diversity of expatriates, and where overall levels of academic performance are higher. It is greater among boys, who perform academically worse than girls. It is greater among students of higher socioeconomic status, among whom levels of academic performance are higher overall. Further, it differs depending on students' country of origin, with those born in GCC countries performing slightly better than students born in the UAE, students born in non-GCC Arabic countries performing much better, and students from non-Arabic countries performing even more so. As the gap is greater in private schools, can the discrepancy be fully explained by school type?

School type and the gap in academic performance

Our analysis shows that academic performance is higher in private schools and that this applies to all categories of students, including the national Emirati students enrolled in them. This suggests that school type matters, and is further supported by the results from the linear regression analysis showing that the national-expatriate gap in academic competence decreases significantly (33% decrease in reading, 41% decrease in science and 47% decrease in mathematics) when comparing national and expatriate students attending the same type of school (see Table 7). In other words, the national-expatriate gap decreases by 33% to 47%, depending on the subject, once school type (public/private) is accounted for. When comparing students born in the UAE with those born in other countries, after accounting for school type, the gap decreases for students born in other GCC countries, shrinks by more than half for those born in non-GCC Arabic nations and by half for those born in non-Arabic nations.

Still, that the gap remains when comparing students attending the same type of school (public or private) suggests that it may also be influenced by individual and family characteristics, such as attitudes towards education, culture, educational background and occupational status of parents. Yet differences in socioeconomic status do not fully explain the gap, given that when incorporating this variable to the linear regression models, its size does not change. Rather, that the gap is greater in private schools may be explained by the fact that the comparison involves a different group of expatriate students (mostly non-Arabic students in private schools and GCC/non-GCC Arabic students in public schools). Among expatriates, differences in country of origin may also reflect differences in individual and family characteristics, status and attitudes towards education for example, as well as the selection biases that arise from their choice and ability to pay for private schools (Cathles et al, 2018; Mahuteau and Mavromaras, 2014; Pfeffermann and Landsman, 2011; Woessmann, 2016). The difference in curriculum between private and public schools may also account for this difference. Overall, the gap in academic performance is largely explained by the different type of schools attended by national and expatriate students and, to a lesser extent, by their socioeconomic attributes.

Recommendations

Our results mirror findings in the literature suggesting that the immigrant status of students and characteristics of the receiving country (in this case the UAE) are important when it comes to explaining gaps in academic performance (Cathles et al, 2018; Cattaneo and Wolter, 2015; Dustmann et al, 2012; Levels et al, 2008). In the UAE, this seems to emerge in the type of school

Table 8. Linear regression analysis 2: results by emirate.

	M5A		M5B		M5C		M5D		M5E		M5F	
	Abu Dhabi		Dubai		Sharjah		Umm Al Quwain		Ras Al Khaimah		Fujairah	
	B	SE	B	SE	B	SE	B	SE	B	SE	B	SE
Reading												
Girl	56***	2.95	39***	2.92	61***	10.75	59***	8.08	75***	5.32	71***	7.07
Expatriate	56***	3.97	76***	4.42	58***	10.47	43***	9.86	50***	8.31	51***	11.13
Private school	38***	4.52	34***	4.85	11	11.98	-33***	10.48	2	8.29	12	11.11
Socioeconomic status	22***	1.71	35***	2.25	23***	3.71	10***	2.73	17***	2.25	11***	3.27
Mathematics												
Girl	8**	3.10	-9*	3.82	11	7.26	20	11.05	20**	7.52	22**	8.71
Expatriate	41***	4.51	65***	5.08	40***	10.07	24*	11.31	46***	8.42	43***	11.70
Private school	65***	5.20	37***	6.20	36**	12.87	-15	11.99	11	9.68	25*	11.78
Socioeconomic status	23***	2.01	33***	2.24	19***	3.81	12***	3.56	17***	3.02	13***	3.52
Science												
Girl	27***	3.10	11**	3.73	28**	9.30	34***	8.03	40***	6.36	37***	6.90
Expatriate	45***	4.88	66***	4.66	54***	11.90	36***	9.54	49***	9.70	44***	11.14
Private school	63***	4.51	35***	5.27	19	13.58	-12	11.71	-2	8.62	9	10.46
Socioeconomic status	22***	1.54	30***	2.18	18***	4.15	9**	3.45	14***	2.68	15***	3.08

Notes: *** p<0.001; ** p<0.01; *p<0.05.

students attend and, to a lesser extent, the background of students who attend them. Indeed, a report (OECD, 2020) using the *Teaching and Learning International Survey* (TALIS), another achievement test which asks teachers and school leaders about working conditions and learning environments, as well as PISA survey data, suggested that UAE teachers face the most culturally diverse classrooms in the world and feel capable of managing such diversity to a greater extent than the OECD average. At the same time, they face more unruly classrooms with a range of problematic behaviours that detract from learning and require more intervention, time and effort than the OECD average. There are over 180 nationalities in the UAE, dozens of curriculum types and teacher training of all sorts imported alongside that which currently exists in national schools, all while the education system is still being developed. Recommendations are proffered here on a number of fronts, as follows.

Make public education a good choice

The unregulated expansion of private schools has undermined the public school system and reinforced inequality of access to education (Ridge et al, 2016; Vegas and Winthrop, 2020), with the ratio of expatriates to nationals in the UAE and other Gulf states fuelling such inequalities and offering a cautionary example of unrestricted private sector access to the education market. Yet, as the pandemic continues, top fee-charging schools seem to be fielding the biggest financial hits, while more moderate fee-charging schools report increases in student numbers coupled with decreases in fees to attract them (Rivzi, 2020). This shift may benefit students who wish to attend private schools for lower fees, but it may also boost the public school system as higher end schools close, and governments are forced to diversify and rely less on insecure revenue streams. Vegas and Winthrop (2020) urge governments to seize the moment by investing in public education, a vital point in the UAE given that it is national graduates who will ultimately drive the labour market as they remain and work in the country throughout their lifetimes. Yet good public schooling options could incentivize expatriate families to remain in the UAE where they would benefit from more affordable and good quality schooling. Investing in public education, rather than outsourcing the duty of care to the private sector, could more evenly distribute opportunity and reduce socio-economic inequality.

Localize needs and solutions

Across the Middle East/North Africa region, public education systems do not prepare students with core industry skills, and curricula are poorly aligned with industry needs (World Economic Forum, 2017). While improving, skills in English - the language in which public higher education institutions operate, remain low with many public school secondary students in the UAE graduating without adequate levels. One third of the federal budget for higher education was spent on remedial English in 2014 alone (Howling, 2017). While science, mathematics and reading are highlighted in PISA, emphasizing local needs such as language proficiency is justified to offset what many see as the imposition of OECD priorities (Araujo et al, 2017; Sjøberg, 2015).

Reform can be contentious in the UAE, as it is often led by foreign expertise at the expense of local stakeholder participation (Al-Fadala, 2015; Buckner et al, 2016; Ridge et al, 2017). Imported curricula offer the promise of success and idealize certain education cultures (Araujo et al, 2017; Pons, 2017). Yet 'what works' in international contexts overlooks 'what is' in local settings, such as poverty, disability and other disadvantages (Al-Hendawi and Keller, 2014; Ridge, 2014). While efforts are underway to build local capacity in teachers and schools overall

(OECD, 2020), valuing the experience of countries with similar challenges, as opposed to those that score high in the rankings but have vastly different socio-political contexts, may yield more fruitful results.

Further, a good education should not come at the expense of culture (Azzam, 2019). While the globalization of curriculum has prioritized English, the UAE is an Arabic country and youth benefit from being taught in their language (Troudi and Al Hafidh, 2017). Yet, a full reversion to Arabic is undesirable as there are economic returns to learning English. Introducing high quality bilingual education, as is done in Canada for instance, would boost social capital (Wright et al, 2015) and strengthen subsequent language attainment (Coppola, 2005).

Develop skills

It is argued that PISA reflects psychological traits (Borghans et al, 2016; Soland et al, 2019). Zamarro et al (2019) examined test-taking behaviour as a proxy for effort, finding that it explained between 33% and 41% of cross-country variation in PISA results. Skills such as persistence and emotional regulation also impact performance (Alan et al, 2019; Meindl et al, 2018), while subjective wellbeing scores similarly correlate with higher grade averages (Shoshani et al, 2016; Taylor et al, 2017). School curricula must develop non-cognitive skills, not merely to reflect gains in international assessments, but because employers demand them and they hold benefits for society (World Economic Forum, 2017). Prior studies conducted in the UAE and region suggest they are effective (see for instance Bassurah et al, 2021; Lambert et al, 2019).

Train teachers

Teacher training that matches curriculum changes is vital (Ridge et al, 2017). Shifts in attitude with respect to the role of teachers as facilitators of learning rather than deliverers of knowledge are ripe for exploration as many reforms have been imposed in the absence of the corresponding teacher skills needed to implement them. Further, UAE teachers want help with basic classroom management, special needs, and involving parents with learning (Buckner et al, 2016; OECD, 2020). Longer and more supportive induction periods, the creation of professional development networks, and the offer of peer appraisal and feedback mechanisms are other solutions that UAE-based teachers have identified as desirable (Buckner, 2017; OECD, 2020).

Involve Parents

Parental involvement in education, especially by Emirati fathers, remains weak across the country (Ridge and Jeon, 2020) and region (Al-Mahrooqi et al, 2016; Mahmoud, 2018; Ridge et al, 2020). Lack of involvement is linked to parents having had fewer years of education and not valuing education. Increasing father and parental involvement overall would help to raise student achievement, particularly with male students who more frequently drop out of schooling.

Focus on Boys

Buckner's (2018) analysis of the UAE's 2015 PISA scores prompted a call for a learning focus that capitalizes on male interests and fostering a warm and welcoming environment where boys are physically and emotionally secure. Safety in schools and classrooms remains an issue, with cases of bullying not only found in student populations, but with and between teachers as well as parents (OECD, 2016, 2020; Ridge et al, 2013).

Attend to Inequality

While socioeconomic status and achievement tend to be correlated (Sirin, 2005), wealth inequality and its markers must be tackled. Encouraging teachers to avoid preferential treatment for students of particular backgrounds, avoiding last names and regional markers which, in the UAE, are tied to family names and related wealth, may help to make lower socioeconomic class students, of any nationality, feel included and equal members of the school body. High-performing private schools could also consider offering needs-based scholarships to disadvantaged bright students.

Learn from Private Schools

While our recommendations are aimed at improving public schools, much can be learned from private schools; learning which factors contribute to their success may serve to inform public school reform. For instance, previous literature shows that when teachers (and schools) enjoy greater autonomy, student achievement rises (OECD, 2011b).

Implications For Global Educational Audiences

Although this study focuses on the UAE, our findings are relevant for other parts of the region, including Saudi Arabia and Qatar which share sociopolitical demographics, as well as Hong Kong and Singapore, which have similar guest worker arrangements and economic systems. These nations also have a strong private education sector and high concentrations of expatriate students. National approaches to studying the gap in academic performance must bridge the differences between private and public schools and limit the creation of a two-tiered system creating inequality as a result.

In some countries, policies can increase socioeconomic disadvantage with students facing difficulty due to language, acculturation, and socioeconomic status relative to the rest of society, as is often the case with immigrants. In others, such as the UAE and others that are culturally, economically and politically similar, expatriates are not expected to integrate; nor are they bound by the same labour market and higher education options thereafter. They are limited by choice of school, albeit with a degree of quality that is matched by price. In contrast, national students may face more uncertainty over time as public sector opportunities dwindle and a competitive private sector becomes the only route forward. The usual labour market protections and standard education policy prescriptions may be less applicable in this transition period. Accordingly, more research is needed and creative approaches to harmonising policies will be required. High PISA-scoring nations being proffered as international benchmarks to be emulated may not be ideal case studies in this regard.

Limitations

One limitation of our analysis is that it focuses only on 15-year-old students and may not reflect the national-expatriate gap at other ages of education. Second, limited information regarding the country of origin of expatriate students prevents further analysis. PISA data includes country of origin information but in the UAE, only whether the country of birth is the UAE, another GCC country, non-GCC Arabic country or non-Arabic country is stated. Third, equivalencies are stated in terms of years of schooling, yet the often-quoted figure suggesting 30 to 35 points equals 1 year of schooling is an estimate, and cross-country variation exists (Jerrim and Shure, 2016). Fourth, socioeconomic status is derived from PISA's ESCS index, which mainly reflects parents' educational status (see

PISA's technical report: OECD, 2019). Had measures such as family wealth and access to economic and material resources been included, the role played by socioeconomic status might differ. Finally, we adopted a quantitative research approach to analyse secondary data from an international study whose design does not necessarily account for the UAE's particularities. The analysis of data from UAE-specific studies and, in particular, the adoption of qualitative research approaches to study this phenomenon may better inform the addressing of issues related to the national-expatriate gap in academic performance and the role played by school type and other factors.

Conclusion

While the gap is significant, reforms to rectify it are ongoing. Still, the gap has immediate costs and plays out in the overall competitiveness of the nation. The Human Capital Index (World Bank, 2020) ranks how well nations develop human potential. Recent scores show that a child born today in the UAE will only reach 67% of their health, learning, and productivity potential. Given the UAE's high GDP, more emphasis on value for money in education spending must be prioritized (El-Saharty et al., 2020). Public schools must reform if the UAE is to meet its labour market needs as the private sector cannot continue to compensate for public institutional shortfalls (Bhayani, 2014; Rutter and Dedousis, 2016). This is especially salient as a free-market approach appears to exacerbate inequalities, and does little to improve public schools since private options are always available (Ridge et al, 2016). PISA scores, rather than in-country school rankings, must serve as the foundation from which educational reform is made, while adjusting for the domestic challenges reviewed, as well as a post-COVID-19 context. PISA scores can lend authority and justification for understanding as well as support the rectifying of public school deficiencies. They may also serve to inform the harmonizing of efforts towards raising the standard of education for national and expatriate students not only in the UAE, but also in similar high-expatriate nations striving to increase their human capital.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

ORCID iDs

Louise Lambert  <https://orcid.org/0000-0003-4651-929X>

Natasha Y Ridge  <https://orcid.org/0000-0003-3661-9043>

References

- Abdulla F and Ridge N (2011) Where are all the men? Gender, participation and higher education in the United Arab Emirates. In Lamine L (ed) *Towards an Arab higher educational space: International challenges and societal responsibilities: Proceedings of the Arab Regional Conference on Higher Education* (pp 125-136).
- Agwa H A and Salem I (2015) *A study of factors motivating expatriates in the United Arab Emirates*. International Proceedings of Economics Development and Research. 84: 108. Available at: <http://www.ipedr.com/vol84/014-E00024.pdf>
- Alan S, Boneva T and Ertac S (2019) Ever failed, try again, succeed better: Results from a randomized educational intervention on grit. *The Quarterly Journal of Economics*. 134(3): 1121-1162.
- Alkutich M (2015) *Examining the impact of school inspection on teaching and learning: Dubai private schools as a case study*. Dissertation from the British University in Dubai, Dubai (UAE). Available at: <https://bspace.buid.ac.ae/handle/1234/852>.

- Al-Fadala A (2015) *K-12 reform in the Gulf Cooperation Council (GCC) countries: Challenges and policy recommendations*. Available at: <https://www.wise-qatar.org/2015-wise-research-K12-reform-GCC-countries/>
- Al-Hendawi M and Keller C (2014) Beyond the walls of the school: Risk factors and children and youth in the Gulf. *Near and Middle Eastern Journal of Research in Education*. 1:1-7.
- Al-Mahrooqi R, Denman C and Al-Maamari F (2016) Omani parents' involvement in their children's English education. *SAGE Open*. 6(1): 1-12.
- Alsahi H (2020) *COVID-19 and the intensification of the GCC workforce nationalization policies*. Arab Reform Initiative. Available at: <https://www.arab-reform.net/publication/covid-19-and-the-intensification-of-the-gcc-workforce-nationalization-policies/>
- Alvaredo F, Assouad L and Piketty T (2019) Measuring inequality in the Middle East 1990-2016: The world's most unequal region? *Review of Income and Wealth*. 65(4): 685-711.
- Amirat A and Zaidi M (2020) Estimating GDP growth in Saudi Arabia under the government's Vision 2030: A knowledge-based economy approach. *Journal of the Knowledge Economy*. 11(3): 1145-1170.
- Ammermüller A (2005) *Poor background or low returns? Why immigrant students in Germany perform so poorly in PISA*. ZEW Discussion Papers. No. 05-18. Zentrum für Europäische Wirtschaftsforschung (ZEW), Mannheim. Available at: <http://hdl.handle.net/10419/24111>
- Araujo L, Saltelli A and Schnepf S (2017) Do PISA data justify PISA-based education policy? *International Journal of Comparative Education and Development*. 19(1): 20-34.
- Ashour S (2020) Quality higher education is the foundation of a knowledge society: Where does the UAE stand? *Quality in Higher Education*. 26(2): 209-223.
- Azzam Z (2017) Dubai's private school fees framework: A critical discussion. *Journal of Research in International Education*. 16(2): 115-130.
- Azzam Z (2019) Dubai's private K-12 education sector: In search of bilingual education. *Journal of Research in International Education*. 18(3): 227-256.
- Basurrah A, Lambert L, Setti A, Murphy M, Warren M, Shrestha T and di Blasi Z. (2021). Effects of positive psychology interventions in Arab countries: A protocol for a systematic review. *BMJ Open*. 11, e052477.
- Bhayani A (2014) The market route to higher education in UAE: Its rationales and implications. *International Review on Public and Nonprofit Marketing*. 11(1): 75-87.
- Borghans L, Golsteyn B H, Heckman J and Humphries J E (2016) What grades and achievement tests measure. *PNAS* 113(47): 13354-13359.
- Buckner E (2017) *The status of teaching and teacher professional satisfaction in the United Arab Emirates*. Sheikh Saud bin Saqr Al Qasimi Foundation for Policy Research. Available at: <https://publications.alqasimifoundation.com/en/the-status-of-teaching-and-teacher-professional-satisfaction-in-the-united-arab-emirates> doi:10.18502/aqf.0119
- Buckner E (2018). *The other gap: Examining low-income Emiratis' educational achievement*. Sheikh Saud bin Saqr Al Qasimi Foundation for Policy Research. Available at: <https://publications.alqasimifoundation.com/en/the-other-gap-examining-low-income-emiratis-educational-achievement> doi:10.18502/aqf.0120
- Buckner E, Chedda S and Kindreich J (2016) *Teacher professional development in the UAE: What do teachers actually want?* Sheikh Saud bin Saqr Al Qasimi Foundation for Policy Research. Available at: <https://publications.alqasimifoundation.com/en/teacher-professional-development-in-the-uae-what-do-teachers-actually-want> doi:10.18502/aqf.0039
- Burton G (2017) *Improving assessment in Dubai's education system*. Mohammed Bin Rashid School of Government. Available at: <https://www.mbrsg.ae/home/research/education-policy/improving-assessment-in-dubai%E2%80%99s-education-system>
- Bussière P, Hébert R and Knighton T (2009) *Educational outcomes at age 21 associated with reading ability at age 15*. Education Matters: Insights on Education, Learning and Training in Canada. 6(2), Statistics Canada Catalogue no. 81-004-X.
- Campos-Vazquez R M (2018) Returns to cognitive and non-cognitive skills: Evidence for Mexico. *Applied Economics Letters*. 25(16): 1153-1156.

- Cattaneo M A and Wolter S C (2015) Better migrants, better PISA results: Findings from a natural experiment. *IZA Journal of Migration*. 4(1): Article 18.
- Cathles A, Ou D, Sasso S, Setrana M and van Veen T (2018) *Where do you come from, where do you go? Assessing skills gaps and labour market outcomes of young adults with different immigration backgrounds*. Available at: https://www.econstor.eu/bitstream/10419/181357/1/cesifo1_wp7157.pdf
- Coppola J (2005) English language learners: Language and literacy during the preschool years. *New England Reading Association Journal*. 41(2): 18-23.
- Crawford L, Hares S, Le Nestour A and Minardi A L (2019) *PISA 2018: A few reactions to the new global education rankings*. Available at: <https://www.cgdev.org/blog/pisa-2018-few-reactions-new-global-education-rankings>
- Dave C, Shami S and Ridge N (2016) *An experimental investigation of the determinants of teacher quality: Risk, patience or altruism?* Sheikh Saud bin Saqr Al Qasimi Foundation for Policy Research. Available at: <https://publications.alqasimifoundation.com/en/an-experimental-investigation-of-the-determinants-of-teacher-quality> doi:10.18502/aqf.0117
- DeAngelis C A (2018) The public benefit of private schooling: Test scores rise when there is more of it (Policy Analysis #830). CATO Institute. Available at: <https://www.cato.org/publications/policy-analysis/public-benefit-private-schooling-test-scores-rise-when-there-more-it>
- Delprato M and Chudgar A (2018) Factors associated with private-public school performance: Analysis of TALIS-PISA link data. *International Journal of Educational Development*. 61: 155-172.
- Donkers J and Robert P (2008) Differences in scholastic achievement of public, private government-dependent, and private independent schools: A cross-national analysis. *Educational Policy*. 22(4): 541-577.
- Dustmann C, Frattini T and Lanzara G (2012) Educational achievement of second-generation immigrants: An international comparison. *Economic Policy*. 27(69): 143-185.
- Edin P A, Fredriksson P, Nybom M and Öckert B (2017) *The rising return to non-cognitive skill*. Available at: <https://www.iza.org/publications/dp/10914/the-rising-return-to-non-cognitive-skill>
- El-Saharty S, Kheyfets I, Herbst C H and Ajwad M I (2020) *Fostering human capital in the Gulf Cooperation Council countries*. World Bank. Available at: <https://doi.org/10.1596/978-1-4648-1582-9>
- El-Sholkamyl M and Al-Saleh Y (2017, March). *Paying for education in Dubai: Is it really worth it?* Mohammed Bin Rashid School of Government. Available at: <https://www.mbrsg.ae/home/research/education-policy/paying-for-education-in-dubai-is-it-really-worth>
- Fuller K and Stevenson H (2019) Global education reform: Understanding the movement (Editorial). *Educational Review*. 71(1): 1, 1-4.
- Gibson L, Rodriguez C, Ferguson S J, Zhao J and Hango D (2019) *Does reading proficiency at age 15 affect employment earnings in young adulthood?* Insights on Canadian Society, Statistics Canada Catalogue 75-006-X. Available at: <https://www150.statcan.gc.ca/n1/pub/75-006-x/2019001/article/00015-eng.htm>
- Government of the United Arab Emirates (2018, December 17) *Raising the standard of education*. Available at: <https://government.ae/en/about-the-uae/leaving-no-one-behind/4qualityeducation/raising-the-standard-of-education>
- Hahn R A and Truman B I (2015) Education improves public health and promotes health equity. *International Journal of Health Services: Planning, Administration, Evaluation*. 45(4): 657-678.
- Hanushek E A, Schwerdt G, Wiederhold S and Woessmann L (2015) Returns to skills around the world: Evidence from PIAAC. *European Economic Review*. 73(C): 103-130.
- Hanushek E A and Woessmann L (2008) The role of cognitive skills in economic development. *Journal of Economic Literature*. 46(3): 607-668.
- Harding S, Morris R, Gunnell D, Ford T, Hollingworth W, Tilling K, . . . Kidger J (2019) Is teachers' mental health and wellbeing associated with students' mental health and wellbeing? *Journal of Affective Disorders*. 242: 180-187.
- Hippe R and Jakubowski M (2018) *Immigrant background and expected early school leaving in Europe: Evidence from PISA*. Available at: <https://ec.europa.eu/jrc/en/publication/immigrant-background-and-expected-early-school-leaving-europe-evidence-pisa>

- Hopfenbeck T N, Lenkeit J, El Masri Y, Cantrell K, Ryan J and Baird J A (2018) Lessons learned from PISA: A systematic review of peer-reviewed articles on the Programme for International Student Assessment. *Scandinavian Journal of Educational Research*. 62(3): 333–353.
- Howling C (2017) *The need for ability grouping in English classes in public schools in the UAE*. Sheikh Saud bin Saqr Al Qasimi Foundation for Policy Research. Available at: <https://publications.alqasimi-foundation.com/en/the-need-for-ability-grouping-in-english-classes-in-public-schools-in-the-uae> doi:10.18502/aqf.0045
- Jerrim J and Shure N (2016) *Achievement of 15-year olds in England: PISA 2015 national report*. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/574925/PISA-2015_England_Report.pdf
- Kamal K and Trines S (2018, August 10) *Education in the United Arab Emirates*. Available at: <https://wenn.wes.org/2018/08/education-in-the-united-arab-emirates>
- Lambert L, Passmore H-A, Scull N, Al Sabah I and Hussain R (2019) Wellbeing matters in Kuwait: The Alnowair's Bareec education initiative. *Social Indicators Research*. 143(2): 741-763.
- Lange G-M, Wodon Q and Carey K (2018) *The changing wealth of nations 2018: Building a sustainable future*. World Bank. Available at: <https://openknowledge.worldbank.org/handle/10986/29001>
- Lee J N and Newhouse D (2013) *Cognitive skills and youth labor market outcomes*. Available at: <http://documents.worldbank.org/curated/en/662341520411124442/Cognitive-skills-and-youth-labor-market-outcomes>
- Levels M, Dronkers J and Kraaykamp G (2008) Immigrant children's educational achievement in western countries: Origin, destination, and community effects on mathematical performance. *American Sociological Review*. 73(5): 835–853.
- Mahmoud S (2018) Saudi parents' perceptions of the kind of help they offer to their primary school kids. *English Language Teaching*. 11(3): 102-112.
- Mahuteau S and Mavromaras K (2014) *Student scores in public and private schools: Evidence from PISA 2009* (Discussion Paper No. 8471). IZA Institute of Labor Economics. Available at: <https://www.iza.org/publications/dp/8471/student-scores-in-public-and-private-schools-evidence-from-pisa-2009>
- Meindl P, Yu A, Galla B M, Quirk A, Haec C, Goyer J P, . . . Duckworth A L (2018) A brief behavioral measure of frustration tolerance predicts academic achievement immediately and two years later. *Emotion*. 19(6): 1081-1092.
- O'Grady K, Deussing M, Scerbina T, Tao Y, Fung K, Elez V and Monk J (2019) *Measuring up: Canadian results of the OECD PISA 2018 study*. Available at: https://www.cmec.ca/Publications/Lists/Publications/Attachments/396/PISA2018_PublicReport_EN.pdf
- Oreopoulos P and Salvanes K (2011) Priceless: The nonpecuniary benefits of schooling. *Journal of Economic Perspectives*. 25(1): 159-184.
- Organization for Economic Cooperation and Development (OECD) (2009) *PISA data analysis manual: SPSS, 2nd edition*. PISA, OECD Publishing, Paris, France. Available at: <https://doi.org/10.1787/9789264056275-en>.
- Organization for Economic Cooperation and Development (OECD) (2010) Introduction: The case for linking PISA with longitudinal studies. In OECD (ed) *Pathways to success: How knowledge and skills at age 15 shape future lives in Canada*. OECD Publishing, Paris, France. Available at: <https://doi.org/10.1787/9789264081925-2-en>.
- Organization for Economic Cooperation and Development (OECD) (2011a) *Private schools: Who benefits?* PISA in Focus no. 7. Available at: <https://www.oecd.org/pisa/pisaproducts/pisainfocus/48482894.pdf>
- Organization for Economic Cooperation and Development (OECD) (2011b) *School autonomy and accountability: Are they related to student performance?* PISA in Focus no. 9. Available at: <https://www.oecd.org/pisa/pisaproducts/pisainfocus/48910490.pdf>
- Organization for Economic Cooperation and Development. (OECD) (2016) *PISA 2015 results (Volume I): Excellence and equity in education*. Paris, France: OECD. Available at: <https://doi.org/10.1787/9789264266490-en>.

- Organization for Economic Cooperation and Development (OECD) (2018a) *The resilience of students with an immigrant background: Factors that shape well-being*. OECD Reviews of Migrant Education. Paris, France: OECD. Available at: <https://doi.org/10.1787/9789264292093-en>
- Organization for Economic Cooperation and Development (OECD) (2018b) *PISA 2015 technical report*. Paris, France: OECD. Available at: <https://www.oecd.org/pisa/data/pisa2018technicalreport/>
- Organization for Economic Cooperation and Development (OECD) (2019) *United Arab Emirates - Country note - PISA 2018 results*. Available at: http://www.oecd.org/pisa/publications/PISA2018_CN_ARE.pdf
- Organization for Economic Cooperation and Development (OECD) (2020) *Teaching in the United Arab Emirates: 10 lessons from TALIS*. Available at: https://www.oecd.org/education/talis/Teaching_in_the_UAE-10_Lessons_from_TALIS.pdf
- Ostrovsky Y and Frenette M (2014) *The cumulative earnings of postsecondary graduates over 20 years: Results by field of study*. Economic Insights, Statistics Canada Catalogue no. 11-626-X – No. 040.
- Pfeffermann D and Landsman V (2011) Are private schools better than public schools? Appraisal for Ireland by methods for observational studies. *The Annals of Applied Statistics*. 5(3): 1726–1751.
- Pons X (2017) Fifteen years of research on PISA effects on education governance: A critical review. *European Journal of Education*. 52(2): 131–144.
- Rautalin M, Alasuutari P and Vento E (2019) Globalisation of education policies: Does PISA have an effect? *Journal of Education Policy*. 34(4): 500–522.
- Ridge N (2014) *Education and the reverse gender divide in the Gulf States: Embracing the global, ignoring the local*. New York, NY: Teachers College Press.
- Ridge N, Farah S and Shami S (2013) *Patterns and perceptions in male secondary school dropouts in the United Arab Emirates*. Sheikh Saud bin Saqr Al Qasimi Foundation for Policy Research. Available at: <http://www.alqasimifoundation.com/admin/Content/File-1612201535124.pdf>
- Ridge N, Han S and Dingus D (2020) *Father involvement and education in the GCC* (Policy Paper No. 44). Sheikh Saud bin Saqr Al Qasimi Foundation for Policy Research. Available at: <https://publications.alqasimifoundation.com/en/father-involvement-and-education-in-the-gcc>
- Ridge N and Jeon S (2020) Father involvement and education in the Middle East: Geography, gender, and generations. *Comparative Education Review*. 54(4). Available at: <https://publications.alqasimifoundation.com/en/father-involvement-and-education-in-the-middle-east-geography-gender-and-generations>
- Ridge N, Kippels S and Chung B J (2017) *The challenges and implications of a global decline in the educational attainment and retention of boys*. WISE (World Innovation Summit for Education, Doha, Qatar)/ Al Qassimi Foundation, Sharjah, UAE. Available at: https://www.wise-qatar.org/app/uploads/2019/04/rr.2.2017_qasimi.pdf
- Ridge N, Kippels S and Farah S (2017) *Curriculum development in the United Arab Emirates*. Sheikh Saud bin Saqr Al Qasimi Foundation for Policy Research. Available at: <https://publications.alqasimifoundation.com/en/curriculum-development-in-the-united-arab-emirates>
- Ridge N, Kippels S, Shami S and Farah S (2015) *Who benefits from private education in the UAE and Qatar?* Sheikh Saud bin Saqr Al Qasimi Foundation for Policy Research. Available at: <https://publications.alqasimifoundation.com/en/who-benefits-from-private-education-in-the-uae-and-qatar> doi:10.18502/aqf.0033
- Ridge N, Shami S and Kippels S (2015) Arab migrant teachers in the United Arab Emirates and Qatar: Challenges and opportunities. In *Arab Migrant Communities in the GCC: Working Group Summary Report No. 12*. Available at: <https://repository.library.georgetown.edu/bitstream/handle/10822/713078/CIRSSummaryReport12ArabMigrantCommunities2015.pdf;sequence=5>
- Ridge N, Shami S and Kippels S (2016) Private education in the absence of a public option: The cases of the United Arab Emirates and Qatar. *FIRE: Forum for International Research in Education*. 3(2): 41–59.
- Ridge N, Shami S and Kippels S (2017) Arab migrant teachers in the United Arab Emirates and Qatar: Challenges and opportunities. In Babar Z (ed) *Arab migrant communities in the GCC*. London: Hurst Publishers.
- Ridge N, Shami S, Kippels S and Farah S (2014) *Expatriate teachers and education quality in the Gulf Cooperation Council*. The Sheikh Saud bin Saqr Al Qasimi Foundation for Policy Research. Available

- at: <http://www.alqasimifoundation.com/en/publication/21/expatriate-teachers-and-education-quality-in-the-gulf-cooperation-council>
- Rivzi A (2020, June 11) Coronavirus: UAE's most expensive schools forecast to take hit as parents look to save cash. *The National*. Available at: <https://www.thenational.ae/uae/education/coronavirus-uae-s-most-expensive-schools-forecast-to-take-hit-as-parents-look-to-save-cash-1.1032188>
- Rutter R and Dedoussis E (2016) Workforce localisation and change management: The view from the Gulf. In Goksoy A (ed), *Organizational change management strategies in modern business*. Hershey, PA: Business Science Reference. pp 301-327.
- Sakellariou C (2017) Private or public school advantage? Evidence from 40 countries using PISA 2012-Mathematics. *Applied Economics*. 49(29): 2875-2892.
- Shoshani A, Steinmetz S and Kanat-Maymon Y (2016) Effects of the Maytiv positive psychology school program on early adolescents' well-being, engagement, and achievement. *Journal of School Psychology*. 57: 73-92.
- Singer J D and Braun H I (2018) Testing international education assessments. *Science*. 360(6384), 38–40.
- Sirin S R (2005) Socioeconomic status and academic achievement: A meta-analytic review of research. *Review of Educational Research*. 75(3): 417–453.
- Sjøberg S (2015) PISA and global educational governance: A critique of the project, its uses and implications. *Eurasia Journal of Mathematics, Science and Technology Education*. 11(1): 111-127.
- Soland J, Zamorro G, Cheng A and Hitt C (2019) Identifying naturally occurring direct assessments of social-emotional competencies: The promise and limitations of survey and assessment disengagement meta-data. *Educational Researcher*. 48(7): 466-478.
- Sørensen K L and Krassel K F (2019) Childhood and adulthood skill acquisition: Importance for labor market outcomes. *Journal of Economics and Economic Education Research* 20(1), Available at: <https://www.abacademies.org/articles/childhood-and-adulthood-skill-acquisition-importance-for-labor-market-outcomes-7842.html>
- Taylor R D, Oberle E, Durlak J A and Weissberg R P (2017) Promoting positive youth development through school-based social and emotional learning interventions: A meta-analysis of follow-up effects. *Child Development*. 88(4): 1156-1171.
- Troudi S and Al Hafidh G (2017) The dilemma of English and its roles in the United Arab Emirates and the Gulf. In Mahboob A and Elyas T (eds) *Challenges to education in GCC during the 21st century*. Cambridge: Gulf Research Center, pp 93-116.
- Vegas E and Winthrop R (2020, September 8) *Beyond reopening schools: How education can emerge stronger than before COVID-19*. Brookings Institute. Available at: <https://www.brookings.edu/research/beyond-reopening-schools-how-education-can-emerge-stronger-than-before-covid-19/>
- Warner R S and Burton G J (2018). *A fertile oasis: The current state of education in the UAE*. Mohammed Bin Rashid School of Government. Available at: <https://www.mbrsg.ae/home/research/education-policy/a-fertile-oasis-the-current-state-of-education-in>
- Witschge J, Rözer J and Werfhorst H G (2019) Type of education and civic and political attitudes. *British Educational Research Journal*. 45(2): 298–319.
- Woessmann L (2016) The importance of school systems: Evidence from international differences in student achievement. *Journal of Economic Perspectives*. 30(3): 3-32.
- World Bank (2016) *UAE. Population total*. Available at: <https://data.worldbank.org/indicator/SP.POP.TOTL?locations=AE>
- World Bank (2020) *United Arab Emirates Human Capital Index Report*. Available at: https://databank.worldbank.org/data/download/hci/HCI_2pager_ARE.pdf
- World Economic Forum (2017) The future of jobs and skills in the Middle East and North Africa: Preparing the region for the Fourth Industrial Revolution. Available at: http://www3.weforum.org/docs/WEF_EGW_FOJ_MENA.pdf
- Wright W E, Boun S and Garcia O (2015) Introduction: Key concepts and issues in bilingual and multilingual education. In Wright WE, Boun S and Garcia O (eds) *Handbook of bilingual and multilingual education*. Malden, MA: Wiley-Blackwell.

- Yakovlev P and Leguizamon S (2012) Ignorance is not bliss: On the role of education in subjective well-being. *The Journal of Socio-Economics*. 41(6): 806–815.
- Zamarro G, Hitt C and Mendez I (2019) When students don't care: Re-examining international differences in achievement and student effort. *Journal of Human Capital*. 13(4): 519-552.
- Zhao Y (2016) Who's afraid of PISA: The fallacy of international assessments of system performance. In Harris A and Jones MS (eds) *Leading futures*. Thousand Oaks, CA: SAGE, pp 7-21.
- Zhao J, Ferguson SJ, Dryburgh H, Rodriguez C and Gibson L (2017) *Does education pay? A comparison of earnings by level of education in Canada and its provinces and territories*. Census in Brief. Statistics Canada Catalogue no. 98-200-X

Author biographies

Jose Marquez is a Research Associate at the Manchester Institute of Education, University of Manchester, UK.

Louise Lambert is an Associate Professor of Psychology at the Canadian University Dubai, Dubai, United Arab Emirates.

Nathasha Y Ridge is Executive Director of the Sheikh Saud bin Saqr Al Qasimi Foundation for Policy Research, in Ras Al Khaimah, United Arab Emirates.

Stuart Walker is Executive Principal of RDFZ Kings College School Hangzhou, China.