QATAR EDUCATION STUDY

2012, 2015, and 2018

Social and Economic Survey Research Institute

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INTRODUCTION

The leadership of Qatar has invested in the education sector because it views education as the key to the nation's continued economic and social progress. Over the years, the government has shaped its public policies, budgets, and strategic plans to diversify the economy and reduce its dependence on the natural gas and oil-based linear economy. Accordingly, Qatar has taken active measures to enhance its education sectors by heavily investing in levels of education and research. To meet the rising demands of the increasing population of citizens and residents of Qatar, Qatar has expanded the number of government, Arab private, community, and international schools available across the country.

To this end, His Highness Sheikh Hamad Bin Khalifa Al-Thani announced reforms in 2002 to enhance educational quality. Accordingly, the launch of Education for a New Era (EFNE), an educational reform initiated in 2002, constituted a key step in the government's endeavor to improve the public school system. Central to these attempts is the need for a modern, high-quality curriculum that is responsive to student and societal needs. The national curriculum standards are at the heart of Qatar's educational reform. In 2008, the state of Qatar articulated long-term national goals and values in the Qatar National Vision 2030, which set the framework for growth and development. In fulfillment of this mission, the QNV 2030 "aims to build a modern world-class educational system that provides students with a first-rate education, comparable to that offered anywhere in the world." This strategic vision cements the need for immediate changes in the curriculum, administrative system, and infrastructure aimed at improvement.

The Qatar Education Survey (QES) is a resource for policymakers with a variety of topics pertaining to how students, parents, teachers, and administrators view the current education system. Collecting and analyzing this data is a massive undertaking, requiring SESRI to publish the results in stages. This publication is a sampling of the most timely and relevant issues and focuses on those findings that link directly to education reform goals and performance indicators outlined in the Education and Training Sector Strategy 2011-2016 (ETSS) of the Supreme Education Council (SEC) and in the Qatar National Development Strategy 2011-2016 (NDS).

When the survey was first administered in 2012, the National Development Strategy (NDS) and the Education and Training Sector

Strategy, 2011–2016 (ETSS) were only recently implemented (Supreme Education Council, 2012). The QES 2015 was able to examine the impact of these strategies at a later stage. The QES 2018 has provided further insight into the success of these national strategies. Importantly, after the first two surveys, Qatar experienced a blockade by three of its neighboring countries. Considering this major challenge, it was necessary to evaluate if the blockade imposed on Qatar had significant implications for the country's education sector.

The main goal of these reports is to inform education policy and practice while also contributing to achieving the overall goals outlined in the Qatar National Vision 2030. Based on the results provided in these reports, relevant implications for policy and practice will be offered as they relate to the specific areas covered in each report. This book is divided into three sections covering the years 2012, 2015, and 2018, when the study was conducted. For the sections pertaining to 2012 and 2015, each is divided into three chapters related to students' motivation, school facilities, and parental satisfaction. The 2018 section is divided into five chapters pertaining to students' motivation and future aspirations, school facilities, the school curriculum, student and parental satisfaction, and private tutoring.

While this report draws attention to some of the shortcomings in the current K–12 system, we view this as an ideal opportunity to assess the state of K–12 education in Qatar in order to provide more effective programs and solutions with the long-term goal of fulfilling the mission of the Qatar National Vision 2030. Forthcoming reports on K–12 education as well as topics pertaining to social, economic, and cultural areas in Qatar and the region can be found at sesri.qu.edu.qa. We welcome your questions and comments, which can be directed to sesri@qu.edu.qa.

Professor Kaltham Al-Ghanim
Director of the Social and Economic Survey Research Institute

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ABOUT THE SOCIAL AND ECONOMIC SURVEY RESEARCH INSTITUTE

This report was produced by the Social and Economic Survey Research Institute (SESRI). Established in 2008, the mandate of the Institute is to conduct survey research on issues related to the development and welfare of Qatari society, including in social, economic, and cultural areas. To this end, SESRI aims to provide high-quality data that may be used to guide policy formulation, priority setting, and evidence-based planning and research in the social and economic sectors. Equally important, the Institute strives to build capacity at Qatar University in survey research methodology by serving as a platform for QU faculty and students to conduct their own research. Along those lines, the Institute offers training in survey research related to topics of interest to the university community as well as to Qatari society as a whole.

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INTRODUCTION

The leadership of Qatar is greatly invested in its K–12 education because it views education as the key to the nation's economic and social progress. To this end, His Highness Sheikh Hamad Bin Khalifa Al- Thani, the Father Emir, announced a sweeping education reform in 2002 to enhance educational quality and renewed this commitment in 2013 with a 360 billion riyal health and education fund.[1] Even with a well-developed public education system, few Qataris before 2002 were qualified for positions that could fully meet the demands of the economic, social, and cultural changes underway in the country, not to mention the challenges of a global economy. In 2008, following years of comprehensive planning and analysis, the state of Qatar articulated long-term national goals and values in the Qatar National Vision 2030 (QNV 2030)[2], which sets the framework for growth and development, mainly through advanced, high-quality education and training services. In fulfilment of this mission, the QNV 2030 "aims to build a modern world-class educational system that provides students with a first-rate education, comparable to that offered anywhere in the world."[3]

The Qatar National Development Strategy 2011-2016 (NDS)[4] outlines the targets for achieving the goals in the QNV 2030, and the Education and Training Sector Strategy 2011-2016 (ETSS)[5] of the Supreme Education Council (SEC) identifies the measurable outcomes and projects to prepare citizens for the future. Both of these strategies are in the early phases of implementation, making this an ideal time to consider attitudes toward the current state of K–12 education. The Qatar Education Survey (QES) providers sources for policymakers with a variety of topics pertaining to how students, parents, teachers, and administrators view the current education system. We focus in this report on four policy-relevant areas that speak to targets outlined in the NDS and ETSS:

- Student motivation and satisfaction;
- Student plans for higher education and future careers;
- Parent participation and communication with school officials; and
- Teacher and administrator attitudes toward the school system.

One of the most recent achievements has been the transformation of all public schools into autonomous Independent schools. According to the NDS, as Independent schools flourish, competition is expected to emerge not only across Independent schools but also between Independent and

private schools. This report focuses on the differences between the Independent schools and other schools--grouping International, community, and Arabic private schools together--to consider how attitudes toward education vary across Independent schools and these private alternatives.

This report examines the views of children, parents, teachers, and administrators toward K–12 education in Qatar. It is based on results from the Qatar Education Study (QES), which is a series of surveys conducted by the Social and Economic Survey Research Institute (SESRI) in December 2012. Together, the surveys included more than 4,200 participants from 39 preparatory and secondary schools. The following table has the details

Table 1 : Survey Sample

Total Number of surveyed schools	**39 school**	
	Independent Schools **24 school**	Other Schools **15 school**
Total number of surveyed students	**1848 student**	
	Independent Schools **1158 student** **742 Qatari students**	Other Schools **690 student**
Total number of surveyed parents	**1472 parent**	
	Independent Schools **877 parent** **514 Qatari parents**	Other Schools **595 parent**
Total number of surveyed teachers	**572 teacher**	
	Independent Schools **384 teacher** **77 Qatari teachers**	Other Schools **188 teacher**
Total number of surveyed school administrators	**318 admin**	
	Independent Schools **205 admin** **109 Qatari admin**	Other Schools **113 admin**

These surveys help capture attitudes on a number of issues pertaining to schools in Qatar from current participants in preparatory and secondary education. The schools in the sample represent a cross-section of the major school types (e.g., Independent, private) and coeducational and single-gender programs. The design of the QES allows for comparison within groups (e.g. all students in grade 8 or 9) and makes it possible to examine an issue from the combined perspective of students, parents, and

educators. Examining the attitudes of all members of the education system will assist in the development of future plans for education in Qatar.

Collecting and analyzing these data is a massive undertaking, requiring SESRI to publish the results in stages. This executive report is a sampling of the most timely and relevant issues and focuses on those findings that link directly to education reform goals and performance indicators outlined in the Education and Training Sector Strategy 2011-2016 (ETSS) of the Supreme Education Council (SEC) and in the Qatar National Development Strategy 2011-2016 (NDS). This report presents findings in four policy-relevant areas and makes recommendations for each:

Student motivation:

Renewed attention needs to be placed on student motivation as many students exhibit signs of chronic motivational problems.

Student plans for the future:

Interventions need to be developed to increase student interest in careers in the knowledge economy and to make certain that their career goals are aligned with their planned level of education.

Parent participation and communication with the schools:

While there is evidence that communication between parents and the schools has improved, interventions are required to increase the level of parent participation in their child's education both in the home and in official school activities.

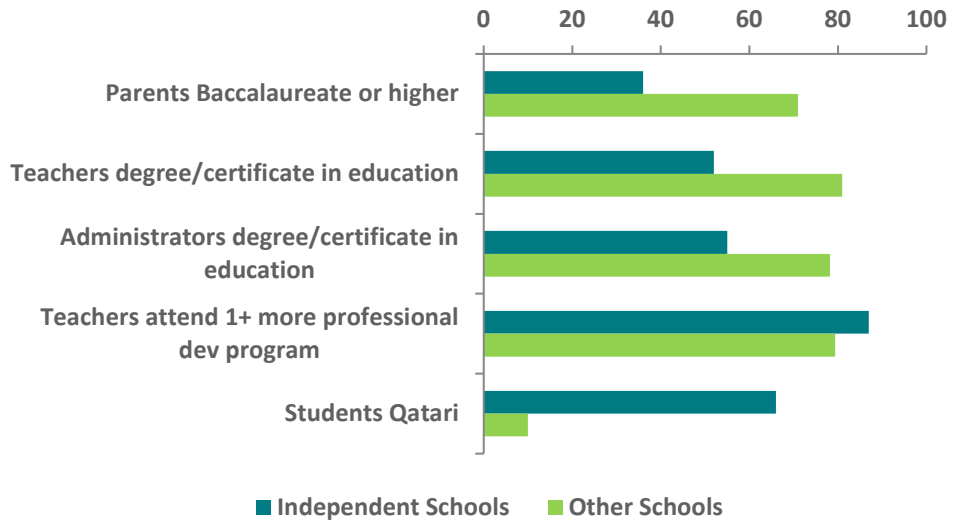
Teacher and administrator attitudes toward the school system:

Methods need to be explored to ensure that teachers and administrators feel valued by the SEC and feel that their input matters to the SEC in educational reform.

We recognize that students live in a complex environment outside of school that, along with important structural differences across schools, affects educational attainment, training and career aspirations (Figure 1). Equity and inclusiveness are critical components of Qatar's education reform (ETSS p. 10) and an important resource students bring to the schools is their parents' educational background. Numerous studies in other countries have documented differences in students' educational outcomes based on their parents' education, in particular, between students whose parents have a college education versus those who do not[6]. There is a large difference in this regard between students in Independent schools (36 percent with parents with a baccalaureate[7] or higher) compared to other schools (average of 71 percent). Equity also

becomes an issue when we consider teacher training and qualifications. A degree or certificate in education is one measure to gauge the preparedness of teachers and administrators, yet we see slightly more than half of the educators in Independent schools reporting a background in education[8]. While many Independent school teachers report attending one or more professional development programs (and in fact, attend more training than teachers at other schools), it cannot substitute for university-level coursework and certification in the field of education.

Figure1: An Overview of the School Climate in Independent and Other Qatari Schools



The policy question then becomes, are Independent schools able to make up for these differences in background and resources, or do the advantaged become even more advantaged? Administrators, teachers, peers, and parents interact in complex ways to affect students' educational progress. This report explores these interactions by examining the attitudes of each of these major players in the K–12 system.

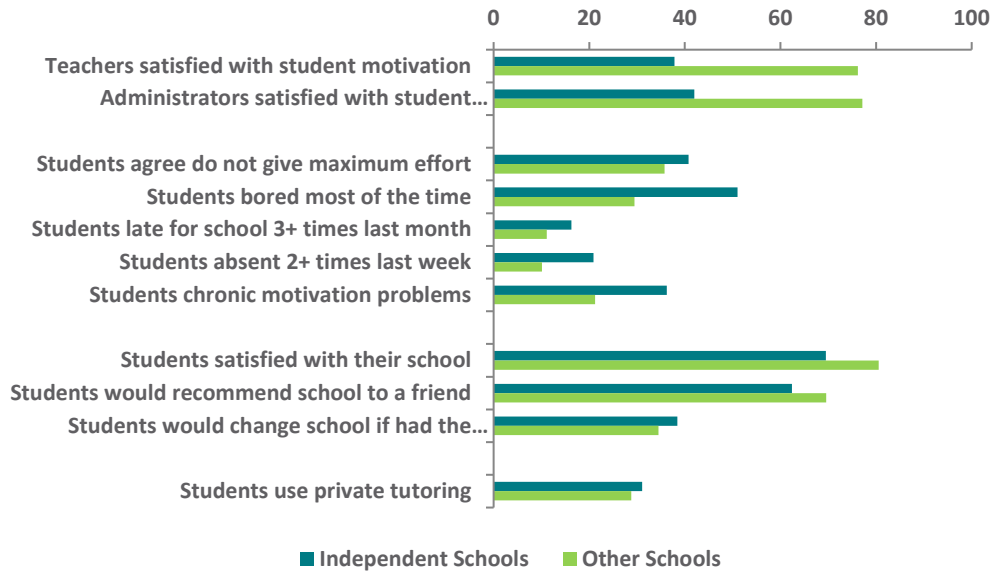
It begins by looking at how motivated students are in their current learning environment and whether they are satisfied with the status quo. We then turn to the student's plans for post-secondary education and training. Then we shift to the perspective of the parents: how active are they in the education of their children and do they receive adequate feedback from school officials about their child's performance? Finally, we consider whether teachers and administrators are pleased with the state of affairs at their school and with the SEC. At the end of each section, we provide specific policy recommendations for furthering the objectives of the NDS and ETSS.

Student Motivation and Satisfaction.

Increasing student motivation is a major goal outlined in the NDS and remains a concern for K–12 parents and educators (p. 131). If students are bored with school, put in little effort, and are frequently absent, their education will suffer. The QES explores this problem, asking students, teachers, and administrators about student motivation9.

When it comes to student motivation[10], there are large differences in satisfaction among teachers and administrators at Independent schools compared to other schools (Figure 2). Twice as many teachers at other schools (78 percent) are satisfied with student motivation as teachers at Independent schools (38 percent). The difference is nearly as great with administrators' satisfaction (77 percent versus 42 percent, respectively).

Figure 02: Student Motivation and Satisfaction with their Schools



Based on student reports, teachers and administrators have valid concerns about student motivation. Half of the students at Independent schools say they feel bored "most of the time" at school,

compared to 30 percent of students at other schools. Another 41 percent of students at Independent schools and 36 percent at other schools either strongly or somewhat agree that they do not put their maximum effort into

studying. A count of four indicators representing poor student motivation – being bored in school, not putting maximum effort into studying, being absent from school, and being late for school – reveals that 36 percent of the students in Independent schools and 21 percent in other schools exhibit chronic motivation problems[11,12,13]. The situation among Qataris at Independent schools is even more acute as shown in the following table:

Table 2: Comparisons within Independent Schools

Comparisons Within Independent Schools		
Independent Schools [Teachers' Response]	Qatari	Non-Qatari
Teachers satisfied with student motivation	46%	36%
Independent Schools [Administrators' Response]	Qatari	Non-Qatari
Administrators satisfied with student motivation	53%	30%
Independent Schools [Students' Response]	Qatari	Non-Qatari
Students agree do not give maximum effort	42%	38%
Students bored most of the time	55%	43%
Students late for school 3+ last month	17%	11%
Students absent 2+ last week	22%	16%
Students satisfied with their school	66%	75%
Students would recommend school to a friend	62%	63%
Students would change school if had the chance	41%	34%
Students use private tutoring	37%	18%

The QES also includes a number of measures to gauge student satisfaction. Nearly 70 percent of Independent school students and 80 percent of other students report that they are "very" or "somewhat" satisfied with their school. Approximately two-thirds of Independent school students and 70 percent of other students would recommend their school to a friend. However, despite these generally high levels of satisfaction, over one-third of all students would change schools if they had the chance.

There is considerable variation across Independent schools in the percent of students who would like to change schools, ranging from a low of 21 percent to a high of 67 percent. Within the other schools, the range goes from a low of 8 percent to a high of 52 percent. Reliance on private tutoring can be another sign of problems with the schools. A high percentage of students in private tutoring may suggest that students' educational needs are not being met by their schools. Overall 31 percent of the students at Independent schools and 29 percent at other schools report that they use private tutors. More secondary school students use private tutoring (35 percent) than do preparatory students (25 percent). While these levels are not troubling on their own, students' reasons for private tutoring indicate potential problems with their school education. Students that use private tutoring were asked to check up to six possible reasons for their use of tutors[14]. The most common reason cited by over two-thirds of the students in both Independent and other schools is "to pass exams." The next most frequently cited reason is that "teachers do not explain the material well" (34 percent of Independent school students versus 28 percent of other students).

Recommendation:

If motivation to learn is a key driver of success, then strengthening student motivation should remain a top priority to fulfill the goals of the QNV 2030. The deliverable outlined in the NDS is to create a comprehensive communication and motivation plan to raise awareness of the value of education and consequences of education decisions. We would recommend an increased focus on enhancing student motivation. No matter how high their educational and career aspirations, if students lack the proper motivation to attend and to complete school work, they will have a hard time meeting their goals.

The Center on Education Policy at The George Washington University issued a 2012 report summarizing the research on student motivation and outlining successful programs to improve student motivation[15]. The report outlines three types of school-based efforts: (1) targeted intervention programs for students with low motivation; (2) programs focused on teachers as motivators; and (3) efforts to reorganize schools. Many of the programs discussed in the report may have utility in Qatar. For example, a program designed for boys vulnerable to dropping out of school used a series of methods including close monitoring, participation in extra-curricular activities, and personal motivators for the boys. At the end of the first year, the boys' motivation – measured by multiple means – increased. A second program conducted within Baltimore targeted chronically absent students and developed individual interventions including mentors, home

visits, and meetings with their parents, leading to an increased graduation rate and decreased absences.[16]

Student Plans for Higher Education and Careers in Knowledge Economy Fields

Higher education, especially at Qatar University, has recently changed to improve standards, enhance student engagement, and recruit teachers with appropriate degrees (NDS p. 137). Education City continues to attract high caliber universities from around the world. Yet Qatari students struggle once they graduate from secondary school: low enrollment and high dropout rates in higher education continue to be a problem as students choose to enter the labor market without post-secondary qualifications (NDS p.138).

To increase the number of students prepared for a knowledge-based economy, advising students on the steps to become a professional in their chosen field needs to begin at an early stage. As we see in the QES, 65 percent of the students in Independent schools and 71 percent in other schools plan to obtain at least a baccalaureate degree[17]. While these numbers are encouraging, when compared to the level of confidence they have in actually completing secondary school, the prospects are not as bright. However, the percentage of Qatari male students planning to obtain B.A. degree or equivalent is the least among all groups as indicated in the following table:

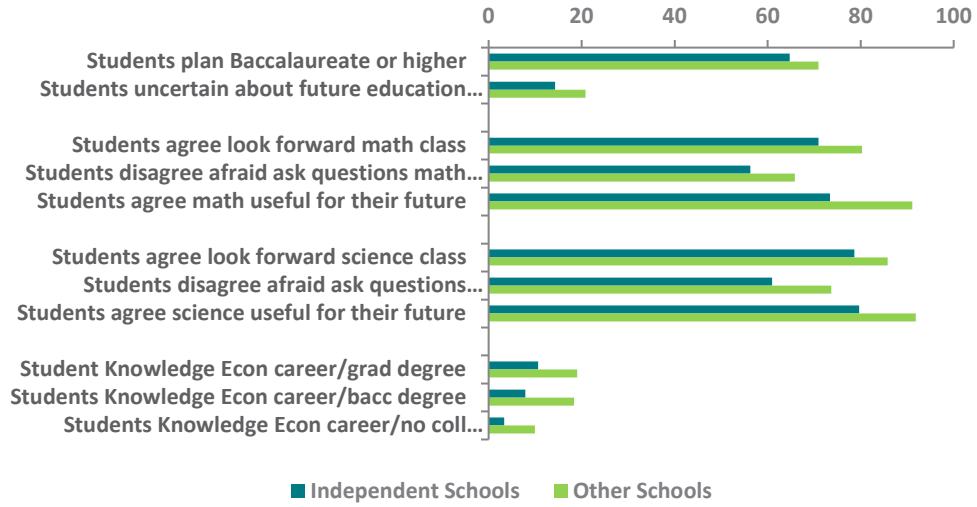
Table 3: Comparisons within Independent Schools

Comparisons Within Independent Schools		
Independent Schools [Students' Response]	**Qatari**	**Non-Qatari**
All students plan Baccalaureate or higher	**65%**	77%
- Girls plan Baccalaureate or higher	***72%***	84%

- Boys plan Baccalaureate or higher	*60%*	69%
Students uncertain about future education plans	15%	13%
- Girls uncertain about future education plans	*15%*	11%
- Boys uncertain about future education plans	*15%*	15%

Of the Independent school students, only 56 percent who plan on obtaining a baccalaureate degree and 76 percent who plan on a graduate degree feel "very confident" that they will graduate from secondary school, indicating they expect to have problems meeting the requirements for university entry or secondary school graduation. Less than half of the remaining Independent school students are "very confident" that they will graduate from secondary school.

Figure 3: Student Plans for Future Education and Careers in Knowledge Economy Fields



Students come from disparate home backgrounds, and these backgrounds have an effect on their educational plans. Looking just at the students from Independent schools, one-quarter of the students whose parents never attended school are uncertain about their educational plans. Another 21 percent plan on, at most, completing high school. In contrast, only 12 percent of students whose parents have a graduate degree and 11 percent of those with a baccalaureate degree are uncertain about their educational plans. These results indicate that schools are not erasing the

differences in students' home backgrounds; early identification of these low motivated students is vital to interventions that increase the likelihood of post-secondary school entry and success.

Students also attend schools in which their peers have varying educational aspirations. Within the Independent schools, the range of students planning to obtain at least a baccalaureate degree has a low of 36 percent to a high of 89 percent. The range is similar in other schools with a low of 28 percent and a high of 91 percent of students planning on obtaining a baccalaureate degree. Students whose parents never attended college and who are enrolled in schools where their peers have low educational aspirations face serious obstacles to obtaining a college degree.

Recently the State of Qatar has invested substantial resources into research and development, and while the infrastructure is in place, there is a shortage of citizens graduating from knowledge economy fields[18]. As such, one of the targets of the QNV 2030 is to enhance scientific research by increasing the proportion of science and math graduates (NDS p. 143). The QES students are too young to be employed in the knowledge economy but have already begun to make education and career plans[19]. There are a variety of occupations that fall within the knowledge economy rubric, and many have specific educational prerequisites for even entry-level positions. While technicians in a biological laboratory may only have taken some college classes, or attended some vocational training programs, the chief scientists in the biological laboratory or in other fields will have graduate degrees, and in many cases a Ph.D. Therefore, it is critical to look at students' education plans in conjunction with their career plans. Despite having generally positive attitudes toward science and math classes and about the utility of the subjects for their future[20], only 11 percent of the Independent school students and 19 percent of other students both plan on a career in the knowledge economy and intend to obtain a graduate degree (Figure 3). Another 8 percent of the Independent school students and 18 percent in other schools seek a knowledge economy profession but intend to end their education with a baccalaureate. Finally, three percent of the students in Independent schools and ten percent in other schools hope for a career in the knowledge economy but do not intend to obtain a baccalaureate degree.

Recommendation:

College and career counseling interventions should start early and occur at regular intervals during a child's preparatory and secondary education. Critical to the program is the notion that college and career counseling

must begin as early as elementary school to develop a college- going culture early in the child's education.[21]

This is further supported by research showing that students begin developing educational aspirations at a young age[22]. One suggestion targeted for parents that would be useful is to create public events for parents at a variety of times and locations to give them information about college for their children and the importance of educational aspirations, and to let them know that they are critical for their child's future education. Separate events could be held for parents of primary, preparatory, and secondary students, to ensure that a college-going culture is developed. Within the schools, a variety of activities can be done throughout the school years to help students learn more about colleges. For example, teachers and other professional staff members can be encouraged to share information about their college experiences and a series of presentations can be used to introduce students to a large number of career fields, connecting those fields directly to post-secondary education.

Much work remains if more knowledge economy positions are to be filled with well-trained Qataris in the future. At every level of education, more students in private schools aspire to a career in the knowledge economy than do students in Independent schools. Yet the Independent schools are where the majority of Qatari parents enroll their students (Figure 1). While there is a vital need for employment in the knowledge economy, the misalignment of educational aspirations and career plans indicates a basic misunderstanding of the education required for key knowledge economy positions. We recommend interventions such as one-on-one post-secondary counselling and career field trips at two stages of a student's education: prior to entry into secondary school (year 8 or 9 or the equivalent) and two years prior to graduation from secondary school (year 10 or equivalent). There is also a need for more programs to excite students about careers in the knowledge economy, along with information about the educational prerequisites for the positions.

The National Academy of Sciences recommends incorporating such programs throughout the school years, beginning as early as kindergarten, to develop an interest in knowledge economy fields[23]. The recent announcement that a memorandum has been signed to develop and strengthen the Robots Program and Robotics Olympiad in Qatar's schools is encouraging development[24]. The National Science Foundation (NSF) in the United States funds numerous programs to encourage students – in particular underrepresented groups – at a variety of ages to consider a

career in a knowledge economy position and many of these may provide insights for Qatar[25]. A report from the University of Massachusetts Donahue Institute details a range of programs that have increased student interest in careers in the knowledge economy[26]. For example, the Engineering is Elementary program trained teachers in a curriculum that uses hands-on and inquiry-based skills, with a particular emphasis on engineering. The students of the teachers in the program showed an increased interest in a career in engineering. In the Digits program, professionals employed in knowledge economy fields visit sixth- grade classrooms and lead discussions about the importance of math and science and share their experiences in the field. Students showed an increased perception of knowledge economy fields as being fun and exciting after participating in the program.

Parental Participation and Communication with School Officials

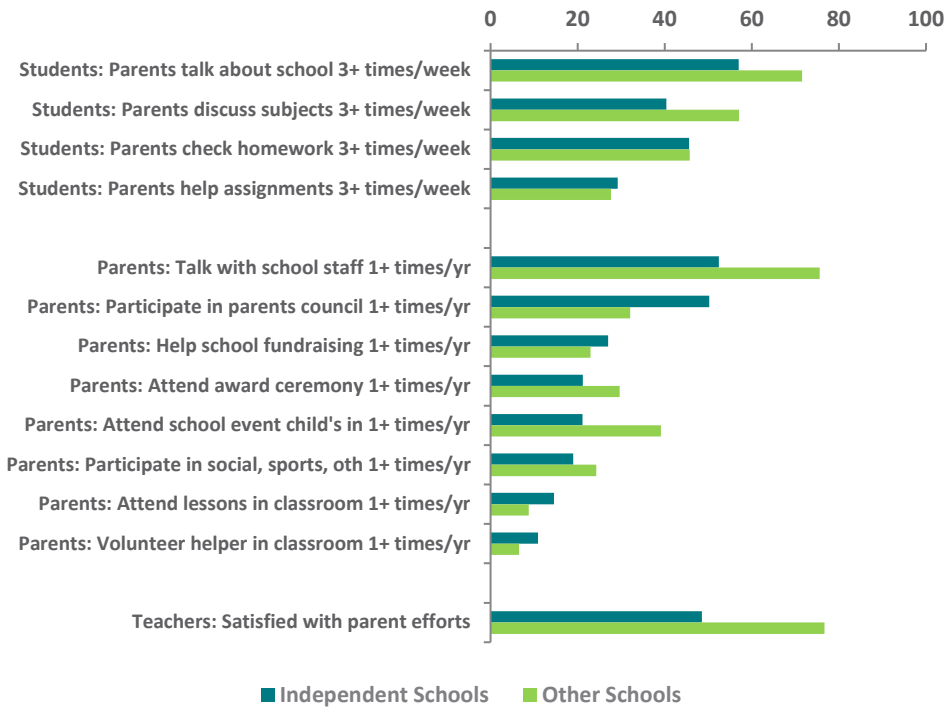
Parental involvement in a child's education is consistently found to be positively associated with both short-term school performance and long-term career aspirations[27]. Some studies in the United States argue that parental involvement is more important than the school itself for academic achievement[28]. Accordingly, the NDS identifies improving parental participation in K–12 education as a goal for the QNV 2030 (p. 136-137). The QES collected information from students, parents, teachers, and administrators to assess parental involvement with the schools (Figure 4).

Parent-student conversations and helping out with schoolwork are the most direct forms of parental involvement. Students were asked how frequently their parents talked about school or helped with school work in the past week. The most frequently reported activity was talking to parents or guardians about school, with 57 percent of the students in Independent schools and 72 percent in other schools engaged in this activity three or more times a week. In contrast, less than one-third of the students reported that their parents or guardians help them with homework three or more times a week.

In addition to talking with their child or helping with homework, parents also attend various activities and events at the school, and it is these activities that are most obvious to teachers and administrators. Parents were asked how many times – since the beginning of the school year – they or another family member participated in any of eight different school activities. With the exception of talking with a teacher, principal, or supervisor about their child (52 percent of Independent school parents and

76 percent of other parents say at least once), less than half of parents reported participating in any of the other activities at least once since the beginning of the school year.

Figure 4: Parent Involvement with Child's Education



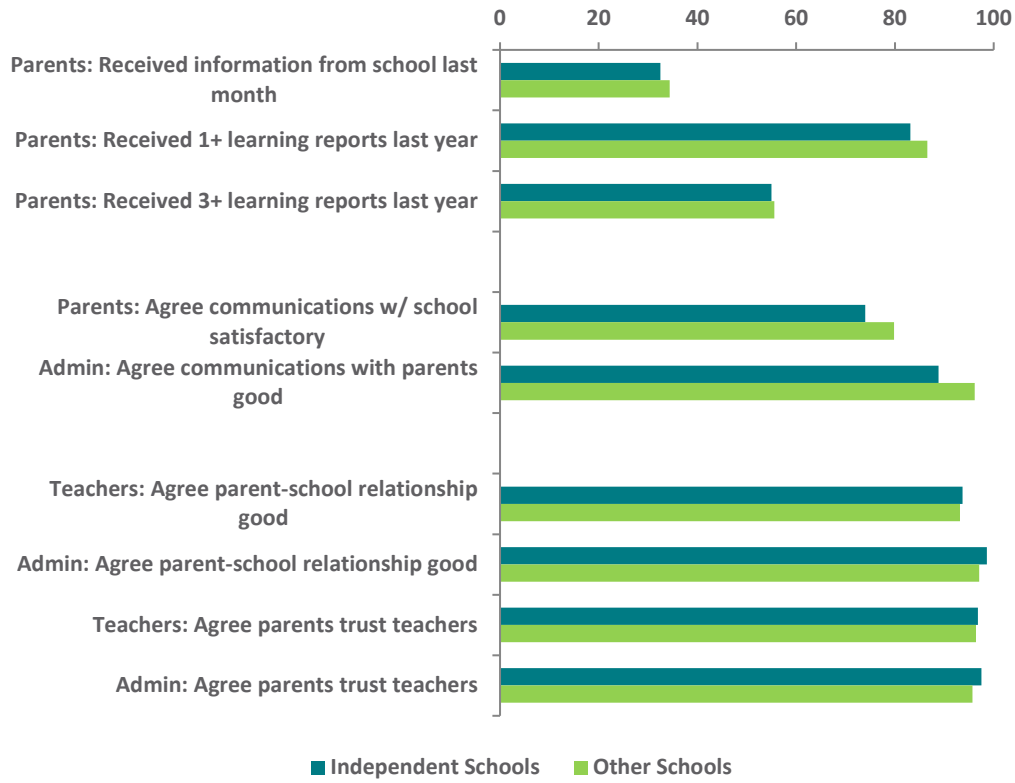
Nearly 30 percent of the parents from Independent schools did not participate in any of the activities since the beginning of the school year, compared to only 15 percent of parents from other schools. However, over 32 percent of Independent school parents and 39 percent of other parents participated at least once in three or more of the activities.

Given the above information, it is not surprising that teachers do not express high levels of satisfaction with parent efforts. Only 8 percent of Independent school teachers and 16 percent of other teachers are very satisfied with the level of parental effort in schools. Another 40 percent of Independent school teachers were somewhat satisfied (compared to 61 percent of other teachers), leaving over half of the Independent school teachers as somewhat or very dissatisfied with parental efforts.

In order to improve parental participation in K–12 education, the NDS calls for school officials to engage parents more actively through parent-teacher associations and other informal activities for information exchange (p. 136). The QES explores whether this information exchange between parents and school officials has been successful (Figure 5). Approximately one-third of both Independent and other school parents reported receiving information from the school about their child in the last month.

The majority of parents receiving information were given one (36 percent of Independent school parents, 51 percent other parents) or two (37 percent of Independent parents and 24 percent of other parents) pieces of information from the schools. Parents were also asked how many learning performance reports they received about their child in a typical year. Over half of the parents receive a report three or more times a year while less than 20 percent never receive a performance report about their child.

Figure 5: The Relationship between Parents, the Schools, and School Personnel



Simply providing information to parents is not enough; parents must find it useful and satisfactory for the communication to be meaningful. The QES gathered information about the quality of communications from both school personnel and parents. School administrators overwhelmingly feel that communication with parents is good. Nearly half of Independent school administrators and 64 percent of other administrators strongly agree that communication with parents is good and 33 percent of other administrators and 41 percent of Independent school administrators somewhat agree. Parents are somewhat less enthusiastic about the quality of communication. Only 30 percent of Independent school parents and 27 percent of other school parents strongly agree that the level of communication between the school and parents is satisfactory, while 53 percent of other school parents and 44 percent of Independent school parents somewhat agree.

Despite concerns about parental effort, 56 percent of teachers strongly agree, with another 38 percent somewhat agreeing, that the relationship between parents and the school is good. Administrators are even more

positive than teachers. Nearly all administrators (99 percent at Independent schools and 97 percent at other schools) agree that the relationship is good. Teachers and administrators have similarly positive beliefs about the trust parents hold in teachers.

Recommendation:

While efforts to increase communication among the pts and educators appear to be working, there is room for improvement in terms of parental involvement. The challenge is finding meaningful ways to get parents more involved in schools and in their homes to provide support and encouragement for their children. Part of the problem concerns parents who do not have the means to help their children either because of their own education level or a lack of other resources. We have two recommendations in this regard. The first is to encourage parents to go back to school and complete a vocational or post-secondary degree. This has the added bonus of generating new workers for the knowledge economy and fulfils the activity of encouraging lifelong learning (ETSS p.8-9). Second, after-school and weekend programs for parents and children to learn the subject matter together and to provide parents with assistance to help their children learn have been shown in other contexts to greatly improve parental involvement and student mastery of the materials[29].

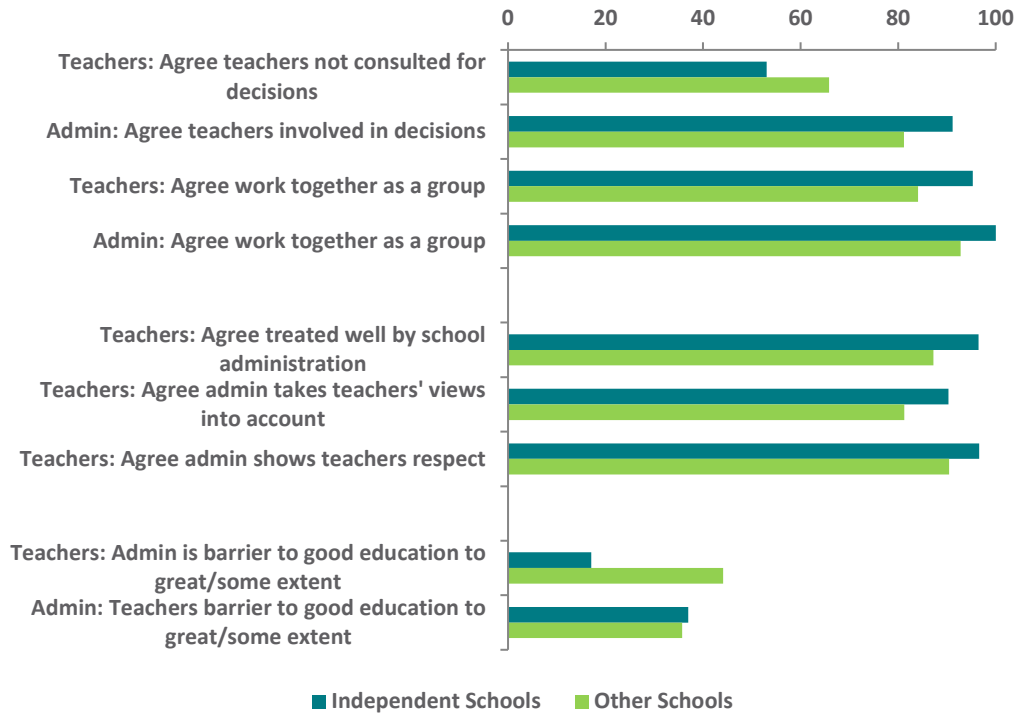
While there is the widespread use of private tutoring in Qatar, it is important to remember that 68 percent of the students in independent schools do not use private tutoring. Looking just at the students in Independent schools, 30 percent receive no or minimal help at home and also do not participate in private tutoring. Another 38 percent receive some level of help at home but do not participate in private tutoring. Clearly, there is a need for additional help for these students, particularly those whose parents have fewer resources to invest in their education. Additionally, tutoring does not substitute for a lack of parent involvement with their child's education. Students whose parents do such things as stress the importance of a college education, talk with them about college, provide a space for them to do homework and make certain that they complete their homework have more positive educational outcomes than students whose parents are uninvolved.[30] We would recommend that programs be developed to give parents more information about how to prepare their child for university while also emphasizing the importance of their role in their child's education.

Teacher and Administrator Feelings about Schools

According to the NDS, teacher turnover is high in Qatar (p. 129), yet teachers and school administrators play a critical role in preparing young Qataris for the economic and technological challenges of the future. Poor teacher-administrator relationships may signal systemic problems within schools, becoming a barrier to education and leading to attrition. In this section we examine the feelings of the two groups towards each other, education, and the SEC.

Administrators and teachers were asked a parallel set of questions regarding school decision- making and working together as a group. Administrators in both Independent and other schools have a more positive view than do teachers of the role teachers have in the school decision-making process. When asked, 53 percent of Independent school teachers and 66 percent of other teachers strongly agree or somewhat agree that "school management takes decisions without consulting teachers." (Figure 6) In contrast, 91 percent of Independent school administrators and 81 percent of other administrators strongly agree or somewhat agree that "teachers are involved in the decision making process at the school." Despite these differences, teachers and administrators both overwhelmingly say that they strongly agree or somewhat agree that "teachers and the administration work together as a group at the school."

Figure 5: Teacher and Administrator Feelings about Each Other

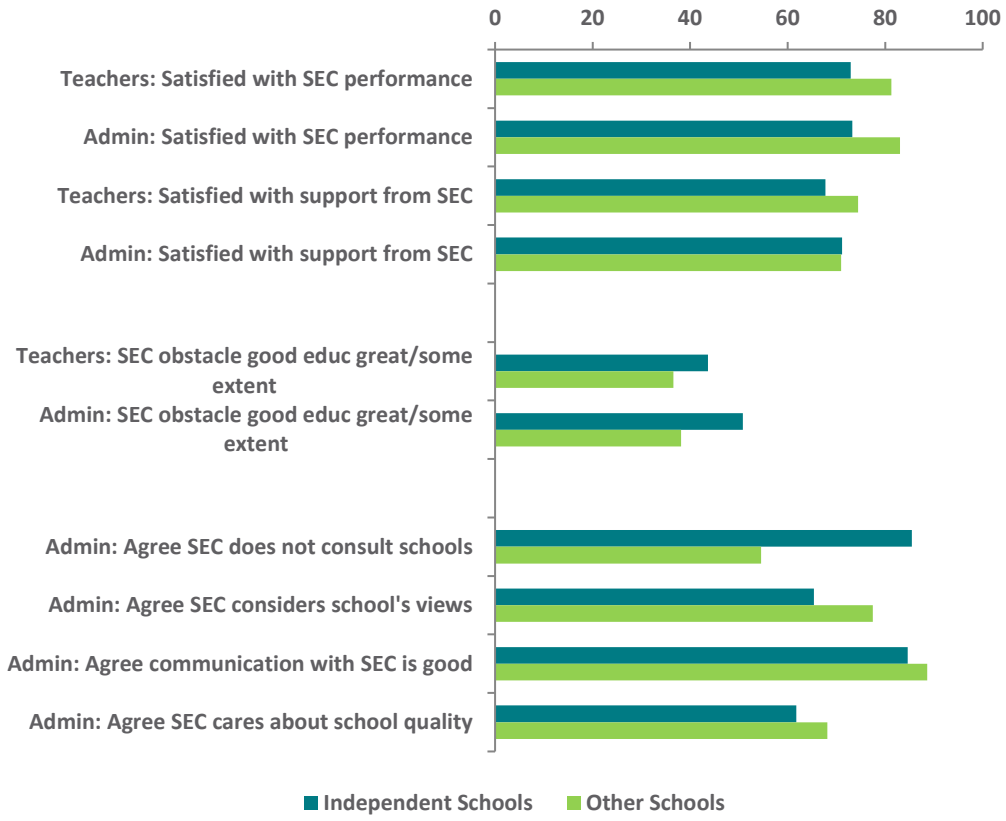


Teachers have generally positive views about the treatment they receive from the school administration. Nearly 80 percent of Independent school teachers and 62 percent of other teachers strongly agree that "the school management shows respect to teachers."

Almost 70 percent of Independent teachers and 47 percent of other teachers strongly agree that "teachers are treated well by the school management." Although teachers have some doubts about their actual role in decision-making, 52 percent of Independent teachers but only 38 percent of other teachers strongly agree that "the school management takes into consideration teachers' views on the educational issues related to the school."

Both teachers and administrators were asked to indicate the extent to which a series of factors are an obstacle to a good education in Qatar. Overall, 16 percent of Independent teachers and 43 percent of other teachers feel administrators are a barrier to good teaching to a "great extent" or "some extent." Similarly, 37 percent of Independent administrators and 36 percent of other administrators feel that teachers are a barrier to good education to a "great extent" or "some extent."

Figure 6: Teacher and Administrator feelings about the Supreme Education Council



Teachers and administrators were also asked for their assessment of the SEC (Figure 7). Within Independent schools, 73 percent of both teachers and administrators are satisfied with the performance of the SEC compared to 81 percent of teachers and 83 percent of administrators at other schools. Teachers and administrators report similar levels of satisfaction with the support received from the SEC. At Independent schools, 68 percent of teachers and 71 percent of administrators are satisfied with SEC support, while 74 percent of other teachers and 71 percent of other administrators are satisfied with the support. When asked to what extent the SEC is an obstacle to good education, 51 percent of Independent school administrators and 44 percent of Independent school teachers find the SEC to be an obstacle to a "great extent" or "somewhat extent." Among other school personnel, 37 percent of teachers and 38 percent of administrators believe that the SEC is an obstacle to good education to a great or to some extent.

By virtue of their positions, administrators are more directly responsible for implementing educational policy. As such, they were asked additional questions about the SEC. Although 85 percent of Independent school administrators and 89 percent of other school administrators agree that "communication with the SEC is good," they also have some concerns. A substantial percentage of Independent school administrators (85 percent versus 55 percent of other administrators) agree that the "SEC takes decisions without consulting schools."

Recommendation:

The SEC leads the effort to transform Qatar into a country that provides all students opportunities commensurate with the best schools, vocational training, and universities found anywhere in the world. If the SEC is to achieve the targets outlined in the NDS, it will need the support of school administrators and teachers, who will implement the vision the QNV 2030. While the NDS states the need for a feedback mechanism between post-secondary and K–12 education, we would argue for a similar framework for administrators and teachers to provide feedback to the SEC regarding new programs meant to meet the targets of the QNV 2030. One possible framework would be a consortium of Independent schools that would offer evaluations and feedback to the SEC based on their experiences with educational reform. A possible framework for this consortium might include one representative from each of the Independent schools, separated into nine separate councils based on school level (elementary, preparatory, and secondary) and gender (boys-only, girls, only, co-educational). This would give school personnel a forum to discuss education with their colleagues at other Independent schools, and to provide recommendations and feedback to the SEC regarding school reform in Qatar. When administrators and teachers perceive their input as valuable, they are less likely to exit the educational system, thus reducing attrition.

CONCLUSION

We began by discussing the complex learning climate in Qatar. We have seen considerable variation across school types (Independent versus

other schools) and within these types. Coming relatively early in the reform process, the QES is uniquely situated to provide valuable feedback about the process of reform to this date. We focused on four policy-relevant areas and find both signs of encouragement and areas that require more work. Among the encouraging signs are:

- High levels of participation in and satisfaction with teacher professional development programs.
- Teachers and administrators have relatively positive feelings about each other and believe that they are working together as a group to further education in Qatar.
- Efforts to improve communications between parents and the schools appear to be working as a large percentage of parents both report receiving regular learning reports about their child and express satisfaction with communications with the schools.

While progress has been made, we find some areas require additional attention. Chief among these are:

- Student motivation remains a problem, particularly in the Independent schools. Administrators and teachers at Independent schools are less satisfied with student motivation than their colleagues at other schools and their dissatisfaction is borne out by relatively high levels of student motivational problems.
- Students' educational aspirations are high but many are uncertain about their ability to complete secondary school. This is particularly problematic for students whose parents have lower levels of education.
- Over twice as many students in private schools plan on a career in the knowledge economy field as do students in Independent schools, and many of their educational plans will limit their ability to find a high-level knowledge economy career.
- Much work remains to involve parents in the education process both within their homes and in the schools. Parents report relatively low levels of participation in selected school activities and teachers and administrators are not satisfied with parental efforts.
- Teachers feel less involved in school decision-making than administrators believe they are, and both teachers and administrators feel undervalued by the SEC.

Many of the recommendations outlined in this report are based on programs conducted outside of Qatar. As such, they are context-specific and will need to be modified to be effective. We encourage the SEC to consider selecting one or two pilot schools before implementing system-wide changes. We would also encourage the SEC to include a full external evaluation into the implementation plan that includes both summative and formative components. The summative portion of the evaluation would measure key outcome measures (such as student plans for a career in the knowledge economy along with plans for the appropriate level of education) at multiple points in time (for example, before the pilot begins, midway through the pilot, immediately after the pilot concludes, and three and six months after the pilot ends). The formative evaluation would monitor whether the program is being implemented as planned and identify any problems with the implementation. SESRI welcomes the opportunity to serve in an advisory role should the SEC and related policymakers seek to implement the recommendations in this report.

This is an exciting time for K–12 education in Qatar, and SESRI considers itself fortunate to be a witness to the reforms. While this report highlighted some limitations perceived by participants in K–12 education, we see many positive developments, especially in terms of educator professional development, the teacher-parent relationship, and teacher-administrator relationships. Future reports from the QES will focus on areas with direct relevance to education reform in Qatar to include, for example: (1) the use of multimedia technology in the schools; (2) student engagement in school and extracurricular activities; and school facilities. As educators and parents, we at SESRI care that the education system exceeds the targets outlined in the NDS so that Qatar attains a modern world-class education system comparable to any offered around the world (QNS 2030 p. 13). With this shared vision of the future, we believe it is possible to reform education in Qatar so that each child has the best chance possible for a successful and rewarding career in an ever-changing globalized society.

APPENDIX A:
SURVEY METHODOLOGY

Results from the Qatar Education Study (QES) come from four surveys administered under the direction of the Survey Operations Division at the Social and Economic Survey Research Institute (SESRI). The surveys

were sent to central stakeholders in K–12 education: students, parents, teachers, and administrators. Feedback from these stakeholders is critical to evaluating whether the reforms implemented in fulfilment of the targets outlined in the Qatar National Development Strategy 2011-2016 (NDS) are succeeding, and if not, which reforms may need reevaluation and additional support from the Supreme Education Council (SEC). This survey design is especially appropriate because it paints a clear picture of the participants' school experience.

Sample design

Sampling is the process of selecting those individuals from a population to estimate characteristics of the whole population. It plays a critical part in any school survey since the ability to make valid inferences to the population, which is the target of the investigation, relies upon a rigorous sample design. In the following, we discuss issues related to the sampling design used in the QES.

Students were the target population for the survey sampling. The sampling frame, which is a list of all those individuals in a population who can be selected, was developed by SESRI based on a comprehensive list of all public and private schools in Qatar which was provided by the Supreme Council of Education. In this frame, all schools are listed with information about school names, addresses, school gender (boy, girl, or coed), system (independent, international, private, or another type of school), and the number of students in grade 8, 9, 11, and 12.

Based on the information about the school size, school system, gender and grade, we divided the sampling frame into several subpopulations (i.e., stratum). This stratification divided members of the population into subgroups that are relatively homogenous before sampling begins. We tried to ensure that every member of the population had the same probability of being selected (i.e., self-weighting) so proportionate sampling was used to make the proportion of students in each stratum similar between the frame another typed the sample. That means the number of sampled schools needed to be proportionate to the number of respondents across strata in the frame (assuming that the same number of students was selected from each school).

Inside each stratum, students were randomly selected following a two-stage sampling process which is probably the most commonly used sample design in educational research (UNESCO International Institute

for Educational Planning 2009). In the first stage, the school was selected with probability proportionate to its size (i.e., PPS). This gives an equal chance of selection for students while allowing for a similar number of students to be chosen from each school for each strata. In the second stage, for ease of the fieldwork, we randomly selected one class for each grade in the school ,and all students in the class were included in the survey.

In the student study, students in grades 11 and 12 in the secondary schools and students in grades 8 and 9 in the preparatory schools were selected. For the parent study, the parents of the students selected in the student study were sent questionnaires. Lead teachers of the classrooms selected for the study were sent questionnaires as were the administrators for the school.

We account for the complex sampling design in the data analysis to ensure the unbiasedness and efficiency of the statistical estimates. Particularly, a weighting variable was created to take into account the selection probability and the non-response. Weighting is a mathematical correction used to give some respondents in a survey more influence than others in the data analysis. This is sometimes needed so that a sample better reflects the population under study. In the QES, the number of students in the selected class can be different across schools, and weight is needed to adjust for this difference.

Sample size, non-response, and sampling error

The sample size of this survey is 43 schools. However, 4 schools refused our survey requests. For the remaining 39 surveyed schools, all students in the selected classes fully participated in the survey. In the final data, we have 1,848 students, 1,472 parents, 572 teachers, and 318 administrators from these 39 schools.

With the above number of completions, the maximum sampling error for a percentage is +/-2 percentage points for the student survey. The calculation of this sampling error takes into account the design effects (i.e., the effects from weighting, stratification, and clustering). One possible interpretation of sampling errors is: if the survey is conducted 100 times using the exact same procedure, the sampling errors would include the "true value" in 95 out of the 100 surveys. Note that the sampling errors can be calculated in this survey since the sample is based on a sampling scheme with known probabilities. This feature of random sampling is an

essential element that distinguishes probability samples from other sampling methods, such as quota sampling or convenient sampling.

Questionnaire development

The questions were designed in English and then translated into Arabic by professional translators. After the translation, the Arabic version was carefully checked by researchers at SESRI who are fluent in both English and Arabic. Next, the questionnaire was tested in a pre-test of four randomly selected schools.

This pretest gave valuable information allowing us to refine question-wording, response categories, introductions, transitions, interviewer instructions, and interview length. Based on this information, the final version of the questionnaire was created and then programmed for data entry purposes. The questionnaires were sent to stakeholders in December 2012. Parents of the students who received the student questionnaire were also sent the parent questionnaire to be completed at home. Data were collected from teachers and administrators through interviews conducted in their respective schools.

Survey Administration

Each interviewer participated in a training program covering the fundamentals of school survey, interviewing techniques, and standards protocols for administering survey instruments. All interviewers practiced the questionnaire before going to the schools. In general, interviewers were expected to:

- Locate and enlist the cooperation of schools and students.
- Motivate teachers and students to do a good job.
- Clarify any confusion/concerns.
- Observe the quality of responses.

Data were collected from students and parents using paper questionnaires (Paper-and-Pencil Interviewing– PAPI). Teachers and administrators from the selected schools were interviewed by SESRI fieldworkers using Computer-Assisted Personal Interviewing (CAPI).

Data Management

After data collection was completed, interviewers manually entered responses from students and parents into Blaise, which is a computer-

assisted interviewing system and survey processing tool. The responses were then merged into a single Blaise data file. This dataset was then cleaned, coded and saved in STATA formats for analysis. After weighting the final responses, the data were analyzed using STATA 12 and IBM SPSS 20, both of which are general purpose statistical software packages commonly used in the social sciences. Tables and graphs were generated in Microsoft Excel.

ENDNOTES

1 Most recent announcement available at Qatar Tribune: http://www.qatar-tribune.com/data/20130516/pdf/main.pdf 2 The Qatar National Vision 2030 (QNV 2030) is available at: http://www.gsdp.gov.qa/portal/page/portal/gsdp_en/qatar_national_vision/qnv_2030_document/QNV2030_English_ v2.pdf

3 Quoted from the General Secretariat for Development Planning 2008 and accessed at www.planning.gov.qa.

4 The Qatar National Development Strategy 2011-2016 (NDS) is available at: http://www.gsdp.gov.qa/gsdp_vision/docs/NDS_EN.pdf

5 The Education and Training Sector Strategy 2011-2016 (ETSS) of the SEC is available at: http://www.sec.gov.qa/en/about/documents/stratgy2012e.pdf

6 There is a strong literature in both the United States and other countries documenting educational disparities between students whose parents have a college education and those who do not. For example, an analysis of data from 20 nations that participated in the Program for International Student Assessment (PISA) finds that students with at least one parent with a post-secondary education had higher mathematics achievement scores than did students without a college-educated parent (Gillian Hampden-Thompson and Jamie S. Johnston. 2006. "Variation in the Relationship Between Nonschool Factors and Student Achievement on International Assessments." Statistics in Brief, Institute of Education Sciences, National Center for Education Statistics, NCES 2006-014). Within the United States, a study using data from the Beginning Postsecondary Students Longitudinal Study (BPS) finds that students whose parents did not have a college education had lower educational aspirations and lower college entrance scores (Debbie Hahs-Vaughn. 2004. "The Impact of Parents' Education Level on College Students: An Analysis Using the Beginning Postsecondary Students Longitudinal Study 1990-92/94." Journal of College Student Development, 45(5): 483-500). An analysis of data from the Longitudinal Study of American Youth finds that initial enrollment in college is strongly influenced by parent and home factors. The children of less educated parents were less likely to enroll in college which automatically disqualified them for employment at the professional level in the knowledge economy (or STEMM field in the article). Highly educated parents were more likely to encourage their children to learn about science overtly and indirectly through science-related books, materials, and toys (Jon D. Miller and Linda G. Kimmel. 2012. "Pathways to a STEMM profession." Peabody Journal of Education 87: 26-45).

7 The QES includes a question about the highest level of education of the student's mother and father in both the student and parent questionnaires. Examining gender differences in the effect of mothers and fathers on selected student outcome measures is beyond the scope of this report. Instead, consistent with many education and sociology policy-relevant studies, we measure parent education as the highest level of education of either parent, taking first the parental report, and then filling in missing data with the student report.

8 A target of education reform in Qatar is to enhance the professional capacity of teachers and workers in K–12 education (NDS p129-130). While Independent school teachers are less likely to have a degree or certificate in education than personnel at other schools, they are participating at high rates in professional development programs and report high levels of satisfaction with the programs. Additionally, both teachers and administrators overwhelmingly agree that teachers attend professional development programs to improve their skills and not to get away from school.

9 All survey questionnaires are available upon request. Please email sesri@qu.edu.qa.

10 Student motivation is a complex, multidimensional concept that is measured in a variety of ways ranging from single items to lengthy questionnaires. We focus on student attitudes and behaviors that demonstrate poor motivation and that may hinder academic success. These items in the QES are closest to Martin's Maladaptive Behavioral Dimensions of motivation (Andrew J. Martin. 2007. "Examining a Multidimensional Model of Student Motivation and Engagement Using a Construct Validation Approach." British Journal of Educational Psychology, 77: 413-440).

11 The count of indicators of poor student motivation assigns one point to a student for each of the following: (1) coming to school late three or more days in the past four weeks; (2) being absent from school two or more days in the past week; (3) feeling bored most of the time when at school; and (4) strongly or

somewhat agreeing that they do not put their maximum effort into studying. We classify students with two or more of these characteristics as having chronic motivation problems.

12 There is considerable variation across schools: the percent of students with no motivational problem behaviors in Independent schools ranges from a low of only 2 percent of the students to a high of 35 percent of the students.

Within the other schools, the percent ranges from a low of 19 percent to a high of 78 percent.

13 Furthermore, girls and boys are virtually identical in these motivational problems, as are secondary and preparatory students. Differences in parent education between the Independent schools and other schools do not explain these differences. In the Independent schools, the percent of students exhibiting none of these motivational problems is virtually identical whether or not their parents have a college degree. In the other schools, 44 percent of the students whose parents have a college degree exhibit none of these behaviors but 31 percent of whose parents do not have a college degree have no problem behaviors.

14 Students that used private tutoring were asked: What are the main reasons you use private tutors? (Select the two most important reasons): (1) To pass the exams, (2) Teachers do not explain the material well, (3) Teachers do not help students in class, (4) My classmates use private tutors, (5) Using private tutors is a sign of wealth, and (6) My friends advised me to use private tutors.

15 Alexandra Usher and Nancy Kober. 2012. Student Motivation – An Overlooked Piece of School Reform. Graduate School of Education and Human Development. Center on Education Policy, The George Washington University, Washington, DC. http://www.cep-dc.org/displayDocument.cfm?DocumentID=405

16 There are numerous articles reviewing exemplary programs to enhance student motivation and by extension, their educational outcomes. For example, Reynolds (1998) reviewed early child interventions to enhance educational outcomes and finds eight principles of effective programs: (1) target children and families who are most vulnerable to school difficulties; (2) begin participation early and continue to second or third grade; (3) provide comprehensive child development services, including parent development programs in the school and home; (4) active and multi- faceted parent involvement including volunteering in the classroom and going on field trips, attending workshops and interacting with other parents, providing for the child's educational needs at home, accepting home visits from school personnel, and completing educational requirements themselves; (5) a child-centered curriculum approach;

(6) small class sizes and teacher-student ratios; (7) regular staff development and in-service training; and (8) systematic evaluation and monitoring (A.J. Reynolds. 1998. "Developing Early Childhood Programs for Children and Families at Risk: Research-Based Principles to Promote Long-Term Effectiveness." Children and Youth Services Review, 20: 503-523). Fashola and Slavin (1997) reviewed effective, replicable programs targeted to vulnerable elementary and middle school students. Although their vulnerable student population includes schools serving low-income or minority youths, these factors are also associated with low levels of parent education. One program with proven success in multiple sites is the Success for All (reading, writing, and language arts) program (http://www.successforall.org/) and the associated Roots and Wings (mathematics, social studies, and science). The programs incorporate such features as one-on-one tutoring for children with difficulties, regular professional development for teachers, and comprehensive family help and involvement (Olatokonbo S. Fashola & Robert E. Slavin. 1997. "Promising Programs for Elementary and Middle Schools: Evidence of Effectiveness and Replicability." Journal of Education for Students Placed at Risk, 3: 159-183). A small pilot program randomly assigned 40 high school students with such motivational problems as chronic absenteeism to a control and intervention. The intervention reduced absenteeism and increased educational aspirations at the end of five months. The intervention incorporated such features as daily phone calls to the home before school, a moral issues class, and participation in after-school athletic clubs (John N. Marvul. 2012. "If You Build It, They Will Come: A Successful Truancy Intervention Program in a Small High School." Urban Education 47: 144-169).

17 In addition to increasing higher education enrollment overall, a key performance indicator of Qatar education reform is to enroll greater numbers of male Qataris in higher education (ETSS p. 20-21). Based on the reports from

students in the QES, a gender difference persists for Independent school students. A greater percent of girls (71 percent) plan to obtain a university degree than boys (58 percent). This gap is narrower and reversed for non- Independent schools: 72 percent of boys and 67 percent of girls plan on obtaining a university degree. The reasons for this gap are multi-layered and beyond the scope of this report. However, tables, figures and charts detailing the gender gap are available upon request.

18 The knowledge economy is defined as a career in science, technology, engineering, mathematics, and medical professions.

19 Many Qatari students are opting out of careers in the knowledge economy entirely. Setting aside their educational plans, only 14 percent of Qatari national students plan on a career in the knowledge economy (versus 46 percent of non-Qatari students). The remaining careers the students expressed an interest in are business, administration, and legal careers (36 percent Qatari, 19 percent other), military and the police (24 percent Qatari, 7 percent other), education (6 percent Qatari, 4 percent other), transportation and service (2 percent Qatari, 6 percent other), and arts, entertainment, and sports (2 percent Qatari, 6 percent other). An additional 17 percent of Qatari students and 12 percent of other students are uncertain as to what career they would like to have.

20 Students were asked whether they strongly agreed, somewhat agreed, somewhat disagreed, or strongly disagreed with three statements about four classes (mathematics, English, Arabic, and science). Students expressed generally positive feelings about all four subject areas. With regard to the statement, "I usually look forward to [name of subject] classes," 71 percent of Independent students and 80 percent of other students agree about math class, 79 percent of Independent students and 86 percent of other students agree about science class, 81 percent of Independent students and 83 percent of other students agree about English class, and 78 percent of Independent students and 63 percent of other students agree about Arabic class. When asked for their level of agreement with the statement "[name of subject] will be useful for my future," 73 percent of Independent students and 91 percent of other students agree about mathematics, 80 percent of Independent students and 92 percent of other students agree about science, 90 percent of Independent students and 95 percent of other students agree about English, and 80 percent of Independent students and 70 percent of other students agree about Arabic. There is strong evidence in survey research of the tendency of respondents to agree, or acquiesce, when uncertain about a response (see, for example, J.A. Krosnick and L.R. Fabrigar LR. 1998. Designing Good Questionnaires: Insights from Psychology.

New York: Oxford Univ. Press) Thus, it is not surprising that slightly fewer students disagreed with the statement "I am often afraid of asking questions in [name of subject] classes." However, despite the tendency to acquiesce, 56 percent of Independent students and 66 percent of other students disagree about being afraid to ask questions in math class, 61 percent of Independent students and 74 percent of other students disagree about science class, 61 percent of Independent students and 74 percent of other students disagree about science class, and 66 percent of Independent students and 85 percent of other students disagree about Arabic class.

21 The College Board report can be found at: http://advocacy.collegeboard.org/sites/default/files/10b_2217_EightComponents_WEB_100625.pdf . Additional information, as well as suggestions for applying each of the components to students, teachers, counselors, families, and the schools, can be found at: http://nosca.collegeboard.org/eight-components.

22 See, for example, Alberto F. Casbrera and Steven M. La Nasa (2000). "Overcoming the Tasks on the Path to College for America's Disadvantaged." New Directions for Institutional Research, 107: 31-43.

23 National Academy of Sciences. 2011. Expanding Underrepresented Minority Participation: America's Science and Technology Talent at the Crossroads. Washington, DC: The National Academies Press. The report is available at: http://www.nap.edu/catalog/12984.html

24 http://www.sec.gov.qa/En/Media/News/Pages/NewsDetails.aspx?NewsID=3324

25 A number of articles detail the success of various programs designed to increase student interest in a career in a knowledge economy (or STEM) career. For example, Shuen et al. (2011) detail a one-day program offered for girls to encourage their interest in a career in science, engineering, or technology. They find that girls who attend the program two years in a row have a substantial interest in a STEM career, and recommend longer-term programs as

well as one-week programs in the summer (Jessica A. Shuen, et. A. 2011. "FEMMES: a One-Day Mentorship Program to Engage 4th-6th Grade Girls in STEM Activities." Journal of Women and Minorities in Science and Engineering 17(4): 295-312). Oregon State University has a series of programs involving undergraduate science majors with students in area K–12 schools. The programs have the advantage of encouraging the college students to remain in a STEM field while exciting the K–12 students in the sciences (Sujay Rao, Devorah Shamah, and Ryan Collay. 2007. "Meaningful Involvement of Science Undergraduates in K–12 Outreach." Journal of College Science Teaching May/June 36: 54-58). Another program found an increase in interest in a STEM career after showing middle school students a series of video interviews with scientists (Vanessa L. Wyss, Diane Heulskamp, and Cathy J. Siebert. 2012. "Increasing Middle School Student Interest in STEM Careers with Videos of Scientists." International Journal of Environmental & Science Education 7: 501-522). An extensive list of programs funded by the NSF to encourage interest in a career in science, engineering, and technology at all academic levels can be found at: http://stepcentral.net/projects/ .

26 University of Massachusetts Donahue Institute. 2011. Increasing Student Interest in Science, Technology, Engineering, and Math (STEM): Massachusetts STEM Pipeline Fund Programs Using Promising Practices. Hadley, MA. The report can be found at: http://www.mass.edu/forinstitutions/prek16/documents/Student%20Interest%20Summary%20Report.pdf

27 Numerous studies conducted around the world have found parent involvement – sometimes referred to as social capital – to be critical for a variety of short-term and long-term educational outcomes. A 2010 study using data from the Netherlands found that parent reading behavior and discussions of books with their children had a positive effect on their child's educational outcomes (N. Notten and G. Kraaykamp, 2010. "Parental media socialization and educational attainment: Resource or disadvantage?" Research in Social Stratification and Mobility 28: 453-464).

Another study comparing the influence of family on mathematics scores in Canada, Japan, and the United States found strong family influences in all three countries (C. Bassani. 2006. "A test of social capital theory outside of the American context: Family and school social capital and youths' math scores in Canada, Japan, and the United States." International Journal of Educational Research, 45: 380-403).

28 Dufur, Parcel, and Troutman (2013) used data from the U.S. National Longitudinal Education Study and find that social capital in the family is more influential than social capital in the school. The measures of family social capital included such factors as students discussing various school issues with their parents, parents checking their child's homework, parents attending school meetings, and parents attending school events (Mikaela J. Dufur, Toby L. Parcel, Kelly P. Troutman. 2013. "Does capital at home matter more than capital at school? Social capital effects on academic achievement."Research in Social Stratification and Mobility 31: 1-21.) Additional information can be found about the study at: http://news.ncsu.edu/releases/wms-parcel-parents/.

29 The Qatar University pilot program on "Reading Together for Qatar" is a step toward improving reading and literacy among younger school age children (http://www.qatarisbooming.com/2013/03/12/qatar-university-launches-

%E2%80%9Creading-together-for-qatar%E2%80%9D-volunteering-project/). Models exist in other nations to expand such programs to the family to enhance the children's learning experiences. Sylva et al describe a successful program in the U.K. designed to help parents improve their young children's literacy and ameliorate behavioral problems (Kathy Sylva et. al. 2008. "Training Parents to Help their Children Read: A Randomized Control Trial." British Journal of Educational Psychology 78: 435-455.) A joint pre-school and home program taught parents how to teach children to read and increased the literacy skills of young children in the United States (Andrea A. Zevenbergena,, Grover J. Whitehurst, and Jason A. Zevenbergen. 2003. "Effects of a shared-reading intervention on the inclusion of evaluative devices in narratives of children from low-income families." Applied Developmental Psychology 24: 1-15). There are numerous models of simple activities developed by various educational groups to help parents incorporate more learning activities (particularly in science and math) into their routine interactions with their children. Many of these examples could serve as models for efforts in Qatar to help involve parents with their children's education. Internet4Classrooms http://internet4classrooms.com) has basic help for parents in a variety of subjects at all grade levels and might serve as a model for resources that could be provided to parents in Qatar. The Institute for Educational Initiatives developed a brochure for parents to help them integrate science and mathematics into their everyday activities with their children. The brochure could serve as a model for activities that parents in Qatar could engage in with their children: http://iei.nd.edu/assets/78208/parents_guide_high_res.pdf .

Similarly, math.com offers a series of simple activities that could be taught to parents of children beginning at a young age to incorporate more math and science into their lives outside of school

http://www.math.com/parents/articles/pnew797h.html

30 See endnote above.

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INTRODUCTION

The leadership of Qatar is greatly invested in its K–12 education because it views education as the key to the nation's economic and social progress. To this end, the Father Emir, His Highness Sheikh Hamad Bin Khalifa Al-Thani, announced a sweeping education reform in 2002 – Education for a New Era (EFNE) – to enhance educational quality and renewed this commitment in 2013 with a 360 billion riyal health and education fund.[ii] His Highness Sheik Tamim bin Hamad Al Thani has continued this priority because he recognizes the value of a highly trained and educated population. Even with a well-developed public education system, few Qataris before 2002 were qualified for positions that could fully meet the demands of the economic, social, and cultural changes underway in the country, not to mention the challenges of a global economy. To transform Qatar into a diversified and advanced knowledge economy, the leadership prioritized a complete overhaul of the public school system. Following quickly after the 2002 announcement, the Supreme Education Council (SEC) opened the first cohort of independent schools in 2004[iii]. Each fall thereafter another cohort of independent schools was opened until in September 2010 Qatar achieved the goal of converting all Ministry schools to Independent schools.

In 2008, following years of comprehensive planning and analysis, the state of Qatar articulated long-term national goals and values in the Qatar National Vision 2030 (QNV 2030)iv, which sets the framework for growth and development, mainly through advanced, high quality educational and training services. In fulfillment of this mission, the QNV 2030 "aims to build a modern world-class educational system that provides students with a first-rate education, comparable to that offered anywhere in the world." [v] The Qatar National Development Strategy 2011-2016 (NDS)vi outlines the targets for achieving the goals in the QNV 2030, and the Education and Training Sector Strategy 2011-2016 (ETSS)[vii] of the Supreme Education Council (SEC) identifies the measurable outcomes and projects to prepare citizens for the future.

While the primary focus of education reform in Qatar is on curriculum and teaching methods to enhance student outcomes, the facilities available to students, and in which their education occurs is also important. The Qatar Public Works Authority (Ashghal) has as its mission to "deliver and manage state- of-the-art, sustainable world class buildings and infrastructure that fulfill the Qatar National Vision 2030.[viii]" The Ashghal website lists numerous school buildings either under construction or

renovation to improve facilities such as school cafeterias and sports venues.

This report examines the views of children, parents, teachers, and administrators toward K–12 education in Qatar. It is based on results from the Qatar Education Study (QES), which is a series of surveys conducted by the Social and Economic Survey Research Institute (SESRI) in December 2012. Together, the surveys included more than 4,200 participants from 39 preparatory and secondary schools. The following table has the details:

Table 4:Survey Sample

Total Number of surveyed schools	39 school	
	Independent Schools ***24 school***	**Other Schools** ***15 school***
Total number of surveyed students	**1848 student**	
	Independent Schools ***1158 student*** ***742 Qatari students***	**Other Schools** ***690 student***
Total number of surveyed parents	**1472 parent**	
	Independent Schools ***877 parent*** ***514 Qatari parents***	**Other Schools** ***595 parent***
Total number of surveyed teachers	**572 teacher**	
	Independent Schools ***384 teacher*** ***77 Qatari teachers***	**Other Schools** ***188 teacher***
Total number of surveyed school administrators	**318 admin**	
	Independent Schools ***205 admin*** ***109 Qatari admin***	**Other Schools** ***113 admin***

These surveys help capture attitudes on a number of issues pertaining to schools in Qatar from current participants in preparatory and secondary

education. The schools in the sample represent a cross-section of the major school types (e.g., Independent, private) and coeducational and single-gender programs. The design of the QES allows for comparison within groups (e.g. all students in grade 8 or 9) and makes it possible to examine an issue from the combined perspective of students, parents, and educators. Examining the attitudes of all members of the education system will assist in the development of future plans for education in Qatar.

Collecting and analyzing these data is a considerable undertaking, requiring SESRI to publish the results in stages. This report presents findings about four facilities available in the schools:

Science laboratories: More Independent school science teachers and administrators rate their school science laboratories as excellent as do their students.

Library: Nearly twice as many Independent school administrators and teachers rate their school libraries as excellent as do their students.

Sports facilities: More Independent school students rate their school's sports facilities as excellent as they do for any of the other school facilities.

Cafeteria: There is almost uniform dissatisfaction with the quality of food available in the Independent school cafeterias amongst students, teachers, and administrators.

The Qatar Education Survey (QES) provides a resource for policymakers with a variety of topics pertaining to how students, parents [ix], teachers, and administrators view the current education system. For this report we use information from the student, teacher, and administrator [x] questionnaires regarding four key facilities available in the schools Science laboratories, Library, Sports facilities and Cafeteria.

Teachers, administrators, and students were asked a series of questions about each of these four facilities. In the spring of 2014 school operators of the original schools in the QES were asked to complete a Supplemental Facilities Questionnaire (SFQ). The SFQ provides additional information about the four facilities as well as a general overview of the school buildings; we use the information collected in the SFQ to supplement the original data from the QES.

All but three of the Independent schools completing the SFQ are located in buildings constructed specifically for Independent schools, with nearly 80 percent only five-years old (built in 2007 or later) at the time the original QES was conducted. Two of the remaining Independent schools are located in buildings originally used as government Ministry schools, with the oldest having been constructed in 1996. The 13 other (non-

Independent) schools are housed in buildings that are generally older than those of the Independent schools, with only one built since 2007, and nine built before 2000.

Given the age difference in the Independent and other school buildings, it is not surprising that amongst the schools operators 42 percent from the other schools but only 25 percent from the Independent schools report plans in the next 12 months to make changes to the school building. Most of the changes scheduled in the Independent school buildings involve routine maintenance such as "maintenance of the building's roof" [xi] and "general maintenance and (to) arrange emergency exits for school labs." One of the other (non-Independent) schools is in the early stages of plans to build a new building, while two report plans to build additional classrooms.

In addition to planned building changes, the SFQ asked school operators, "If you had unlimited resources, what would you like to improve about the school building?" Seven Independent school operators had nothing else they would change about the building; with one writing that "the school is new and very good." The remaining Independent school operators suggested a variety of "ideal" changes they would like to make if resources were unlimited. Some school operators focused on functional changes such as "There should be an emergency door. Hire a maintenance technician" and the operator who would like "added rooms for storage." Several school operators would increase the number of facilities available for learning, as is evidenced by such responses as, "Increase the number of classrooms," " a lab for languages," and "provide labs for handicrafts."

We look at reports about each of these four facilities in depth throughout the remainder of this report, focusing on comparisons between school type, and within the Independent schools by student characteristics. However, while we display the distribution of selected responses by the four school types (Independent, international, Arabic, and Asian), we only test for significant differences between Independent and international schools. QES data are more limited for the Arabic schools (4 schools, 152 students) and Asian schools (2 schools, 118 students); as a result, any comparisons between Independent schools and the Arabic and Asian schools should be treated with caution.

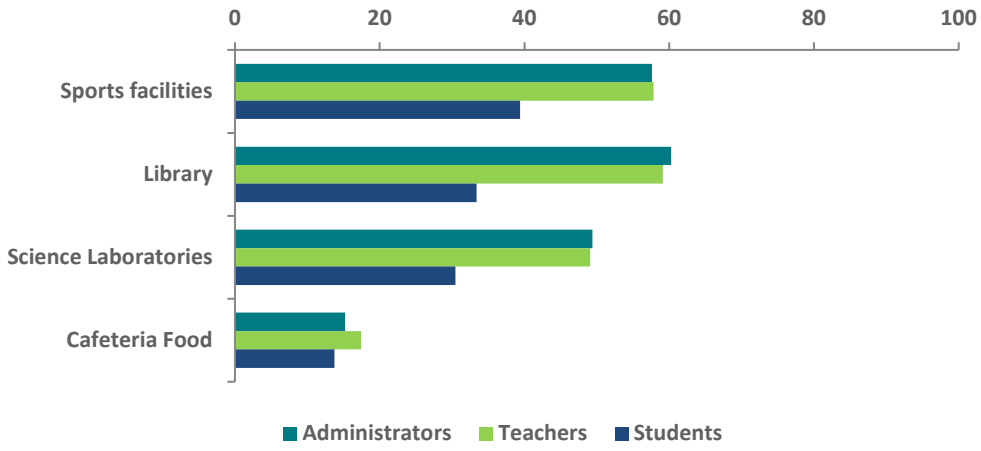
As a preview to the remainder of the report, a quick examination of Independent school staff and student ratings of the quality of the four facilities (rated as excellent, good, fair, and poor) is informative [xii.] There

is a general tendency in the Independent schools for administrators and teachers to assign higher ratings to each of the school facilities [xiii] than do students (see Figure 1). We might ask if the different respondents are simply rating all of the school facilities in the same manner – either as excellent, good, or even poor. This does not appear to be the case. Less than 10 percent of Independent school students assigned the same rating to all four facilities (with approximately four percent rating all four facilities as excellent), and approximately 30 percent assigning the same rating to three facilities.

Just one percent of the teachers assigned the same rating to all four facilities, and another 15 percent assigned the same rating to three of the facilities. In contrast, 19 percent of Independent school administrators used the same rating four times, and another 44 percent used the same rating three times, with 38 percent of the administrators rating three or more of the facilities as excellent.

Because the QNV aims to have first-class schools that are among the best in the world, we focus here and elsewhere on ratings of the quality of school facilities as being "excellent." While rating a facility as "good" may be acceptable in some circumstances, it does not equate to schools that are the best in the world.

Figure 7: Rating of four school facilities as Excellent by Independent school administrators, Teachers, and students



Nearly 40 percent of Independent school students rated the sports facilities in their schools as excellent and approximately one-third rated the school library and science laboratories as excellent (see Figure 1). Less than 20 percent of students, administrators, and teachers rated the quality of the food in the cafeteria as excellent. In the remainder of this report we will look at each of the four school facilities in depth. It will be useful to keep the relative rating of these four facilities in mind throughout the remainder of the report.

Science laboratories

Recently the State of Qatar has invested substantial resources into research and development, and while the infrastructure is in place, there is a shortage of citizens graduating from knowledge economy fields [xiv]. As such, one of the targets of the QNV 2030 is to enhance scientific research by increasing the proportion of science and math graduates (NDS, p. 143). While a first-class school science laboratory is not sufficient to ensure that more Qatari students will learn science and eventually take a place in the knowledge economy, without first class laboratories students cannot experience critical hands-on inquiry- based science experiences that motivate them to pursue a career in the knowledge economy [yxv].

In late 2012 the administrators in all but one of the schools in the sample – an Arabic school – reported that their school had science laboratories. Based on the SFQ, the modal number of science laboratories in Independent schools is three, with 19 of the schools having three science laboratories, three (all preparatory schools) having two laboratories, and two (one preparatory and one secondary school) having just one science laboratory. The number of science laboratories in the international schools ranges from one laboratory (two schools) to six or more laboratories (two schools).

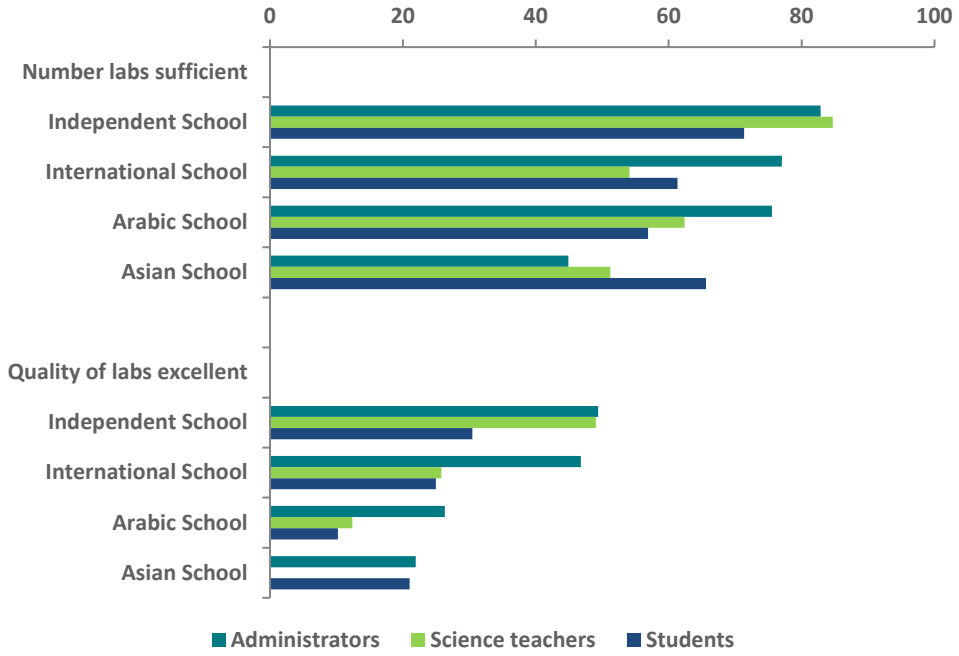
The QES asked students, administrators, and teachers to assess whether the number of science laboratories in their school is sufficient. Within the Independent schools, over 80 percent of administrators and science teachers, xvi and just over 70 percent of students feel the number of science laboratories in their school is sufficient (see Figure 2). Independent school science teachers were more likely to report their school had a sufficient number of science laboratories than science teachers in international schools. Independent school administrators and science teachers are more similar in their likelihood to report that the number of science laboratories is sufficient (correlation = .67) than students and administrators (correlation = .30) or students and science teachers (correlation = .22).

Independent school students are not uniform in their feelings about school science laboratories, with the percent of students within a school believing that the number of laboratories is sufficiently ranging from a low of 24 percent (one school) to a high of 85 percent (one school).

Administrators, teachers, and students are slightly less positive about the quality of the science laboratories in their school than they are about the

quantity of laboratories. When asked to rate the quality of science laboratories as either excellent, good, fair, or poor, approximately 50 percent of Independent school teachers and administrators rated the laboratories as excellent, while less than 30 percent of the Independent school students gave a similar rating (see Figure 2). This rating by students is statistically equivalent to international school students.

Figure 8: Evaluation of school science laboratories by students, teachers, and administrators

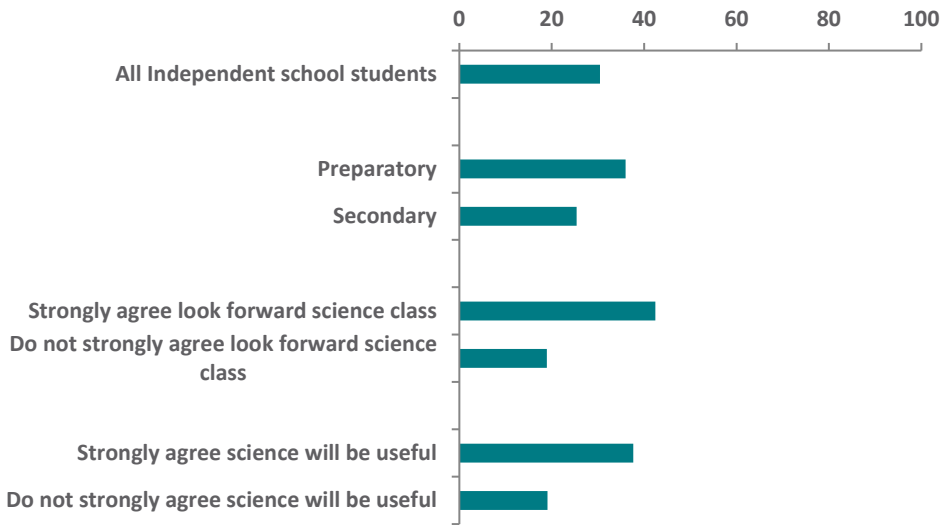


Looking just at Independent school students, there were no significant differences in the ratings assigned to the quality of science laboratories based on gender, parent level of education, the students' planned level of education, or their plans to obtain a job in the knowledge economy. There is a relationship between whether students look forward to their science classes and the rating they assign to the science laboratories, with over twice as many students who strongly agree with the statement "I look forward to science classes" rating the laboratories in their school as excellent in comparison to those who do not strongly agree with the statement (see Figure 3).

There is a similar relationship between students who strongly agree with the statement “Science will be useful for my future” and their evaluation of the science laboratories in their school. In a one-time study such as the QES, we cannot infer that it is the “excellent” laboratories that lead students to look forward to science classes or to believe that science will be useful to their future. It is equally likely that students who look forward to science class would have a tendency to rate the laboratories higher than students who do not look forward to science class. In order to untangle this relationship, we would need to track the students’ feelings about science and their ratings of their science laboratories over time.

There is considerable variance across the Independent schools in the percent of students rating their school’s science laboratories as excellent, from one school in which only six percent of the students rate the science laboratories as excellent to a high of 60 percent of the students. As was the case with the sufficiency of the number of laboratories, teachers and administrators in the Independent schools are more similar in their tendency to rate the laboratories as excellent (correlation = .62) than are the students and administrators (correlation = .36). However, in this case the students and science teachers are more closely aligned (correlation = .61).

Figure 9: Percent of independent school students rating the school science laboratories as excellent by selected characteristics



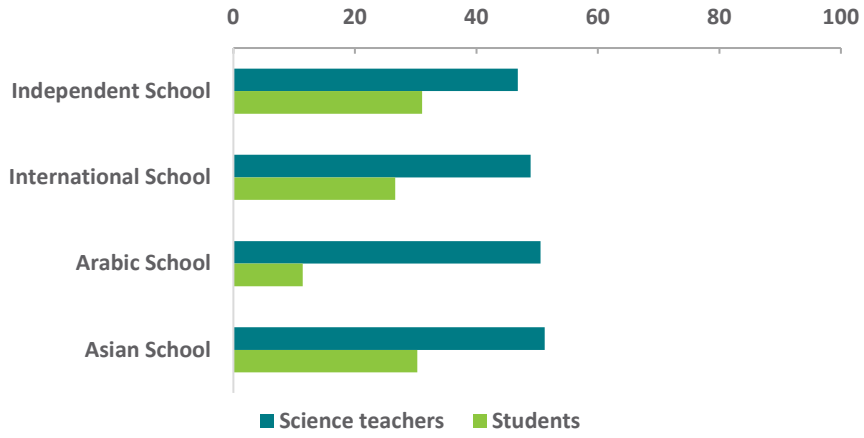
Given the key relationship between excellent science laboratories and the joint goals of providing a first-class education and encouraging more students to be interested in science, the fact that less than one-third of Independent school students rate the science laboratories as excellent is problematic. The SFQ supplements our knowledge about school science laboratories to learn more about the actual facilities, plans for the future, and current usage patterns. Two-thirds of the Independent school operators report that the laboratories in their schools are multiple-use laboratories, used for a variety of science subjects, while two-thirds of the international schools have single-use science laboratories.

Approximately three-quarters of both Independent and international school operators report that at least one science laboratory was built between 2007 and 2012.

When asked in the SFQ, “Are there any plans within the next twelve months to make changes to the science laboratories,” none of the international school operators responded affirmatively, while 11 of the 24 Independent school operators report plans to make changes. Three Independent schools plan to improve laboratory safety through such means as “Have external emergency doors for the labs.” In contrast, several Independent schools plan changes to enhance educational facets of the science laboratories. For example, one Independent school will “Put special stickers for the curriculum and buy some tools to make some important experiments in the curriculum and the survey of scientific experiments.” A second independent school plans to “Buy modern tools and equipment for the science course,” while a third school intends to “Create a miniature laboratory [Microbiology].”

Beyond planned changes to school science laboratories, the SFQ asked school operators, “If you had unlimited resources, what would you like to improve about science laboratories?” The answers provide some insights into how far from ideal school operators believe their science laboratories currently are. Eight Independent school operators describe nothing they would like to improve, with one stating that, “There is no shortage in the laboratory; everything is available.” The remaining Independent school operators discussed a number of desired improvements. Several school operators focused on purchasing additional, more modern equipment, such as the operator who wrote, “Provide the laboratory with modern equipment and glass tools for chemistry and physics.” Others focused on purchasing specific equipment such as the school operator who wrote, “Use of modern technology in the use of sensors, add a three- dimensional display in the presentation of some scientific experiments.” Similarly, another school operator would, “increase (number of) incubators (for) bacteria, acid tanks, (and) chemical compounds and increase some of the tools in the physics laboratory” while a third school operator would, “Create an electronic laboratory, create a virtual zoo.”

Figure 10: Percent Of Students Using Science Laboratories 2 Or More Times A Week, Students And Science Teacher Reports



Having a sufficient number of excellent science laboratories is necessary for high level hands-on- science experiences, but it is not sufficient. Students also need regular exposure to these high quality science laboratories. The QES asked both teachers and students how frequently they used the school science laboratories. A higher percentage of science

teachers across the four school types report that their students use science laboratories two or more times a week than do the students in the same schools (see Figure 4)xvii. Within the Independent schools, 47 percent of the science teachers, but only 31 percent of the students reported using the science laboratories two or more times a week. These reports vary widely across the Independent schools, and there is virtually no relationship between science teacher and student reports (correlation not statistically significant). In general, science teachers in each Independent school are more likely to report that their students use the science laboratories two or more times a week than are the students.

Beyond simply being in the science laboratories, it is important to know if the students merely watch their teacher conduct experiments, or if they are able to perform their own experiments, for an actual hands-on experience. An early evaluation of the implementation of ENF by the RAND Corporation found that "Laboratory activities intended to provide students with hands-on experiences all too often ended up as demonstrations by the teacher" (Zellman et al., 2009)[xviii]. In the SFQ we asked whether students conducted their own experiments under the supervision of a teacher, and if so, how many days a week they conducted these experiments.

All of the school operators report that students conduct their own experiments in the science laboratories under the supervision of a teacher. Independent school operators report a high level of this activity; nine of the school operators report students conduct their own experiment five days a week, and only five report students conduct experiments one or fewer days each week. In contrast, the modal response for international school operators is one day a week of science experiments.

Finally, closely connected with the science laboratories and directly related to the NDS goal of increasing the number of science graduates, the SFQ asked whether each school conducted any programs or activities to encourage students to be interested in science and consider careers in the Knowledge Economy. If they responded yes, they were asked to briefly describe these activities ix. Over 80 percent of both the Independent and international school operators report some programs or activities in their schools that encourage an interest in science.

Science-related competitions were mentioned by numerous Independent school operators as one way of promoting an interest in science. Several schools participated in the Al-Bairaq World program at Qatar University, a "non-traditional educational project carried out by Center for Advanced

Materials (CAM) at Qatar University, in which students in the final grade at Qatari independent secondary school work in teams with highly exquisite university-level scientists on practical scientific problems in authentic contexts. "[xx] Other school operators mentioned the Qatar National Robot Olympiad, a part of the GO-ROBOT program that aims to "foster interest and develop skills in science, technology, engineering and mathematics, helping children engage with complex engineering projects in a fun way." [xxi]

Some Independent school operators report a variety of activities designed to encourage an interest in science, such as the school that conducts, "group activities for science that relate to the application of scientific experiments and by visiting field laboratories for university and science club." A number of Independent schools have science clubs to encourage an interest in science and careers in the Knowledge Economy. One Independent school operator reports they have a, "Science Club for scientific activities to increase students' experiences and to motivate them."

Summary For Science Laboratories:

Having modern, fully-stocked science laboratories is critical to help Qatar attain its goals of increasing interest and achievement in fields critical to a career in the Knowledge Economy. The NDS notes that one of the key challenges facing Qatar's education system is "the underachievement of Qatari students in math, science and English language at all levels" (p. 124). The recent release of the 2012 PISA scores provides a mixed assessment of science education in Qatar[xxii]. While students in Qatar improved in their PISA science scores from 2006, the average science scores of 15-year old Qatari students remain below average when compared to students from around the world[xxiii]. Despite the emphasis of the NDS on Knowledge Economy fields, studies have found declines in enrollment in science at both the secondary and college-level[xxiv]. Based on the results of the QES and the SFQ, the following describes our recommendations to enhance the science laboratory experience.

First, following the lead of the international schools, we recommend that the Independent schools– at least at the secondary level – move to a model of single-use rather than multiple-use science laboratories. Numerous sources are available regarding the specific equipment for learning (both in the indoor and outdoor laboratories), storage, and safety needed for each subject area (e.g., biology, chemistry, physics)xxv and we urge that they be consulted in constructing single-use laboratories.

But having modern, world-class science laboratories is just a first step; a well-equipped, modern laboratory does not guarantee that students will learn and develop an interest in science. Having science teachers who fully understand and are able to incorporate student-centered learning is critical to successful inquiry-based science. Our second recommendation is to provide more intensive, lengthy training for science teachers at all levels on a regular basis, including classroom observations and regular feedback. Knight et al. (2014) found low levels of student-centered inquiry teaching in Qatar, despite an emphasis in the ENF on the creation of student-centered science (and mathematics) classrooms with inquiry-based learning[xxvi]." They suggest that given the long history of recitation and memorization in Qatari classrooms prior to ENF, science teachers may need long, intense mediation to help shift their teaching style to enhance inquiry-based learning.

Third, and related to the above recommendation, we urge regular monitoring and evaluation of the activities conducted in science laboratories. We see from the results of the QES and SFQ that most Independent school students appear to conduct their own experiments in the science laboratories on at least a weekly basis. But the quality and nature of these investigations must be examined more thoroughly. Simply having students conduct their own, "hands-on" investigations is not adequat[xxvii]. Student learning in science laboratories may be inhibited by such factors as: (1) the use of standard laboratory guides or activities that are simply a list of tasks for student to follow; (2) teachers serving a managerial function and failing to engage students in critical discussions of the reasons for their laboratory activities and the overarching purpose of their investigations; and (3) failure to test students abilities in the science laboratory and their understanding of the purpose of the laboratory investigations, and instead assessing solely on science concepts.[xxviii] (2004)

Library

The role of school libraries is changing and being challenged throughout the world as digital resources increase [xxix]. This is particularly relevant in Qatar. Initial information about the e-learning project of the SEC focused on making curricular materials directly accessible to Independent school students through the distribution of tablet computers. A late 2012 announcement about the launch of the E-Learning Portal communication

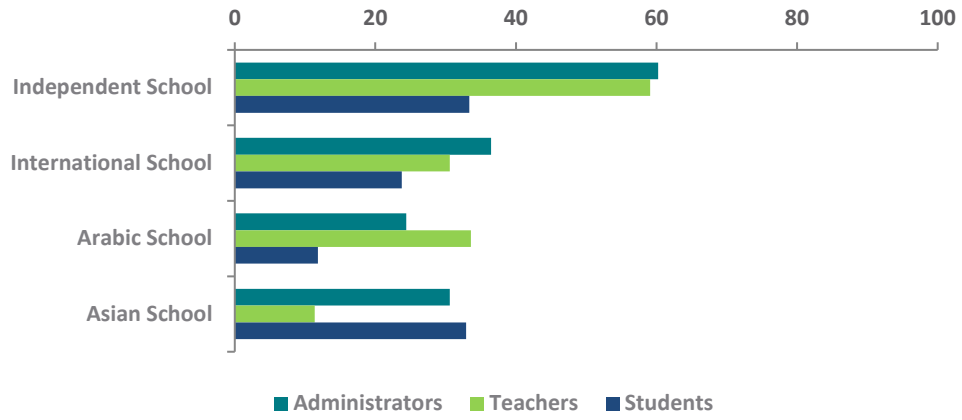
and electronic library indicated that the SEC will "begin to implement an interactive e- book project, which will replace the textbook during the five-year plan for the implementation of e- learning projects". [xxx] In juxtaposition, the SEC's recently released Annual Report on Education in Qatar Schools for the Academic year 2012-2013[xxxi] notes that the average number of books per student in Independent school libraries is 17.4 books.

We explore how students rate their library, and how frequently they use the library resources and consider the relationship between school libraries and the e-learning project.

In the SFQ school operators described their libraries in broad terms, referring to such things as the number of books available, the number of tables, and the number of computers, if any [xxxii]. For example, one Independent school's library was described in general as the "Number of resources available at the center 11,850, includes all the diverse sources, there are approximately 21 computers. 6 tables large enough size for six students, the center is divided into a private library of books and other sources and devices." A second Independent school library is described as containing: "11,000 books in various fields in addition to the media and electronic books. It also includes 9 computers, and a data display screen, and 12 tables."

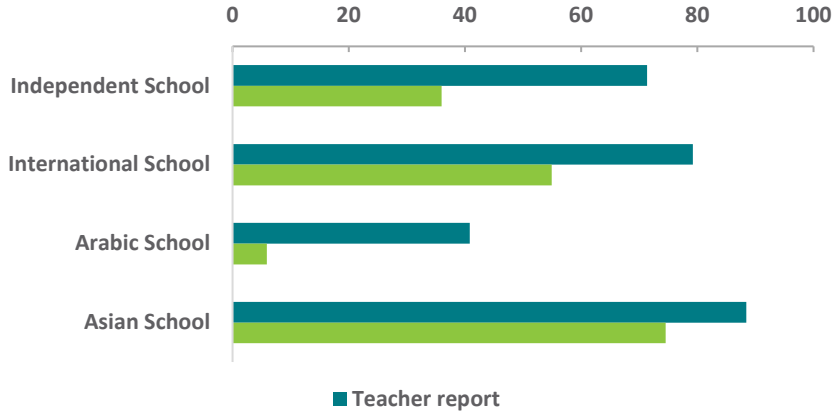
Approximately 60 percent of Independent school administrators and teachers rate their school library as excellent, nearly twice that of Independent school students (33 percent) (see Figure 5). Administrators in Independent schools are more likely to rate the library in their school as excellent (60 percent) than are administrators in international schools (37 percent). Independent school students are also more likely to rate their school library as excellent (34 percent) than are students in international schools (24 percent). However, there is no significant difference in the ratings of Independent and international school teachers.

Figure 11: Quality of school library rated excellent by students, teachers, and Administrators



In addition to teachers rating the quality of the school library as higher than do students, approximately twice as many Independent school teachers (71 percent) as students (36 percent) report that students visit the school library at least once a week (see Figure 6). The percent of Independent school teachers reporting weekly library use by their students is not statistically different from reports by international school teachers. Student reports of weekly library use is not uniform across the Independent schools, ranging from two schools in which less than 10 percent of the students report they use the library weekly to another school in which 85 percent of the students report weekly use.

Figure 12: percent of students using library at least weekly, reports from students and teachers



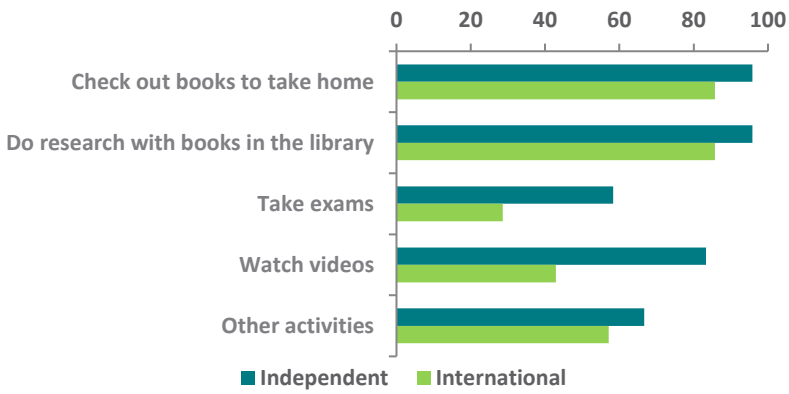
Which students report using the school library most frequently? Looking just at Independent schools, there is no difference between preparatory

and secondary students, parent education or student plans for their highest level of education. Boys are more likely to use the library at least once a week (48 percent) than girls (25 percent), and students who report doing additional reading outside of school are over twice as likely (48 percent) to use the school library at least once a week as are those who do no outside reading (21 percent).

Related to reports of library use, in the SFQ school operators were asked to rate how busy they believe their school library is, using a scale from zero to ten, where zero means it is never busy and ten means it is always very busy. On average, both the Independent and international school operators rated their school libraries as relatively busy, assigning a score of eight out of ten. Among the Independent schools, scores ranged from a low of three (one school) to a high of ten (four schools).

But what do the students do while in the library? Not surprisingly, activities traditionally associated with libraries – checking out books to take home and doing research with books in the library – are the most frequently reported activities by both Independent and international school operators (see Figure 7). Independent school students watch videos in over 80 percent of the schools and take exams in nearly 60 percent of the schools. When asked to describe the "other" activities that occur in the school library, Independent school operators listed such activities as library classes, reading classes, competitions, and crafts.

Figure 13: Percent of schools with selected activities in library, supplemental facilities questionnaires



Just under half of the Independent school operators report plans to make changes to the school library in the next twelve months[xxxiv]. A number of these planned changes in the Independent schools relate to electronic resources and the e-learning program. For example, one Independent school plans to "bind and activate the electronic library site with e-learning." Another Independent school will be "transforming the library into an electronic library," while a third plans the "adoption of electronic archiving." Other Independent schools intend to expand their offerings by such things as "adding a health section" and creating "special reading units and a special unit for entertaining reading; audio-visual library."

Setting aside planned changes, the SFQ asked school operators how they would like to improve their school's library if they had unlimited resources. The answers to this question give a sense of how far from ideal the school operators feel their library is. Seven of the Independent school operators offered no ways they would improve the library, even if resources were unlimited. The remaining 19 Independent school operators listed a variety of desired improvements. Many would expand the resources available in the library such as the Independent school operator who wrote, "Increase the number of books and electronic sources." Similarly, a second Independent school operator would "Add diversity in sources of books and information," while a third would "Increase the number of computers, diversifying the sources of electronic information."

The e-learning project is intricately connected with school libraries. Once implemented in a school, all students are given a tablet computer through which they have access to curricular materials, the internet, and a wealth of electronic resources. As such, these tablets have the potential to replace many resources available in school libraries. The SFQ included questions to learn more about early experiences with the e-learning project implementation.

By the spring of 2014, the e-learning project had been implemented in 19 of the 24 Independent schools, with 4 of the remaining 5 schools uncertain when it will be implemented [xxxv]. Among the 19 schools in which the program was implemented, only 7 encountered problems with the tablets. The problems include both technical issues related to the hardware and software as well as negligence by students. One school operator wrote they encountered "Hardware failure, lost, forgotten by the students, the problem of internet outages, damaged, consumed and destroyed." A second school operator wrote, "Screens break easily and are expensive." In addition to these technical problems, one school operator indicated

some parental dissatisfaction, “There is a problem in the lesson preparatory software, it is unable to save… and there is a problem in general in the website, also some social network websites are available which parents are not happy about.”

The majority of the schools allow the students to take the tablets home but there are limits placed on their use, both by the SEC and the schools. One school operator describes the purpose of the limitations as being, “in order to protect the students in order to improve the use of tablets.” One Independent school operator describes the limitations as follows, “No student can (go) onto the Internet at home except to go to Twitter and Facebook until 9:00 p.m., as well as the student cannot access by using teacher’s user.” Another school operator wrote that, “Some sites are blocked by the Supreme Education Council. Social networking sites were open, but after parent protests they were shut down.”

Summary For Library:

Based on information collected in the SFQ, it is clear that Independent school libraries are well-stocked with books and other resources. However, with the implementation of the e-learning project and the continued pace of technology transformation in Qatar, there is less and less need for schools to acquire more books and other physical resources. There is a need for highly qualified librarians that can teach students to sift through the ever-mounting information available on the web and how to become digitally literate. While the school operators in the SFQ list a number of “other” activities that occur in the school libraries (such as competitions and exams) they do not discuss training students to be digitally literate. We propose transforming the school library into a place where students acquire information science literacy and skills [xxxvi].

While the Digital Library Initiative in Qatar is focused on academic researchers (both students and professionals), it has developed a key strategy of use to the Independent schools. The DLI has found that researchers frequently encounter difficulties accessing online sources because of a lack of training. As a result, they intend to develop a consulting center to “assist the public to efficiently and effectively find, access, and use a variety of information sources to meet their needs [xxxvii]” (p. 72). We recommend that school libraries replicate this idea and in addition to having a section devoted to consulting about online sources, routinely offer classes and sessions designed to enhance digital literacy.

Moreover, since several school operators mentioned parental concerns regarding the e-learning project and their children's access to various websites via the tablets, we recommend the schools increase their communications with parents about the e-learning project. Parents should be regularly updated through such means as demonstrations of the tablets and workshops designed to provide them with more knowledge about the various features of the e-learning project.

Sports Facilities

While not directly linked to student academic outcomes, school sports facilities are intricately connected to the QNV 2030 human development pillar and its emphasis not only on education, but healthcare. A key component of the healthcare goal is increasing preventive healthcare in Qatar. The Qatar National Health Strategy 2011-2016 (QNHS) notes that "Qatar is faced with critical public health challenges, with over 60% of deaths caused by chronic diseases, injuries, and congenital diseases, driven by risk factors that are largely preventable. A shift in the current healthcare system's focus from management of acute illness to more proactive prevention and early detection of ill health will be crucial to the success of the NHS" (p.

23).[xxxviii] The Third National Human Development Report (TNHDR)[xxxix] finds that "studies of secondary school Qatari students indicates alarming levels of overweight and obesity of up to 70% and 45% respectively, particularly among children in secondary school. Unhealthy eating and poor exercise habits ingrained early in life can lead to chronic noncommunicable diseases such as cardiovascular disease, diabetes and cancers in later life" (p. 3).

The TNHDR stresses that sports and physical activity can encourage youth to change their behaviors and lead a healthier lifestyle, and notes that in 2007 the SEC began a program to build sports capacities in the schools. Physical education is now compulsory in all Independent schools from kindergarten through 12th grade. A number of initiatives have been launched in Qatar to emphasize the need for a healthy lifestyle. In 2012 Weill Cornell Medical College, in association with the Supreme Council of Health, launched the Sahtak Awalan Your Health First campaign, a five-year, multi-stage program, with the first stage based on, "introducing Qataris to issues related to public health, particularly healthy practices and the importance of physical activity and diet" [xl] More recently, the Qatar Foundation in January of 2014 funded a five-year pilot program in which approximately 2,500 of Qatar's most overweight children will attend an intensive two-week camp followed by three months of after-school clubs. In September of 2014 the Qatar Active Schools program will begin implementation with a goal of increasing physical activity of Qatari children by 20%[xli].

The SFQ included a series of questions designed to provide additional information about the types of sports facilities available in the schools and the range of activities offered at each school [xlii]. All of the schools indicated

that they have some sports facilities, but the types of facilities and activities offered vary across the schools. Most of the Independent school operators described the availability of both indoor and outdoor sports facilities, with such phrases as, “Indoor and outdoor playgrounds, playgrounds for football, basketball, volleyball and handball” and “Multi-purpose hall, outdoors playgrounds :basketball, handball volleyball, football” and “Sports Hall, volleyball court, tennis court, handball court, basketball court.”

Both the Independent and international schools offer on average six different sports activities, ranging from a low of four sports (four Independent schools and two international schools) to a high of nine sports (two Independent schools and two international schools). Handball and basketball are offered in all of the Independent schools while football is offered in all but one of the schools (see Figure 8).

Athletics – a combination of track and cross-country running – is the most common of the “other” sports described by Independent school operators. Most of the “other” sports offered in the Independent schools meet the requirements of the TNHDR for increasing physical activity amongst Qatari youth. However, a few sports activities offered including billiards (2 Independent schools) and table tennis (3 Independent schools) are at a lower level of activity and it is questionable if they will help attain the goals set forth in the TNHDR.

Figure 14: Percent of schools offering selected sports activities, supplemental facilities questionnaires

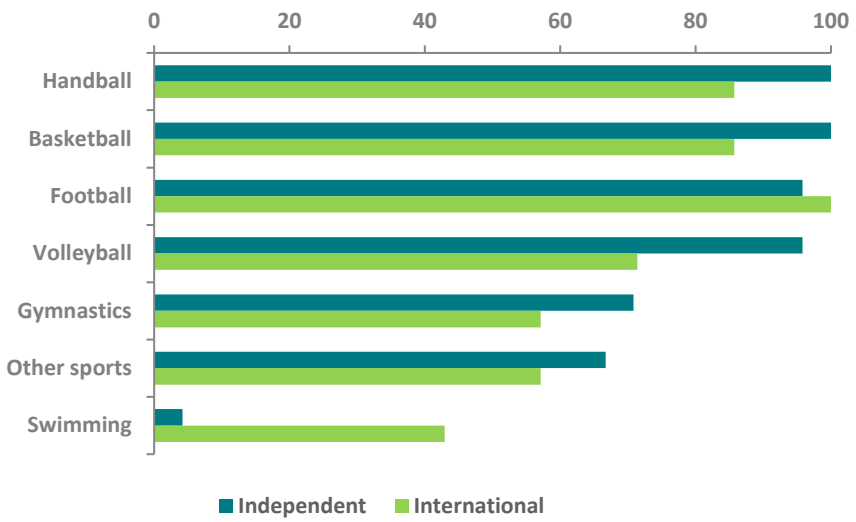


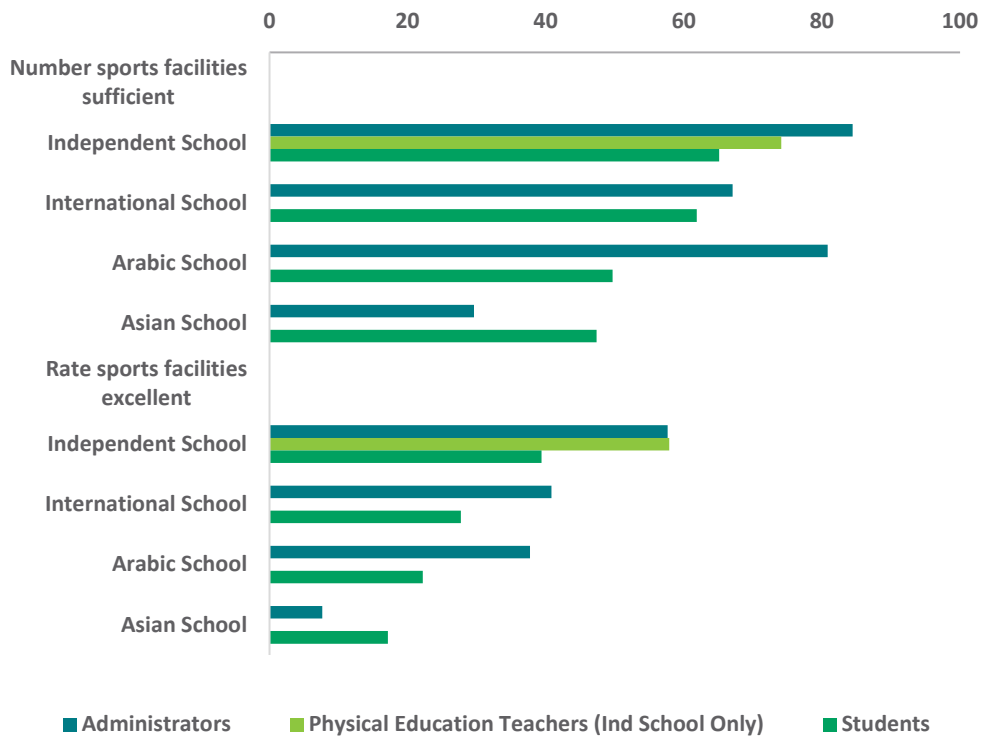
Figure 8: Percent of Schools Offering Selected Sports Activities, Supplemental Facilities Questionnaire [xliii].

Given the emphasis placed on increased physical activity by the TNHDR, it is not surprising that the majority of Independent school administrators (84 percent), physical education teachers (74 percent), and students (65 percent) feel that the number of sports facilities in their school is sufficient (see Figure 9). In only two of the Independent schools do less than half of the students report that the number of sports facilities is not sufficient, with the percent ranging from 36 percent of the students to 92 percent of the students. Independent school administrators are more likely than international school administrators to report that the number of sports facilities in their school is sufficient, while there is no difference between students in the two school types[xliv].

As is the case with the other facilities, fewer students, teachers, and administrators rate the sports facilities in their school as excellent compared to those who report the number is sufficient (see Figure 9). Approximately 60 percent of administrators and physical education teachers in the Independent schools rate their schools' sports facilities as excellent, while 40 percent of the students assign the same rating.

Students in Independent schools, however, are more likely to rate their schools' sports facilities as excellent than are students in international schools (28 percent), while administrators in the two school types are equally likely to rate the facilities as excellent. Within the Independent schools the percent of students rating their sports facilities as excellent ranges from a low of 12 percent of the students in one school to a high of 74 percent in another school.

Figure 15: Evaluation of schools sports facilities by students, Teachers, and Administrators



Within the Independent schools, there are some differences in student ratings of sports facilities based on characteristics of the students. Students who are active in a sports club or a non-school sports team are more likely to rate their schools' sports facilities as excellent (47 percent) than are those who are not active in either activity (34 percent)[xlv]. Boys (45 percent) are more likely to rate the school sports facilities as excellent than are girls (34 percent), and preparatory students (51 percent) are more likely than secondary students (30 percent) to rate the facilities as excellent.

In the SFQ one-third of Independent school operators report plans to make changes to their school's sport facilities in the next 12 months. Most of the planned changes involve routine maintenance rather than adding additional facilities, as is exemplified by such comments as "Plans to improve the outdoor playground to improve the sports hall" and "renew the floor of playgrounds and maintenance for the sports hall."

In contrast to planned changes, if resources were unlimited, the majority of Independent school operators would make more far-reaching changes to their schools' sports facilities[xlvi]. Six of the Independent school operators would build a swimming pool at the school, including the school operator who envisions major changes that would make school sports facilities available to community residents as well as to students. This operator would "Create grassy playgrounds, track for athletics, swimming pool for students and people of the neighborhood, equipped gym, a sauna and Jacuzzi attached to the gym." A second school operator also describes improvements that would be available to community members, "Gym for the employees, allowing the community to use the sports hall and the outdoor playgrounds." Consistent with concerns of the QNHS regarding preventive healthcare, one Independent school operator would begin, "Preparation of a complete program for students who suffer from obesity, create medical laboratory inside the sport hall for general measurements for students before and after exercise."

Summary For Sports Facilities:

The Independent schools offer a variety of physical activities for students. However, given the major issues of obesity and a sedentary lifestyle, and the related chronic diseases prevalent in Qatar, it is clear that more needs to be done. A key goal of the QNHS is to increase physical activity amongst all Qataris. Numerous steps have been taken to meet this goal including making physical education compulsory in all schools. The results of the SFQ, in conjunction with external reports and studies, offer additional ideas to meet this goal. We make three recommendations to increase physical activity amongst students.

First, we encourage the schools to develop programs to involve students' families in their health education. Numerous reports emphasize that while the schools play a critical role in encouraging physical activity, the support of other key communities in students' lives – most notably the family – are needed to help school-based programs succeed. A qualitative study of female Muslim students in Australia finds that parents both enable and constrain their daughters in physical activities. Interestingly, many of the parents distinguish between "sports" (such as netball and soccer) and physical activities (such as walking with their parents). The study finds that "Whilst parents can certainly act as a 'constraint' to participation in sport, it seems that when the broader term of physical activity is used, parents are more likely to act as important enablers for the young women" (pp. 113-114). This suggests a need to emphasize a variety of ways that

students can increase their activity levels, [xlvii] and to be cautious about the language used to describe these activities (e.g., sport versus physical activity).

A 2011 report prepared by the National Center for Chronic Disease Prevention and Health Promotion [xlviii] notes that "Youth perceptions and parent reports of support for physical activity are strongly associated with participation in both structured and nonstructured physical activity among children and adolescents." The report recommends schools use multiple formats to involve parents to increase the likelihood that parents will participate, and suggests such methods as "family homework assignments, healthy eating and physical activity newsletters, family nights focused on health promotion, and Internet-based programs." We encourage the Qatar schools to develop a number of different strategies to involve children's families in their physical activity efforts.

Second, we encourage the schools to make the sports facilities available to community members in the evenings and weekends. This should be a way for students to participate with their families in activities during non-school hours, which will both encourage activity for the whole family, and allow the students to see their parents as a role-model in physical activity.

Third, schools need to offer students opportunities to engage in physical activity outside of physical education classes, including but not limited to recess periods, after-school programs, intramural sports programs and physical activity clubs. These opportunities are especially important for students who come from families that do not routinely engage in physical activities during the evening and weekends.

Fourth, diversifying sports activities must constitute an integral part of the existing physical education curriculum. For in addition to the six main sports activities indicated in Figure 8, there is a great need to offer other activities that are customized to student needs, especially those with health problems. Special attention should also be given to activities that students can engage in throughout the course of their lives, such as walking, swimming, and cycling. In addition to the short term health benefits of such activities, students acquire essential lifelong skills that they can in turn pass down to their own children in the years to come.

Finally, we urge the schools to adopt employee wellness programs in which teachers and administrators are encouraged to model physical activity and healthy eating behaviors to their students. It does students no good to be told by physically inactive teachers that they – the students – should be active. Students need to see healthy behaviors modeled by adults critical in their lives, their teachers and their family members.

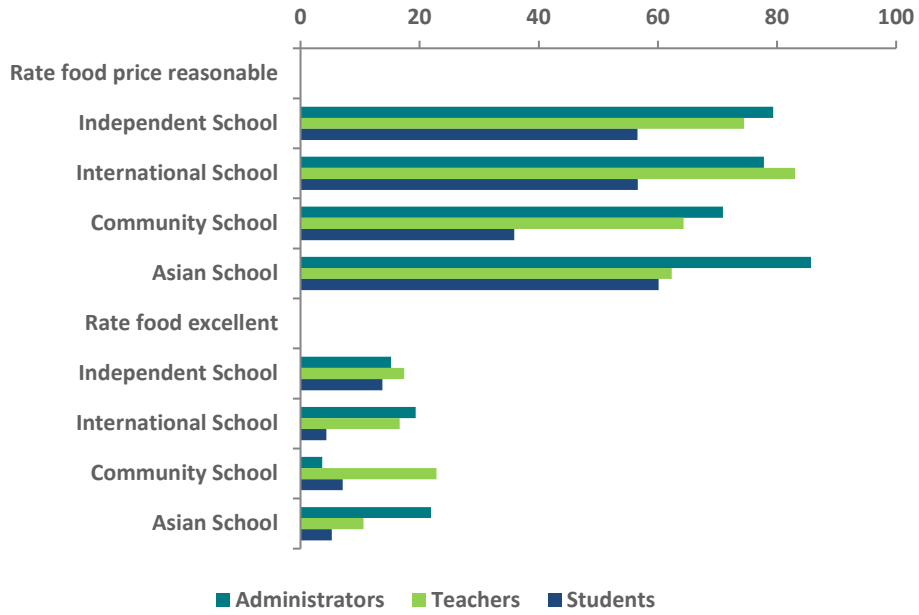
Cafeteria and Catering Services

As with school sports facilities, the school cafeteria, and the eating habits of Qatari children, are strongly related to the human development pillar and its emphasis on preventive healthcare. Encouraging healthy eating behaviors in Qatar is a major component of the QNHS. A 2013 Executive Update [xlix] to the QNHS lists a number of programs initiated to encourage healthy eating in the schools including healthy school snack guidelines and food labeling. Consistent with this focus, Qatar's Supreme Council of Health launched the "We are Healthy Kids Program" in 10 primary schools during the 2010-2011 school year. "The goal of the program is to bring about a positive change in the lives of children and replace bad habits with healthy ones in all areas of their lives while they are in school and at home which includes the addition of practicing daily physical activity and the introduction to healthy food choices for children". By the 2013-14 school year the program had been standardized across all Independent primary schools and piloted in 10 preparatory school [sli]. While this program was not yet in any of the preparatory or secondary schools at the time the QES was conducted, student evaluations of the cafeteria food remains relevant. As part of a healthy eating initiative, in 2011 – prior to the launch of the QES – the SEC banned from school cafeterias such foods as ice cream, soft drinks, chewing gums, and chips [lii].

On a broader scale, Action on Diabetes (AoD) is a partnership between the Supreme Council of Health and medical and business groups to fight obesity and diabetes. An article in the Gulf Times [liii] on AoD notes that, "having healthy choices available in school lunches can help children develop healthy habits from the start. Japan has led the way in this regard, with a school nutrition program that makes healthy eating a national priority. This program contributes to Japan's almost unique ability to resist the global trend toward obesity among affluent nations." These efforts to fight diabetes and obesity have clear implications for the food served in Qatar's schools.

With the exception of one other school, all of the school operators reported in the SFQ that their school has a cafeteria. The standard among the Independent schools is to contract with an SEC-selected outside service that prepares the food off-site and delivers it to the cafeteria. The Independent school students may choose from a selection of foods each day.

Figure 16: Evaluation of school cafeteria food by students , Teachers, and Administrators



In contrast to the other facilities, rather than asking about the sufficiency of cafeteria facilities, students, administrators, and teachers were asked to rate the quality and price of the food. When asked whether the price is reasonable, expensive, or inexpensive, the majority of Independent school teachers (75 percent), administrators (79 percent), and students (57 percent) rated the food as reasonable (see Figure 10)liv.

But while reasonable in price, less than 20 percent of these individuals rated the quality of the food as excellent. While only 13 percent of Independent school students rated the food as "excellent," this is statistically different than international school students (4 percent rated as excellent). Soon after the SEC banned junk food from school cafeterias, they conducted a survey of Independent school students and found that most prefer that unhealthy snacks be sold in their school cafeteriaslv. Given these results, it is not surprising that most Independent school students in the QES are dissatisfied with the quality of the food in their school cafeteria.

Recognizing the general dissatisfaction of Independent school students, teachers, and administrators expressed in the QES, school operators were asked in the SFQ whether there were any plans to change either the

physical infrastructure of the cafeteria or the food offerings. Only four Independent school operators reported scheduled changes. One of the schools intends to change outside vendors with the approval of the SEC, while others stressed structural changes such as repainting the cafeteria.

When asked how they would improve the cafeteria and catering services if resources were unlimited, the school operators were more expansive. Several Independent school operators commented that they would re-introduce vending machines. While some school operators would limit these vending machines to "hot drinks," others would reintroduce vending machines with both "food and drinks."

Given the push by the SEC for healthy food in the schools, it is interesting that the quality and nutritional value of the cafeteria was included in several Independent school operators' responses. One school operator would, "increase the numbers of fruits, vegetables and dairy products. Increase the number of staff that sell the food, provide multiple options of the food." Another school operator would like to see, "more healthy food, leave the fast food that causes obesity and Anemia" and a third wrote, "Prepare an integrated healthy meal sold to students on a daily basis and with a diversity in these meals on a permanent basis." In addition to healthy food, moving to a model in which the food is prepared on- site is a concern of several school operators, exemplified by, "make the cafeteria as a restaurant, and provide the students with fresh food, preparation for the food inside the cafeteria and not outside."

Summary For Cafeteria:

We have seen in the QES that all of the stakeholders in the Independent schools – students, teachers, and administrators – assign low ratings to the quality of the food in the cafeterias. Given Qatar's rate of obesity – one of the highest in the world – this is a major concernl[vi]. Moreover, the Qatar National Health Strategy 2011-2016 emphasizes that healthy eating and increased physical activity will be primary factors in reducing the risk of developing chronic diseases as well as maintaining them once developedl[vii].

Everyone at the school – administrators, teachers, and students – needs to care about and be knowledgeable about food preparation and the importance of nutrition. Numerous studies emphasize the importance of the school-setting for promoting healthy behaviorsl[viii]. Cohen et al. (2012) comment that "Schools can be viewed as a captive environment where public health interventions can reach the greatest number of students,

especially to improve dietary patterns" (p. 927). Cohen et al. also stress that while "introducing more fruits, vegetables, and whole grains on school menus is important, changes to the school food environment alone will not guarantee consumption; the foods' palatability must also be improved" (p. 928). While the SEC has introduced measures to introduce healthy food in school cafeterias, students are not satisfied. It is time to look for other solutions to help students become excited about eating a healthy diet. We make two recommendations with the joint goal of improving the quality of cafeteria food and increasing children's healthy-eating behaviors.

First, we would recommend that a pilot program be implemented in a few Independent schools in which the food is prepared onsite rather than by offsite vendors. Although limited, there are some indications that onsite preparation of food is associated with lower levels of obesity in children[lix]. We would recommend that a rigorous evaluation of this pilot program be conducted, randomly assigning a few, comparable schools (including both boys and girls schools) to either the pilot program or a comparison group with the existing food service. Students in the intervention schools and comparison schools should be measured before the program begins and at the conclusion for such things as BMI, healthy eating patterns, and satisfaction with the food. It is important that the food prepared onsite be made appealing to the students (and also to teachers and administrators). For example, a pilot program in Boston had a professional chef give lessons to school staff on preparations of exciting, but healthy food[lx].

Second, we note that nutritional lessons are being implemented in selected Independent schools. We would recommend that in addition to the students, programs be developed – such as after school healthy eating fairs and cooking classes – that involve parents as well. Al-Muraikhi (2010), in a study of eating behaviors amongst children in Qatar, including feedback from key stakeholders such as parents, teachers, and administrators, received numerous suggestions that the schools should work not only with students but with their parents to encourage healthy eating at the family level.

CONCLUSION

The four school facilities discussed in this report are directly connected with major policy goals of Qatar. While not sufficient, all four need to be exemplary if Qatar is to meet the goal of the QNV 2030 to provide students with an education equivalent to the best in the world. The science laboratories are linked with the QNV 2030 goal to increase the proportion of science and math graduates in Qatar. Additionally, both the school cafeteria and sports facilities are directly associated with the goals of the QNV 2030 related to preventive healthcare.

This report is intended to serve as a baseline assessment of key facilities available in Qatar's schools. Major steps have been taken in terms of the Independent schools; physical facilities. All of the buildings are relatively new, and regular, routine maintenance is scheduled for the facilities. However, more remains to be done if Qatar is to achieve world-class status in education. It is imperative that follow- up studies be conducted at regular intervals in the future to make certain that these Independent schools continue to improve. We have seen considerable variance across the Independent schools in such things as the percent of students reporting weekly library use and rating various school facilities as excellent. To provide a first-class education for all Qatari students, these gaps need to be closed.

Moreover, Qatar is in the midst of a major school expansion. There are currently 181 Independent schools, and plans were recently announced with to build at least 85 more [lxi]. As these schools open, it will be critical to monitor the current Independent schools in comparison to the new Independent schools to make certain they are comparable in their facilities. If all students in Qatar are to receive a world-class education, the older, original Independent schools must be maintained and upgraded so that they are comparable to the new schools.

APPENDIX A:

SURVEY METHODOLOGY

Results from the Qatar Education Study (QES) come from four surveys administered under the direction of the Survey Operations Division at the Social and Economic Survey Research Institute (SESRI). The surveys were sent to central stakeholders in K–12 education: students, parents, teachers, and administrators. An establishment questionnaire – the Supplemental Facilities Questionnaire (SFQ) – was administered by SESRI in the spring of 2014 and delivered to school operators in the original QES schools. Feedback from these stakeholders is critical to evaluating whether the reforms implemented in fulfillment of the targets outlined in the Qatar National Development Strategy 2011-2016 (NDS) are succeeding, and if not, which reforms may need reevaluation and additional support from the Supreme Education Council (SEC). This survey design is especially appropriate because it paints a clear picture of the participants' school experience. Respondents may be more forthcoming in their responses for two reasons: first, the project was conducted by an organization independent from the SEC (albeit with the blessing of the SEC); and second, the surveys included no identifiers that could trace responses to specific individuals. The neutrality and confidentiality assured in surveys administered by SESRI provide policymaking institutions with accurate and reliable data to benchmark their performance against similar institutions.

Sample design

Sampling is the process of selecting those individuals from a population to estimate characteristics of the whole population. It plays a critical part in any school survey since the ability to make valid inferences to the population, which is the target of the investigation, relies upon a rigorous sample design. In the following, we discuss issues related to the sampling design used in the QES.

Students were the target population for the survey sampling. The sampling frame, which is a list of all those individuals in a population who can be selected, was developed by SESRI based on a comprehensive list of all public and private schools in Qatar which was provided by the Supreme Council of Education. In this frame, all schools are listed with information about school names, address, school gender (boy, girl, or coed), system (independent, international, private, or other type of schools), and the number of students in grade 8, 9, 11, and 12.

Based on the information about the school size, school system, gender and grade, we divided the sampling frame into several subpopulations (i.e., stratum). This stratification divided members of the population into

subgroups that are relatively homogenous before sampling begins. We tried to ensure that every member of the population had the same probability of being selected (i.e., self-weighting) so proportionate sampling was used to make the proportion of students in each stratum similar between the frame and the sample. That means the number of sampled schools needed to be proportionate to the number of respondents across strata in the frame (assuming that the same number of students was selected from each school).

Inside each stratum, students were randomly selected following a two-stage sampling process which is probably the most commonly used sample design in educational research (UNESCO international Institute for Educational Planning 2009). In the first stage, the school was selected with probability proportionate to its size (i.e., PPS). This gives an equal chance of selection for students while allowing for a similar number of students to be chosen from each school for each strata. In the second stage, for ease of the field work, we randomly selected one class for each grade in the school and all students in the class were included in the survey.

In the student study, students in grades 11 and 12 in the secondary schools and students in grades 8 and 9 in the preparatory schools were selected. For the parent study, the parents of the students selected in the student study were sent questionnaires. Lead teachers of the classrooms selected for the study were sent questionnaires as were the administrators for the school.

We account for the complex sampling design in the data analysis to ensure the unbiasedness and efficiency of the statistical estimates. Particularly, a weighting variable was created to take into account the selection probability and the non-response. Weighting is a mathematical correction used to give some respondents in a survey more influence than others in the data analysis. This is sometimes needed so that a sample better reflects the population under study. In the QES, the number of students in the selected class can be different across schools, and a weight is needed to adjust for this difference.

Sample size, non-response, and sampling error

The sample size of the QES is 43 schools. However, 4 schools refused our survey requests. For the remaining 39 surveyed schools, all students in the selected classes fully participated in the survey. In the final data, we have 1,848 students, 1,472 parents, 572 teachers, and 318 administrators from these 39 schools.

With the above number of completions, the maximum sampling error for a percentage is +/-2 percentage points for the student survey. The calculation of this sampling error take into account the design effects (i.e., the effects from weighting, stratification, and clustering). One possible interpretation of sampling errors is: if the survey is conducted 100 times using the exact same procedure, the sampling errors would include the "true value" in 95 out of the 100 surveys. Note that the sampling errors can be calculated in this survey since the sample is based on a sampling scheme with known probabilities. This feature of random sampling is an essential element that distinguishes probability samples from other sampling methods, such as quota sampling or convenient sampling.

Questionnaire development

The questions were designed in English and then translated into Arabic by professional translators. After the translation, the Arabic version was carefully checked by researchers at SESRI who are fluent in both English and Arabic. Next, the QES questionnaires were pre-tested in four randomly selected schools. This pretest gave valuable information allowing us to refine question wording, response categories, introductions, transitions, interviewer instructions, and interview length. Based on this information, the final version of the questionnaire was created and then programmed for data entry purpose. The questionnaires were sent to stakeholders in December 2012. Parents of the students who received the student questionnaire were also sent the parent questionnaire to be completed at home. Teachers and administrators from the selected schools also received questionnaires.

Survey Administration

Each QES interviewer participated in a training program covering fundamentals of school survey, interviewing techniques, and standards protocols for administering survey instruments. All interviewers practiced the questionnaire before going to the schools. In general, interviewers were expected to:

- Locate and enlist the cooperation of schools and students.

- Motivate teachers and students to do a good job.
- Clarify any confusion/concerns.
- Observe the quality of responses.

The interviewers brought the surveys to the schools and ensured those selected for participation received a questionnaire. The students selected for the study brought home a questionnaire for their parents.

Teachers and administrators from the selected schools also received paper questionnaires to complete on their own time. The SFQ was delivered to school operators by SESRI personnel and was collected one week later.

Data Management

After QES data collection was completed, interviewers manually entered responses from students, parents, teachers, and students into Blaise, which is a computer-assisted interviewing system and survey processing tool. The responses were then merged into a single Blaise data file. This dataset was cleaned, coded and saved in STATA formats for analysis. After weighting the final responses, the data were analyzed using STATA 13 and IBM SPSS 21, both of which are general purpose statistical software packages commonly used in the social sciences. The SFQ was entered by SESRI personnel into Excel with quality checks done at the University of Michigan. Tables and graphs were generated in Microsoft Excel and Word.

ENDNOTES

[i] One school that did not complete any of the original QES questionnaires completed the Supplemental Facilities Questionnaire. We do not include that school in the count in Table 1 and none of the responses to the SFQ have been included in this report.

[ii] Most recent announcement available at Qatar Tribune: http://www.qatar-tribune.com/data/20130516/pdf/main.pdf

[iii] A review of the history of education reform in Qatar can be found in: Sonja Ben Jaafar (2012). Leadership in Qatar's educational reform in Louise Volante (Ed) *School Leadership in the Context of Standards-Based Reform: International Perspectives.* London: Springer (pp. 229-246)

[iv] The *Qatar National Vision 2030 (QNV 2030)* is available at: http://www.gsdp.gov.qa/portal/page/portal/gsdp_en/qatar_national_vision/qnv_2030_document/QNV2030_English_ v2.pdf

[v] Quoted from the General Secretariat for Development Planning 2008 and accessed at www.planning.gov.qa.

[vi] The *Qatar National Development Strategy 2011-2016* (NDS) is available at: http://www.gsdp.gov.qa/gsdp_vision/docs/NDS_EN.pdf

[vii] The *Education and Training Sector Strategy 2011-2016* (ETSS) of the SEC is available at: http://www.sec.gov.qa/en/about/documents/stratgy2012e.pdf

[viii] http://www.ashghal.gov.qa/en/Pages/default.aspx

[ix] The questions about school facilities were not included in the QES parent questionnaire.

[x] In the QES Administrator Questionnaire the respondents were asked to classify their current position as: (1) school principal; (2) academic advisor; (3) subject coordinator; or (4) other (specify).

[xi] We have translated the Arabic answers into English and paraphrased where appropriate. Original Arabic quotes can be obtained upon request.

xii In each questionnaire (student, teacher, and administrator), the respondents were first asked if their school had a particular facility (cafeteria, laboratories, sports facilities, and school library). If they said yes regarding a particular facility they were asked a follow-up question: (1) How would you rate the quality of food provided by the cafeteria?
(2) How would you rate the quality of labs at the school? (3) How would you rate the quality of sports facilities? (4) How would you rate the quality of the school library? For each of these items respondents were offered the following response options: Excellent, good, fair, poor, don't know.

xiii While the questionnaires asked about four school "facilities," in the case of the school cafeteria, the specific questions in the QES related to the quality and price of the food.

xiv Knowledge economy careers are defined as careers in science, technology, engineering, mathematics, and medical professions.

xv See for example the following sources on the importance of science laboratories for students to learn science: (1) Michael O. Martin, Ina V.S. Mullis, Pierre Foy, and Gabrielle M. Stanco (2012) TIMSS 2011 International Results in Science. Boston: TIMSS & PIRLS International Study Center; (2) The National Science Teachers Association (NSTA) position on science laboratory investigations (http://www.nsta.org/about/positions/laboratory.aspx) ; (3) the National Association of Biology Teachers (NABT) position on laboratories (http://www.nabt.org/websites/institution/index.php?p=95); (4) Sunday A. Adeyemo. (2012). The influence of teachers' supply and the provision of laboratory facilities on students' achievement in physics. European Journal of Educational Studies 4(3): 397-409.

xvi The QES asked teachers to indicate which courses they teach. In other sections of the report we look at the evaluations of all teachers in the school with regard to such facilities as the cafeteria and the school library. However, we believe that science teachers can provide a more accurate assessment of the quality of the science laboratories and the frequency with which their students use the laboratories.

xvii Teachers and students were asked how frequently they use the school's science laboratories in a slightly different fashion. Teachers were asked, "In a typical week, how often do your students use the labs?" and were offered the following response options: (1) Once a week; (2) Twice a week; (3) Three times a week; (4) More than three times a week; (5) Never; and (8) Don't know. Students were asked, "How often do you use the labs?" and were offered the following response options: (1) Everyday; (2) Once a week; (3) Twice a week; (4) Once a month; (5) Less than once a month; and (6) Never. For purposes of this report we have dichotomized both sets of responses into 0 (less than twice a week) and 1 (twice a week or more).

xviii Gail L. Zellman, Gery W. Ryan, Rita Karam, Louay Constant, Hanine Salem, Gabriella Gonzalez, Nate Orr, Charles A. Goldman, Hessa Al-Thani, and Kholode Al-Obaidli. (2009). Implementation of the K/12 education reform in Qatar's schools. Santa Monica, CA: RAND Corporation.

xix The SFQ asked, ""Does your school have any programs or activities that are designed to encourage your students to be interested in science and consider careers in the Knowledge Economy? By Knowledge Economy we mean jobs in science, mathematics, engineering, and medicine." If respondents answered "yes," they were asked: "Could you briefly describe these programs in the space below?"

xx More information about Al-Bairaq World can be found at: http://www.qu.edu.qa/offices/research/CAM/dmsprogram/aboutus.php

xxi More information about the Robot Olympiad can be found at: http://www.sec.gov.qa/En/Media/News/Pages/NewsDetails.aspx?NewsID=3393

xxii OECD (2013). PISA 2012 Results: What Students Know and Can DO – Student Performance in Mathematics, Reading, and Science (Volume I), PISA, OECD Publishing. http://dx.doi.org/10.1787/9789264201118-en.

xxiii While many focus on the absolute ranking of their nation in a given subject area on the PISA tests (such as being first in mathematics or tenth in science) analyses of PISA scores raises questions about the rankings. Kreiner and Christensen (2013) analyzed the 2006 data and report that their findings "do not support the claims that the country rankings reported by PISA are robust" (Svend Kreiner and Karl Bang Christensen (2013). Analyses of model fit and robustness: A new look at the PISA scaling model underlying ranking of countries according to reading literacy.
Psychometrika DOI: 10.1007/S 11336-013-9347-Z.) An article in the New Zealand Listener interviewed Kreiner and he suggested that countries focus on change over time for their own nation's scores, rather than on the absolute rankings which are subject to considerable variation, and are frequently not significantly different (http://www.listener.co.nz/current-affairs/education/education-rankings-flawed/)

xxiv Ziad Said and Heather L. Friesen. (2013). Topic article on the impact of educational reform on science and mathematics education in Qatar. A paper presented at the 1st Annual International Interdisciplinary Conference, April 24-26, 2013, in Azores, Portugal. Found at http://eujournal.org/index.php/esj/article/viewFile/1379/1388

xxv Numerous sources are available for information about desired school science facilities. See for example: (1) Public Schools of North Carolina (2010). School Science Facilities Planner . Raleigh, NC. Found at http://www.schoolclearinghouse.org/pubs/Science.pdf (2) National Clearinghouse for Educational Facilities (2009). Science Facilities. Washington, DC; (3) James Biehle (2008) Inside/Out Architecture. Found at http://insideoutarch.com/the-importance-of-planning-school-science-facilities/

xxvi Stephanie L. Knight, Dawn Parker, Whitney Zimmerman, and Atman Ikhlief (2014). Relationship between perceived and observed student-centred learning environments in Qatari elementary mathematics and science classrooms. Learning Environ Research 17:29-47.

xxvii Areepattamannil (2012) used 2006 PISA data (prior to ENF and the introduction of curriculum reform and the Independent schools) and found a positive relationship between "inquiry-based" science education practices and interest and achievement in science, while finding a negative relationship between hands-on, student-lead investigations and achievement and interest. While interesting, the study is limited in that no classroom-level data is available and the methods of science teaching rely on student-reports, rather than teacher-reports or classroom observations. (See Shaljan Areepattamannil (2012) Effects of inquiry-based science instruction on science achievement and interest in science: evidence from Qatar, The Journal of Educational Research, 105:2, 134-146, DOI: 10.1080/00220671.2010.533717.)

xxviii Hofstein, Avi, and Vincent N. Lunetta (2004). The laboratory in science education: Foundations for the twenty- first century." Science Education 88: 28-54.

xxix See (1) Elisabeth Abarbanel; Sarah Davis; Dorcas Hand; Matthew Wittmer. (2013) The New School Library: The Human Connection to Digital Resources and Academic Success." Independent School Magazine (summer, 2013). http://www.nais.org/Magazines-Newsletters/ISMagazine/Pages/The-New-School-Library.aspx; (2) Kang,
J.H. & Everhart, N. (2014). Digital textbooks: school librarians' stages of concerns in initial implementation; Information Research, 19(2) paper 625. [Available at http://InformationR.net/ir/19-2/paper625.html]; (3) Australian School Library Association. (2013). Future Learning and School Libraries. ASLA, Canberra, ACT. (available at www.asla.org.au/site/DefaultSite/.../2013-ASLA-futures-paper.pdf) (4) Helen Boelens (2010) The Evolving Role of the School Library and Information Centre in Education in Digital Europe. Doctoral Dissertation, Middlesex University (https://eprints.mdx.ac.uk/7329/1/BoelensThesis-Final_2010.pdf).

xxx http://www.sec.gov.qa/En/Elearning/Pages/default.aspx

xxxi Education in the Schools of the State of Qatar: Annual Report for the Academic Year 2012/2013 (2014). Supreme Education Council, Doha, Qatar. http://www.sec.gov.qa/En/Media/News/Pages/NewsDetails.aspx?NewsID=3462

xxxii The School operators were asked, "Could you describe in general terms what your school library is like, including such things as the number of books, tables, and computer stations.

xxxiii In this figure we only include Independent and international schools, as the number of Asian and Arabic schools completing the SFQ is too small.

xxxiv In the SFQ the school operators were asked, "Are there any plans within the next twelve months to make changes to either the physical infrastructure of the library or to the library collection?" Those responding affirmatively were asked, "Please describe these plans in the space below."

xxxv The SFQ asked school operators, "Has the e-learning project been implemented in your school?" School operators replying "no" were asked, "Do you know when it is scheduled to be implemented in your school?"

xxxvi Nasser (2014) reports on a survey of 912 education stakeholders (primarily teachers, school coordinators, parents, administrators, and members of the SEC) in Qatar designed to gather perceptions of key education issues relevant to education reform. One of the nine key areas – or challenges – identified in the process relates to Information Communication Technology (ICT). The author notes that, "In Qatar, ICT is beginning to generally change traditional communication and knowledge sharing in Qatari classrooms. There are many schools that are advanced in their use of ICT, whereas others lag behind. This has created a have and have-not knowledge situation and needs to be examined in order to reduce the current discrepancies." (pp. 6-7). (See: Ramzi Nasser (2014). A methodological and scientific approach to developing a research agenda in education. Journal of Applied Sciences. DOI: 10.3923/jas.2014 Found at: http://docsdrive.com/pdfs/ansinet/jas/0000/64295-64295.pdf

xxxvii Myrna Tabet et al. (2013) Digital library initiative: A project for educators in Qatar. ACM Inroads 4(34): 70-75. See also: http://elisq.qu.edu.qa/

xxxviii Qatar National Health Strategy 2011-2016. http://www.nhsq.info/app/media/325

xxxix Expanding the Capacities of Qatari Youth, Mainstreaming Young People in Development: Qatar's Third National Human Development Report (2012). Doha, Qatar: General Secretariat for Development Planning. http://www.youthpolicy.org/library/documents/qatars-third-national-human-development-report-expanding-the- capacities-of-qatari-youth-mainstreaming-young-people-in-development/

xl More information about the Sahtak Awalan Your Health First campaign can be found at: http://www.qatarisbooming.com/article/sahtak-awalan-%E2%80%9Cyour-health-first%E2%80%9D-campaign- kicks-souq-waqif

xli For additional information about the Qatar Active Schools program see http://www.aspetar.com/Programs/PgmQatarActiveSchools.aspx

xlii In the SFQ the school administrators were asked, “Next, we would like to ask you a few questions about the sports facilities in your school. First, does your school have sports facilities?” All schools responding affirmatively were asked, “Could you describe in general terms what sports facilities are available at your school in the space below?”

xliii In this figure we only include Independent and international schools, as the number of Asian and Arabic schools completing the SFQ is too small.

xliv Too few physical education teachers from the International, Arabic, and Asian schools completed the teacher questionnaire to allow for any comparisons with Independent school physical education teachers.

xlv Students were asked, “Have you ever participated in any of the following outside-school activities during the past school year?” The list of activities included “Sports clubs” and “Non-school team sports.” We have included anyone who checked “yes” to either of these two activities as being active in sports, feeling that they may also have more exposure to or interest in the school sports facilities.

xlvi In the SFQ the school operators were asked, “If you had unlimited resources, what would you like to improve about the sport facilities?”

xlvii Kelly Knez , Doune Macdonald & Rebecca Abbott (2012) Challenging stereotypes: Muslim girls talk about physical activity, physical education and sport, Asia-Pacific Journal of Health, Sport and Physical Education, 3:2, 109-122, DOI: 10.1080/18377122.2012.700691

xlviii Report prepared by the Division of Adolescent and School Health, National Center for Chronic Disease Prevention and Health Promotion found at: http://www.cdc.gov/mmwr/preview/mmwrhtml/rr6005a1.htm

xlix General Secretariat, Supreme Council of Health (2013). National Health Strategy 2011-2016, Caring for the Future: Executive Summary Update 2013. Qatar. Located at:

l http://www.sch.gov.qa/sch/En/catcontent.jsp?scatId=786&scatType=1

li http://www.sch.gov.qa/sch/En/catcontent.jsp?scatId=786&scatType=1

lii http://thepeninsulaqatar.com/news/qatar/141856/authorities-fix-prices-for-school-canteens

liii http://www.gulf-times.com/opinion/189/details/383448/qatar-taking-positive-action-in-fight-against-obesity- epidemic

liv THE SEC has fixed the prices of various food items that are allowed to be sold in Independent school cafeterias. http://thepeninsulaqatar.com/news/qatar/141856/authorities-fix-prices-for-school-canteens

lv http://thepeninsulaqatar.com/news/qatar/157843/students-prefer-junk-food-to-fruits-yoghurt-in-school-canteens

lvi See for example: (1) Rory Jones (February 10, 2014). Diabetes epidemic hits Persian Gulf Region, Wall Street Journal. http://online.wsj.com/news/articles/SB10001424052702304773104579268223173652920; (2) Faleh Mohamed Hussain Ali, Zlatko Nikoloski, Husein Reka, Orsida Gjebrea, and Elias Mossialos. (2014). The diabetes- obesity-hypertension nexus in Qatar: evidence from the World Health Survey. Population Health metrics 12(18): doi: 10.1186/1478-7954-12-18. http://ww.pophealthmetrics.com/content/12/1/18; (3) Supreme Council of Health (2013). Qatar Stepwise Report 2012: Chronic Disease Risk Factor Surveillance; and (4) Hanan F Abdul Rahim, Abla Sibai, Yousef Khader, Nahla Hwalla, Ibtihal Fadhil, Huda Alsiyabi, Awad Mataria, Shanthi Mendis, Ali H Mokdad, and Abdullatif Husseini (2014). Non-communicable diseases in the Arab world. The Lancet. http://dx.doi.org/10.1016/S0140-6736(13)62383-1.

Lvii http://www.nhsq.info/strategy-goals-and-projects/preventative-healthcare/nutrition-and-physical-activity/nutrition-n-physical-activity

lviii See for example: (1) Amal Essa Ahmad Thani AL-Muraikhi (2010). Preventing Obesity in School Children in the State of Qatar. A thesis submitted to The University of Birmingham for the degree of Doctor of Philosophy; and

(2) Juliana F.W. Cohen, ScD, ScM; Liesbeth A. Smit, ScM; Ellen Parker, MBA, MSW; S. Bryn Austin, ScD; A. Lindsay Frazier, MD, ScM; Christina D. Economos, PhD; Eric B. Rimm, ScD (2012). Long-Term Impact of a Chef on School Lunch Consumption: Findings from a 2-Year Pilot Study in Boston Middle Schools. Journal of the Academy of Nutrition and Dietetics 112(6): 927-933 doi: 10.1016/j.jand.2012.01.015

lix See for example: (1) Hung-Hao Chang (2014). Food preparation for the school lunch program and body weight of elementary school children in Taiwan. International Food and Agribusiness Management Review 17(1): 21-36.

lx Juliana F.W. Cohen, ScD, ScM; Liesbeth A. Smit, ScM; Ellen Parker, MBA, MSW; S. Bryn Austin, ScD; A. Lindsay Frazier, MD, ScM; Christina D. Economos, PhD; Eric B. Rimm, ScD (2012). Long-Term Impact of a Chef on School Lunch Consumption: Findings from a 2-Year Pilot Study in Boston Middle Schools. Journal of the Academy of Nutrition and Dietetics 112(6): 927-933 doi: 10.1016/j.jand.2012.01.015

lxi http://www.sec.gov.qa/En/Media/News/Pages/NewsDetails.aspx?NewsID=3524

Qatar Education Study 2012

Executive Summary

Curriculum Report

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INTRODUCTION

The leadership of Qatar is greatly invested in its K–12 education because it views education as the key to the nation's economic and social progress. To this end, the Father Emir, His Highness Sheikh Hamad Bin Khalifa Al-Thani, announced a sweeping education reform in 2002 – Education for a New Era (EFNE) – to enhance educational quality and renewed this commitment in 2013 with a 360 billion riyal health and education fund. [1] His Highness Sheik Tamim bin Hamad Al Thani has continued this priority because he recognizes the value of a highly trained and educated population. Although Qatar has had a fairly developed education system before 2002, it was not enough to fully meet the demands of the economic, social, and cultural changes underway in the country, not to mention the challenges of a global economy. To transform Qatar into a diversified and advanced knowledge economy, the leadership prioritized a complete overhaul of the public school system with a particular emphasis on curriculum standards and content.

Following quickly after the 2002 announcement, the Supreme Education Council (SEC) opened the first cohort of independent schools in 2004 [2]. Each fall thereafter another cohort of independent schools was opened until in September 2010 Qatar achieved the goal of converting all Ministry schools to Independent schools. These Independent schools are given a fair amount of autonomy in teaching methods and are encouraged to be innovative to meet the needs of their students; but this innovation must be set within the framework of the new national curriculum standards[3].

Education reform is only as good as the curriculum standards that are established. An education system can have world-class facilities and an abundance of extracurricular activities, but if the curriculum standards are low the students will not achieve at levels required to take a place in the knowledge economy. National curriculum standards are at the center of educational reform in Qatar. Internationally benchmarked standards have been set for each grade level from Kindergarten through grade 12 for Arabic, English, mathematics, and science. For instance, by grade 12 students in the independent schools should be able to manipulate algebraic expressions such as dividing a polynomial by a quadratic expression.[4] All these standards are consistent with the goals established for Qatar's future.[5]

In 2008, following years of comprehensive planning and analysis, the state of Qatar articulated long-term national goals and values in the Qatar

National Vision 2030 (QNV 2030) [6], which sets the framework for growth and development, mainly through advanced, high quality educational and training services. In fulfillment of this mission, the QNV 2030 "aims to build a modern world-class educational system that provides students with a first-rate education, comparable to that offered anywhere in the world."[7] The Qatar National Development Strategy 2011-2016 (NDS) [8] outlines the targets for achieving the goals in the QNV 2030, and the Education and Training Sector Strategy 2011-2016 (ETSS) [9] of the Supreme Education Council (SEC) identifies the measurable outcomes and projects to prepare citizens for the future. The curriculum standards set for Qatar are designed to help students meet the national goals outlined in the QNV and the NDS.

The ultimate aim of any educational reform is to enhance student outcomes in such areas as academic achievement and educational aspirations. The NDS notes that one of the key challenges facing Qatar's education system is "the underachievement of Qatari students in math, science and English language at all levels" (p. 124). The recent release of the 2012 PISA scores, eight years after the introduction of the first Independent schools in Qatar, provides a mixed assessment of Qatar education10. While the average mathematics, reading, and science scores of 15-year old Qatari students remain below average when compared to students from around the world, Qatar was one of the only nations in which students improved in all three subject areas from 2006[11]. It is important to note that the PISA tests, while attracting world-wide attention, are not directly linked to the actual curriculum standards or curriculum in place in any given nation, including the standards established in Qatar[12].

With the full establishment of Independent schools in Qatar and the publication of curriculum standards in essential academic areas, key local stakeholders, including administrators and teachers, are critical to the successful implementation of education reform at the local school level[13]. In 2011 the NDS raised concerns that teachers were overwhelmed by the reform and noted that "The concurrent implementation of curriculum standards that need to be detailed by teachers, a student-centered teaching approach and the use of English as the instructional language may be burdening teachers with so many new responsibilities that classroom learning has suffered" (NDS, p. 132). If teachers and administrators feel overwhelmed, do not understand or support the curriculum standards, or are dissatisfied with the curriculum content and teaching materials, successful implementation of the reform is unlikely.

The Qatar Education Survey (QES) provides a resource for policymakers with a variety of topics pertaining to how students, parents, teachers, and administrators view the current education system. For this report we use information from the teacher and administrator 14 questionnaires regarding four policy-relevant areas related to the implementation of the national curriculum standards at the local level.

This report examines the views of teachers and administrators toward K–12 education in Qatar. It is based on results from the Qatar Education Study (QES), which is a series of surveys conducted by the Social and Economic Survey Research Institute (SESRI) in December 2012. Together, the surveys included more than 4,200 participants from 39 preparatory and secondary schools as detailed in the following table. Collecting and analyzing these data is a considerable undertaking, requiring SESRI to publish the results in stages. This report presents findings in four areas related to curriculum:

Curriculum standards: Teachers and administrators give qualified support for the curriculum standards and administrators have less confidence than teachers that teachers adequately understand the standards.

Curriculum content: Teachers are more satisfied with curriculum content than administrators, but the satisfaction varies substantially across the Independent schools.

Textbooks and other teaching materials: Teachers are not enthusiastic about the textbooks available for their courses and rely heavily on materials they prepare themselves.

Student assessment and evaluation: While teachers and administrators do not feel that the national tests are a burden for teachers, they do question the utility of these assessments.

Table 1: Number of schools and participants in the Qatar education study

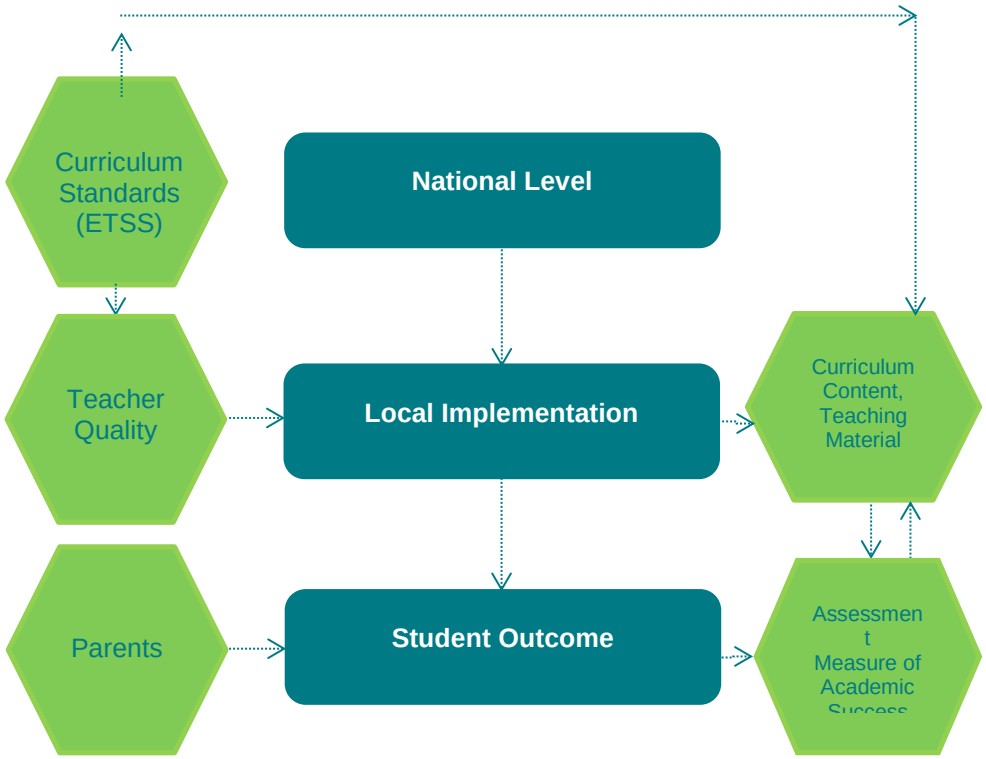
Total Number of surveyed schools	**39** schools	
	Independent Schools 24 schools	Other Schools 15 schools
Total number of surveyed students	**1,848** students	
	Independent Schools 1158 students (742 Qatari students)	Other Schools 690 students
Total number of surveyed parents	**1,472** parents	
	Independent Schools 877 parents (514 Qatari parents)	Other Schools 595 parents
Total number of surveyed teachers	**572** teachers	
	Independent Schools 384 teachers (77 Qatari teachers)	Other Schools 188 teachers
Total number of surveyed school administrators	**318** administrators	
	Independent Schools 205 administrators (109 Qatari admin)	Other Schools 113 administrators

These surveys help capture attitudes on a number of issues pertaining to schools in Qatar from current participants in preparatory and secondary education. The schools in the sample represent a cross-section of the major school types (e.g., Independent, private) and coeducational and single-gender programs. The design of the QES allows for comparison within groups (e.g. all students in grade 8 or 9) and makes it possible to examine an issue from the combined perspective of students, parents, and educators. Examining the attitudes of all members of the education system

will assist in the development of future plans for education in Qatar. Because the national standards apply only to the Independent Schools in Qatar, in this report we only use the data collected from teachers and administrators in the Independent Schools.

Curriculum standards, curriculum content, textbooks and other teaching materials, and student assessment are intricately linked (see Figure 1). The curriculum and materials used by teachers are intended to operationalize the curriculum standards; as such they logically follow after curriculum standards in our discussion. Formalized student assessment reveals whether the students have attained the knowledge prescribed in the standards. We focus on the results of the teacher and administrator questionnaires to understand their beliefs about the state of education in Qatar.

Figure 17: The path to student academic success



Because the success of education reform rests on local implementation, we look not only at overall teacher and administrator views, but at differences between schools. For example, do Independent school

teachers and administrators react uniformly regarding the implementation of curriculum standards, or are there some schools in which problems appear?

Finally, for a massive national educational reform to succeed, local teachers and administrators must be enthusiastic – and able – supporters of the initiative. They must believe strongly that such things as the curriculum standards and national tests are valid, and they must be knowledgeable about the best methods to implement the standards at the local level 15. For this reason, we focus on strong levels of support – rather than lukewarm levels of support – by teachers and administrators in the following sections.

Curriculum Standards

A major component of education reform in Qatar was the establishment of curriculum standards for critical academic subjects at each grade level[16]. The curriculum standards "spell out what knowledge and skills students should acquire at each K–12 education level and ensure that students receive an education that reflects the advanced standards used in other countries."[17] The curriculum standards are also intended "to help each Independent School to plan its curriculum, to guide writers of teaching and learning materials, and to inform the design of tests and examinations." [18]

Previous reports reveal some problems in the implementation of curriculum standards in Qatar at the local level. The NDS notes that the curriculum standards, "constituted a challenge for teachers and students, especially when accompanied by other changes, such as adopting English as the language of instruction and introducing a student-centered approach to teaching."[19] The QES allows us to examine teacher and administrator attitudes toward and actions regarding the curriculum standards, nearly two years after the NDS was issued.

While teachers and administrators express little dissatisfaction with the curriculum standards in the QES, their satisfaction is qualified. Only 37 percent of the teachers and 22 percent of the administrators are "very satisfied," with the curriculum standards, while another 57 percent of teachers and 67 percent of administrators are "somewhat satisfied" with the curriculum standards (see Figure 2). There is substantial variation in satisfaction with the curriculum standards across the Independent schools. The percent of administrators in a school who are very satisfied with the curriculum standards ranges from none to 71 percent. As with the administrators, teacher satisfaction varies by school from a low of eight percent of teachers being very satisfied in one school to a high of 69 percent of the teachers in another school. Overall there is only a weak relationship between the percentage of teachers and administrators satisfied or very satisfied with the curriculum standards within schools (correlation = .39).

There is considerable variation in teacher satisfaction with curriculum standards based on the subject and level that they teach (see Figure 3). Among preparatory teachers, the percent of teachers very satisfied with curriculum standards ranges from a low of 25 percent of Islamic studies teachers to a high of 50 percent of science teachers. In comparison, only 12 percent of the secondary mathematics teachers are very satisfied with

the standards while 53 percent of social studies teachers are very satisfied.

If the curriculum standards are to be successfully implemented in the classroom, teachers must thoroughly understand the standards. Despite some reservations about curriculum standards, nearly half of the teachers (49 percent) feel that their fellow teachers know the curriculum standards for their subject to a "great extent" and another 44 percent feel teachers know the standards to "some extent." Administrators express slightly less confidence in teachers' knowledge of the standards. Just over one-third of the administrators feel teachers know the standards to a "great extent" and an additional 54 percent feel they know the standards to "some extent."

Administrators' beliefs that teachers know the curriculum standards to a great extent varies by school from none of the administrators believing the teachers know the curriculum standards to a great extent to 86 percent of the administrators believing the teachers know the standards to a great extent. An examination of teacher and administrators' beliefs about the level of teachers' knowledge about curriculum standards within the same schools reveals little congruence (correlation = .07). There is a general tendency for a greater percentage of teachers in a school than administrators to believe that teachers know the curriculum standards to a "great extent." However, the difference between the percent of teachers and administrators believing teachers know the standards to "a great extent" ranges from -30 (56 percent of teachers and 86 percent of administrators) to +58 (58 percent of teachers and 0 percent of administrators). Clearly there is a difference between teachers and administrators beliefs about teachers' understanding of the curriculum standards, signaling potential problems for the consistent implementation of the curriculum standards within some Independent schools.

Since administrators have some doubts about teachers' knowledge of curriculum standards, do they regularly review the standards with teachers in their school? And by extension, do administrators regularly discuss the standards with their students' parents, emphasizing the importance of the standards to their child's educational success? It is difficult to know what a reasonable number of discussions about standards might be. With parents, perhaps once a semester is adequate. With teachers, three or more times may be more reasonable.

Subject coordinators report the most frequent discussions with teachers, with 91 percent discussing curriculum standards three or more times a semester (see Figure 4). Two-thirds of academic advisors and just over half of principals/license owners discuss standards with teachers three or

more times a semester. In contrast, 85 percent of academic advisors discuss curriculum standards with parents at least once a semester, compared to just over 50 percent of subject coordinators and principals/license owners.

Figure 18: Administrator and teacher attitudes toward curriculum standards

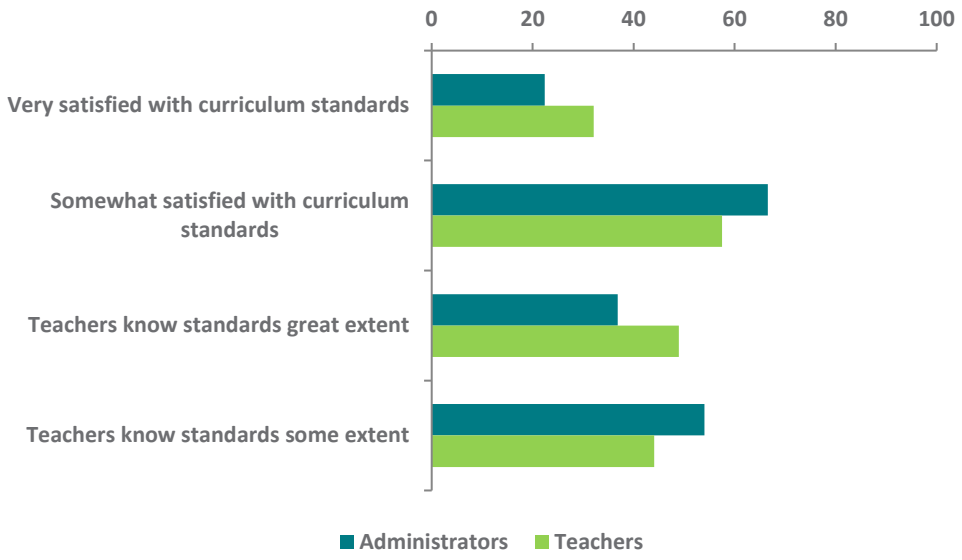


Figure 19: percent of teachers very satisfied with curriculum standards by subject and level taught

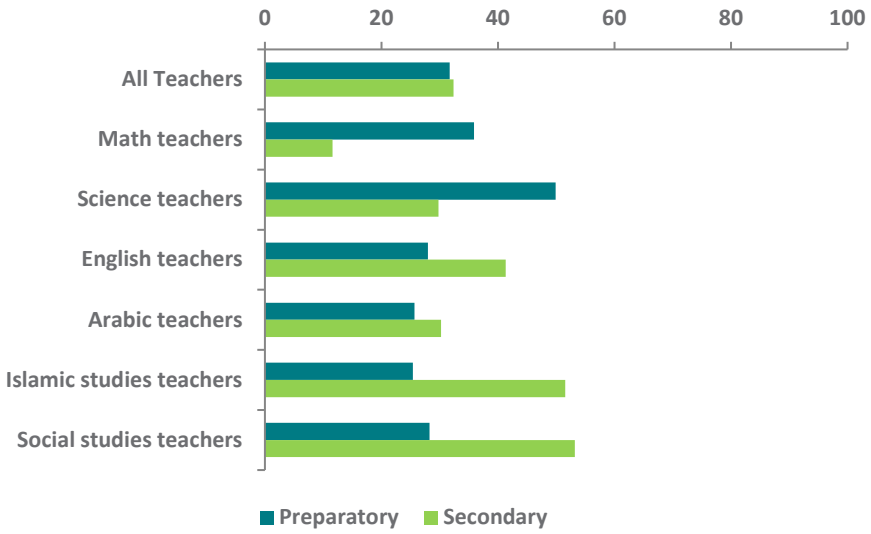
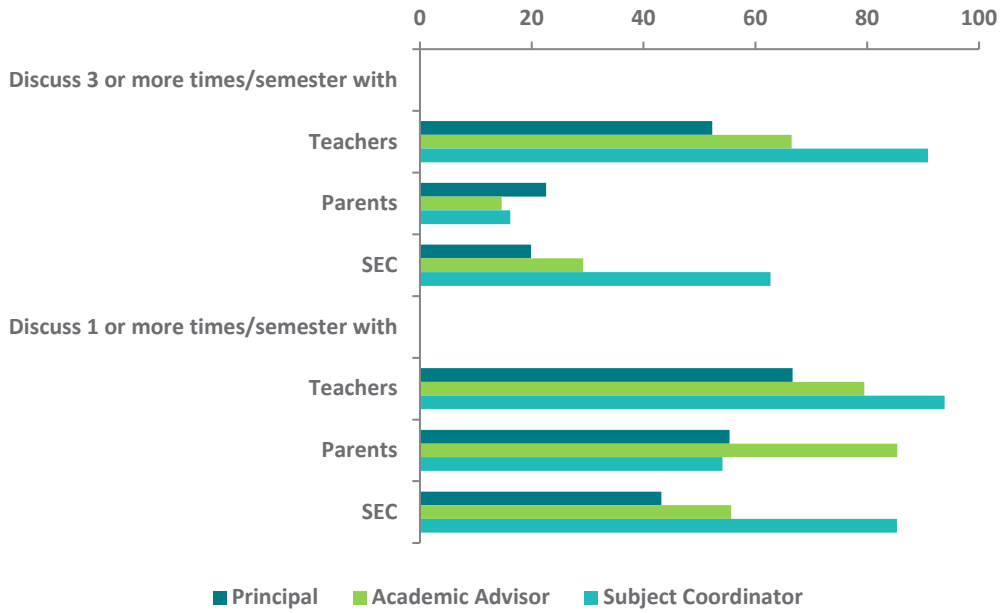


Figure 20: Independent school administrator discussions about curriculum standards each semester



Summary for curriculum standards:

We have seen that teachers and administrators have only qualified satisfaction with the curriculum standards, and that this satisfaction varies substantially across the Independent schools. Additionally, we have found

that administrators have less confidence in teachers' knowledge of the standards than do the teachers themselves. In the following section we will examine teachers and administrators' attitudes toward their implementation of the standards – through curriculum content – in their schools.

Curriculum Content

The curriculum standards established by the SEC provide the goals for teachers to follow in developing lesson plans and materials appropriate to the grade and subject they teach. In essence, the curriculum content is the local implementation of the nationwide curriculum standards. The QES includes a series of questions for both administrators and teachers assessing their attitudes toward curriculum content.

Overall, twice as many teachers (34 percent) as administrators (17 percent) are very satisfied with the curriculum content (see Figure 5). There is considerable variation in teacher satisfaction with curriculum content between schools, ranging from schools in which only 20 percent of the teachers are very satisfied with curriculum content to those in which half the teachers are very satisfied. The percent of administrators very satisfied with curriculum content ranges from a low of none of the administrators in a school (10 schools) to 57 percent of the administrators. There is virtually no relationship between teacher and administrator satisfaction with curriculum content within schools (correlation = .01). For example, in the two schools with the highest percent of teachers who are very satisfied with curriculum content (50 percent) only 14 percent of the administrators are very satisfied. Conversely, in the two schools in which 57 percent of the administrators are very satisfied, 20 percent of the teachers in one school and 35 percent in another school are very satisfied with curriculum content. Clearly there is not a homogenous environment within the schools with regard to curriculum content.

We found only minimal differences in satisfaction with curriculum content based on administrative position. However, there appear to be some differences in teacher satisfaction based on the level and subject that they teach (see Figure 6). The percent of secondary teachers very satisfied with curriculum content ranges from just 10 percent of mathematics teachers to 49 percent of Islamic studies teachers; among preparatory teachers satisfaction ranges from a low of 31 percent of Islamic teachers to a high of 45 percent of mathematics and English teachers. While only approximately 10 percent of both administrators and teachers believe that the curriculum is an obstacle to a good education to a great extent, nearly 40 percent of administrators and 26 percent of teachers believe that the curriculum is an obstacle to some extent.

Figure 21: Teachers and administrators and curriculum content

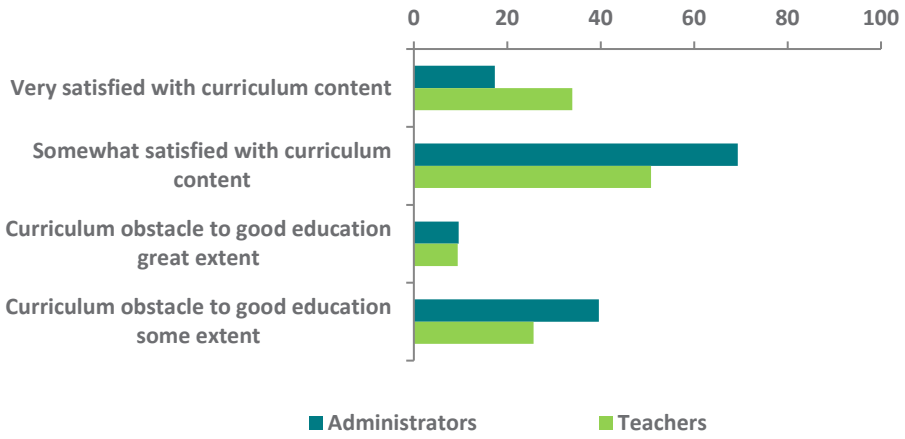
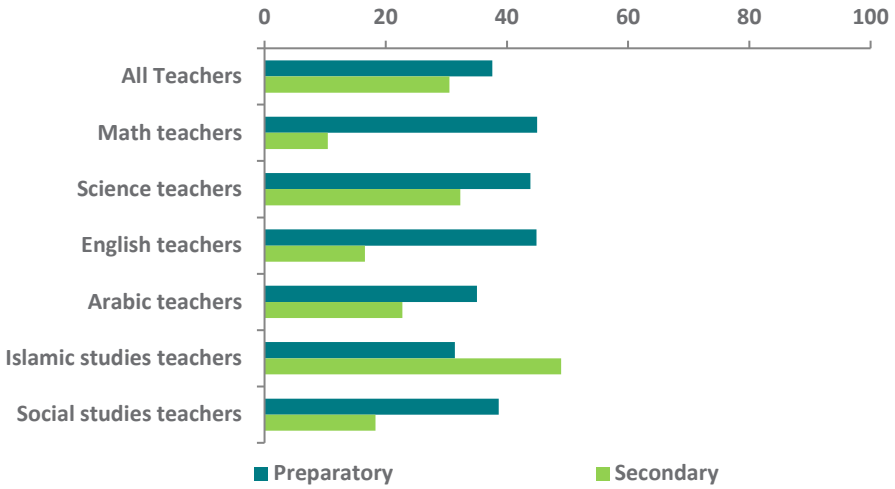


Figure 22: percent teachers very satisfied with curriculum content by level and subject



Given their qualified satisfaction with curriculum content, do administrators review the content with teachers on a regular basis? Administrators' reports of their review of curriculum content with teachers are very similar to their reviews of curriculum standards. Once again, subject coordinators report the highest levels of reviews with teachers, with 90 percent reviewing content three or more times a semester with teachers, in comparison to 60 percent of academic advisors and 52 percent of principals (see Figure 7).

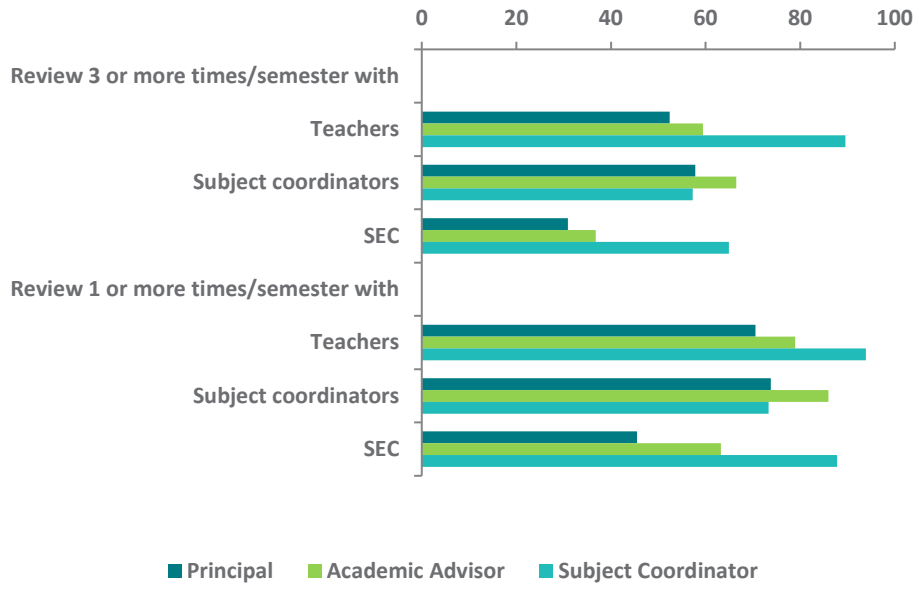
It is important to remember that the curriculum taught by teachers is the tool for ensuring that the nationally set standards are met by students. Independent schools – and by extension the teachers – are empowered to develop lesson plans and materials to teach the curriculum. Does a lack of enthusiasm for the curriculum content mean that teachers are dissatisfied with the standards, or merely with the way the standards are

implemented in their school? While we cannot know for sure, there is a strong relationship between the teachers' level of satisfaction with the curriculum standards and their satisfaction with the curriculum content20 . For example, 60 percent of the teachers who are very satisfied with the curriculum standards are also very satisfied with the curriculum content, while another 37 percent are somewhat satisfied. In contrast, only 15 percent of the teachers who are very dissatisfied with the curriculum standards are very satisfied with the curriculum content.

Summary for curriculum content:

We have found that teachers are more satisfied with curriculum content than administrators, with considerable variation for both across the schools. In the following section we will see how this relates to the teachers' attitudes toward the textbooks and teaching materials that they use to convey the curriculum content to their students

Figure 23: Administrator review of curriculum content each semester by position



Textbooks and other Teaching Materials

The use of textbooks has evolved during the period of educational reform in Qatar. Initially there was a high level of local autonomy with the Independent schools empowered to develop their own teaching materials to meet the needs of their students in order to achieve the national curriculum standards. Instead of nationally-mandated textbooks the Independent schools could select their own textbooks or teachers could eliminate textbooks completely and prepare their own materials. Howard and Major (2005) note that teacher-produced materials can enhance student learning by allowing teachers to take into account such factors as their own learning environment and the individual needs of their students[21].

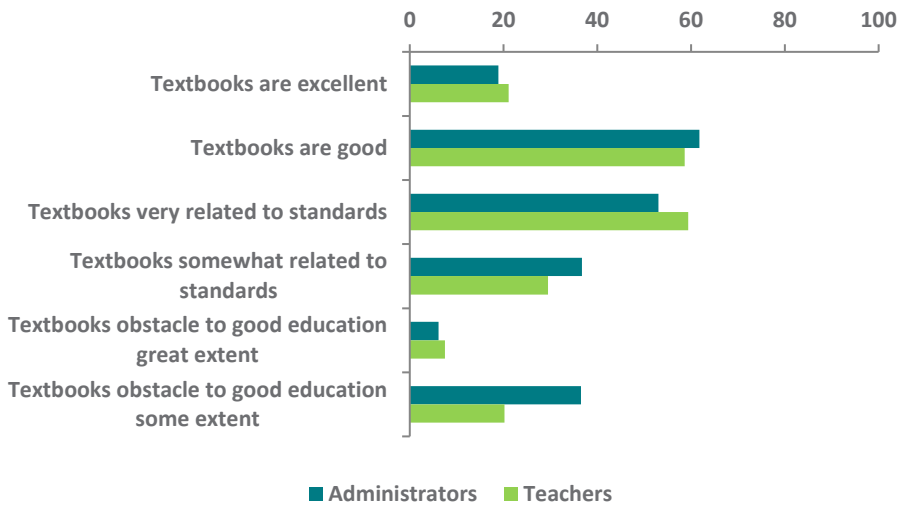
There is an inherent tension between teacher autonomy and the need for accountability for student performance in most national education systems [22] . Under EFNE even when teachers had a high degree of autonomy for preparing their own materials, they were still held accountable for their students learning the curriculum standards. This early level of individuality and autonomy has changed over the subsequent years. Partially as a result of complaints from parents about the inferior quality of teacher-prepared materials, the SEC gradually increased the role of textbooks [23] . It should be noted that criticisms about the quality of teacher-prepared materials are not unique to Qatar. Howard and Major find that the major criticism levied against teacher-produced materials is the quality of the materials, noting that "They may contain errors, be poorly constructed, lack clarity in layout and print and lack durability." (p. 103)[24]. Currently, a list of textbooks is approved by the SEC based on subject and grade level[25]. However, these texts do not cover all of the material in the curriculum standards and teachers are encouraged to develop and provide supplemental materials to ensure that their lessons cover all aspects of the curriculum so that their students will meet the grade-level curriculum standards.

Teacher and administrator ratings of the textbooks selected by the SEC are less than enthusiastic, with approximately 20 percent of both groups rating the textbooks as excellent (see Figure 8). There is some variance in teacher ratings of textbooks based on subject and grade level taught. Approximately three times as many preparatory mathematics and science teachers rate their textbooks as excellent as do English and social studies teachers at the same level (see Figure 9). At the secondary level, over twice as many Islamic studies teachers rate their textbooks as excellent in comparison to mathematics and English teachers at the same level.

Setting aside the issue of the subject taught, we might ask if there is a general sense of dissatisfaction with textbooks within a school. In no school did all of the teachers rate the textbooks as fair or poor
, but the percent assigning these low ratings ranges from 7 percent (two schools) to 46 percent (one school).

Particularly troubling is the finding that only 53 percent of administrators and 59 percent of teachers believe that the textbooks are “very related” to the curriculum standards established for the disciplines, which is problematic if students are tested on and are expected to meet the standards. However, despite these reservations, less than 10 percent of both teachers and administrators believe that the textbooks are an obstacle to good education in Qatar to a “great extent.”

Figure 24: Administrator and teacher attitudes toward textbooks



It is clear that nearly all of the Independent school teachers routinely prepare teaching materials to supplement textbooks (see Figure 10) and rarely or never use teaching materials prepared by outside sources (such as publishing companies). Given past concerns with the quality of teacher-prepared materials, the latter may be problematic, and may explain why the SEC has taken steps to have more supplemental teaching materials prepared by outside sources26.

Some early evaluations of the Independent schools stressed the increased collaboration apparent in the Independent schools in contrast

to the old Ministry schools. As such, collaborating with other teachers to prepare teaching materials would exemplify this trend, and 94 percent of the teachers at least sometimes collaborate with other teachers in their school to prepare teaching materials. However, if teachers are ill-prepared to develop their own materials, this collaboration is not necessarily a positive sign.

Figure 25: Percent of teachers rating textbooks as excellent by subject and level taught

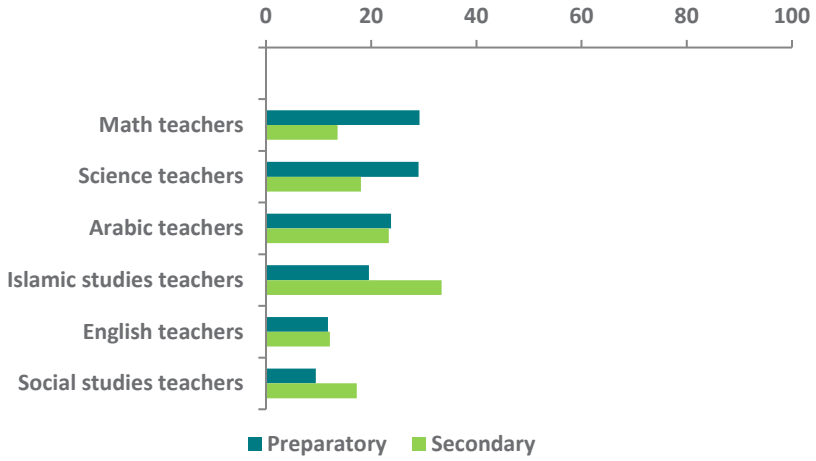
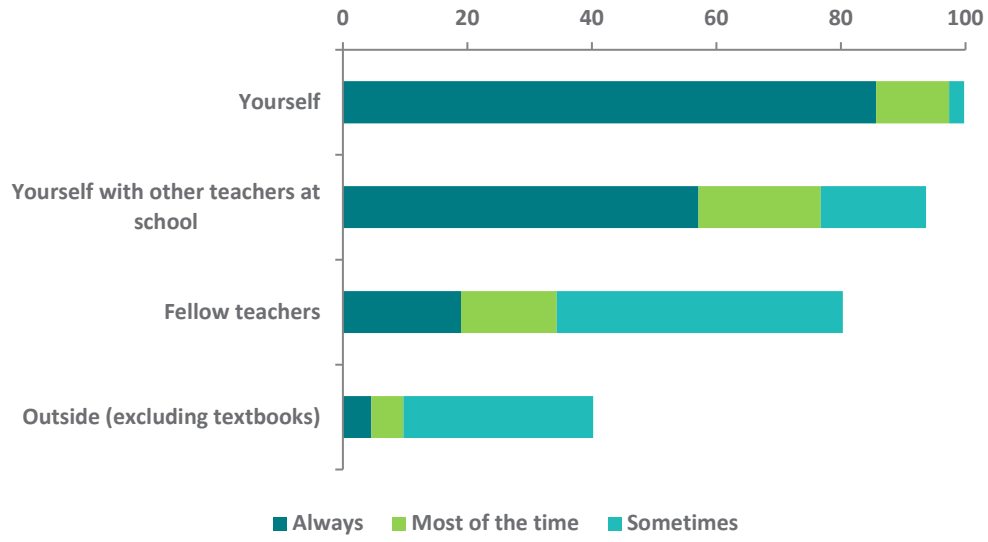


Figure 26: Independent school teachers use of materials other than textbooks



Moving forward, the E-Learning project of the SEC will make curricular materials directly accessible to Independent school students through the distribution of tablet computers. A late 2012 announcement about the launch of the E-Learning Portal communication and electronic library indicated that the SEC intends to "begin to implement interactive e-book project, which will replace the textbook during the five-year plan for the implementation of e-learning projects."[27] The E-Learning project will need to be carefully monitored. Books, whether in print or digital format, still require the students to have adequate reading levels to be able to digest the material presented.

Summary for textbooks and other teaching materials:

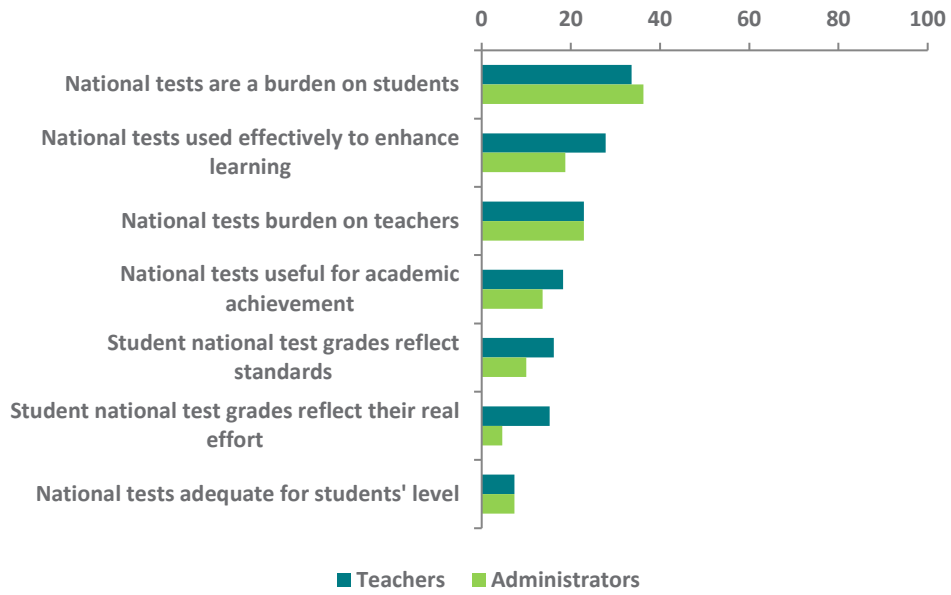
Textbooks and other teaching materials convey the curriculum content to students. We have seen here that teachers are not enthusiastic in their ratings of textbooks, and rely heavily on materials that they prepare themselves. The whole area of textbooks and associated teaching materials has undergone considerable change over the course of Qatar education reform and continues to the present. It will be critical to monitor teacher and student use of, and satisfaction with, the e-learning project and its associated materials.

Tests and Evaluation

Regular assessment was included as an integral part of Qatar's ENF. The NDS notes that "to share accountability, a transparent assessment system – the annual Qatar Comprehensive Evaluation Assessment for independent school students – holds all school leaders, teachers and parents accountable for the success of students." The Student Assessment Office is responsible for designing and implementing the Qatar Comprehensive Educational Assessment (QCEA), a program that measures student learning. This program administers standardized tests to students in the independent schools in Qatar. Testing is done annually, with the first tests occurring in April and May 2004 to establish a baseline from which to compare all future test results" (SEC website)[i].

While only a third of teachers and administrators feel strongly that the national tests are a burden on students and approximately one-quarter feel they burden teachers, both administrators and teachers have doubts about the usefulness and validity of the national tests (see Figure 11)[ii]. Only 15 percent of teachers and 5 percent of administrators feel strongly that the national tests reflect the students' real efforts, and less than 10 percent of both teachers and administrators feel strongly that the national tests are adequate for the students' level [iii].

Figure 27: Teachers and administrators attitudes toward national tests

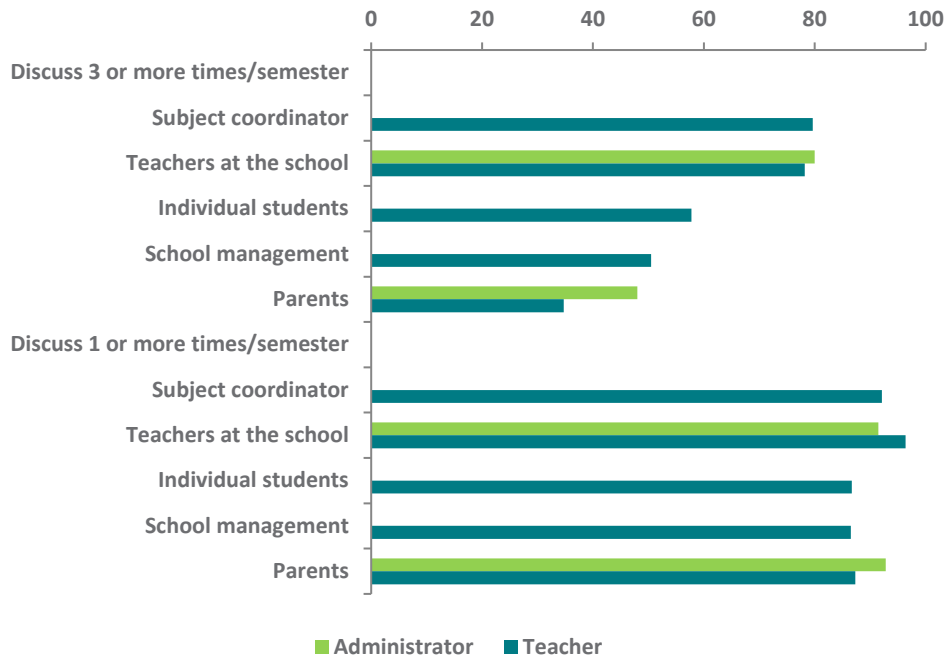


Given the critical role of student assessment within Qatar's educational reform, we would expect to see a high level of discussion between key stakeholders about the assessments. Approximately 80 percent of teachers discuss assessment with subject coordinators three or more times a semester and another 12 percent have these discussions at least once a semester; nearly as many teachers report having discussions about assessment with other teachers at their school (see Figure 12). However, only 58 percent of teachers report discussing assessment with students at least three times a semester and another 29 percent have discussions with students at least once a semester. Over 80 percent of both administrators and teachers discuss assessment with parents at least once a semester.

Summary for tests and evaluation:

While most teachers and administrators do not feel that the national assessments are a burden on teachers or students, they question the usefulness of these assessments. In our final section we pull together the results from this and the preceding sections and make suggestions for future evaluations of the Qatar educational system.

Figure 28: Teachers and administrators discussions of student assessment



CONCLUSION

The QES provides important insights into the attitudes of teachers and administrators toward crucial curriculum-related matters as of late 2012. The QES occurred ten years after Education for a New Era was introduced, and two years after the Independent schools were fully realized in Qatar, serving as an important time period for an early evaluation of education reform. The 2011-12 Annual Report of the Evaluation Institute of the SEC, which makes use of the Qatar Comprehensive School Surveys and various administrative data, provides an additional portrait of the Qatar schools at nearly the same time[31]. Both of these sources provide important information about the current state of schools in Qatar. However, while the Evaluation Institute's Annual Report includes over 100 figures and tables depicting various aspects of the educational system, it does not describe teacher evaluations of curriculum standards or curriculum content.

It is important to remember that the QES – as with any one-time study of a sampling of schools – provides us with information at a single point in time. We have found little outright opposition or dissatisfaction among administrators and teachers regarding the curriculum standards, curriculum content, textbooks, and national tests. However, their satisfaction with and support of these curricular matters is qualified and tepid. Will these same teachers and administrators at these same schools be more satisfied and feel more confident about the curriculum content and standards in the future, especially as the Qatari education system continues to be revised through such features as the introduction of the E-Learning project? And what impact will continued levels of indifference have on student achievement?

Likewise, international data sets such as PISA are a series of cross-sectional – or one-time -- studies collected over time. While we can see that the average scores of Qatar 15-year old have increased significantly over the recent PISA administrations, we do not know how the same students have fared over time. Have the 15-year old who participated in PISA in 2006 continued to improve as they advanced in school, and will the 15-year old who participated in 2012 continue to improve as the Qatar education system evolves? We cannot answer these questions from cross-sectional studies. In a similar manner, while the Evaluation Institute's Annual Report provides some system- wide comparisons across school years of such factors as standard test scores in various subjects, it provides no linkages of the effect of various school-level factors (such as teachers who are dissatisfied with curriculum standards and

content) on student outcome measures in subsequent years. Are the high performing PISA students going on to university? Are they more likely to specialize in a knowledge economy field? What are the fates of the low performing PISA students? Without the benefit of a study tracking the same cohort of students via a longitudinal study, the 2002 education reforms cannot be definitively evaluated using either the SEC public data or the QES study. We believe it is also critical that a neutral authority, such as SESRI, collect this data. If administrators send questionnaires to the SEC, they may be less likely to report problems in the curriculum standards and teaching materials.

An impartial organization collecting the data signals to teachers and administrators that they can disclose concerns in the implementation of EFNE standards without fear of recrimination or reprisal from central government authorities. This will ensure more honest and accurate responses and help the SEC identify problems much earlier in the process.

Education reform in Qatar continues to evolve, and to capture the full process and its impact on individual students and teachers, a longitudinal study is needed in which the same students, teachers, and administrators at the same schools are revisited over the years. Such a design will allow us to see the long-term impact of key school- level factors on critical student outcome measures such as educational plans, career objectives, and academic achievement.

Longitudinal studies ask the same individuals – or panel -- to complete surveys and/or academic achievement tests repeatedly, over some period of time. Each survey or test that the panel is asked to complete generally includes some of the same questions allowing for the measurement of change in attitudes, behaviors, and knowledge over time at the individual level.

We have talked about some of the major changes introduced by EFNE that are related to curriculum in this report. It is critical that the effect of these changes, as well as their differential implementation at the local school level, be monitored. For example, do students whose 9th, 10th, and 11th grade mathematics teachers are more knowledgeable about the curriculum standards perform better on their 12th grade mathematics evaluation tests? Are these students more likely to want to major in mathematics in college than students whose 9th, 10th, and 11th grade teachers are less knowledgeable about the mathematics standards? And do the students whose teachers are more knowledgeable also come from

homes with more abundant learning resources than the students with less knowledgeable teachers? What is the long term effect of the introduction of tablets and curricular materials through the E-Learning Project? Are the students who use their tablet the most in 7th grade the students with the highest reading scores in 6th grade? Or do students with low reading ability in the 6th grade make more use of their tablets in the 7th grade, and experience a significant increase in their reading ability by the 8th grade. We can only answer such critical policy-relevant questions through the use of a longitudinal study. Cross-sectional studies hint at the relationship between factors but cannot establish the time order of events. More importantly, cross- sectional studies do not allow us to follow the same students throughout their school years and take into account differences in their home and differences in the implemented curriculum that they experience. In contrast to a generation ago, primary and secondary schooling in Qatar is now universal and literacy rates for children are near 100 percent. Students in Independent schools continue to improve their scores on international assessments, namely PISA, and the government continues to make substantial investments to modernize the entire education system, as demonstrated by the E-Learning program. Yet there is evidence that the education performance of Qatari students is not progressing at a rate commensurate to their international peers, despite a decade of reforms.

As readily acknowledged by government authorities, “Qatar will not be able to improve significantly its relative standing in relation to other countries…without significant improvements in education performance. Nor will the huge potential for Qatari youth to play a more prominent role in Qatar’s development be realized without their attaining relevant education qualifications…” [32]

The national curriculum standards, curriculum content, textbook and teaching materials, and student assessments are indispensable pieces to elevating performance, but as highlighted in this report, without the support of teachers and administrators, it will be difficult for Qatar to meet the goals outlined in the QNS, no matter the amount of resources invested in the education system. Juxtaposed with the need for teacher support, a longitudinal study is recommended to measure change as a result of the reforms. Armed with this information, policymakers and educators can more accurately evaluate the success of the EFNE as well as provide course corrections when it becomes clear a standard is underperforming.

APPENDIX A:

SURVEY METHODOLOGY

Results from the Qatar Education Study (QES) come from four surveys administered under the direction of the Survey Operations Division at the Social and Economic Survey Research Institute (SESRI). The surveys were sent to central stakeholders in grade 8,9,11 and 12: students, parents, teachers, and administrators. Feedback from these stakeholders is critical to evaluating whether the reforms implemented in fulfillment of the targets outlined in the Qatar National Development Strategy 2011-2016 (NDS) are succeeding, and if not, which reforms may need reevaluation and additional support from the Supreme Education Council (SEC). This survey design is especially appropriate because it paints a clear picture of the participants' school experience.

Sample design

Sampling is the process of selecting those individuals from a population to estimate characteristics of the whole population. It plays a critical part in any school survey since the ability to make valid inferences to the population, which is the target of the investigation, relies upon a rigorous sample design. In the following, we discuss issues related to the sampling design used in the QES.

Students were the target population for the survey sampling. The sampling frame, which is a list of all those individuals in a population who can be selected, was developed by SESRI based on a comprehensive list of all public and private schools in Qatar which was provided by the Supreme Council of Education. In this frame, all schools are listed with information about school names, address, school gender (boy, girl, or coed), system (independent, international, private, or other type of schools), and the number of students in grade 8, 9, 11, and 12.

Based on the information about the school size, school system, gender and grade, we divided the sampling frame into several subpopulations (i.e., stratum). This stratification divided members of the population into subgroups that are relatively homogenous before sampling begins. We tried to ensure that every member of the population had the same probability of being selected (i.e., self-weighting) so proportionate sampling was used to make the proportion of students in each stratum similar between the frame and the sample. That means the number of sampled schools needed to be proportionate to the number of

respondents across strata in the frame (assuming that the same number of students was selected from each school).

Inside each stratum, students were randomly selected following a two-stage sampling process which is probably the most commonly used sample design in educational research (UNESCO International Institute for Educational Planning 2009). In the first stage, the school was selected with probability proportionate to its size (i.e., PPS). This gives an equal chance of selection for students while allowing for a similar number of students to be chosen from each school for each strata. In the second stage, for ease of the field work, we randomly selected one class for each grade in the school and all students in the class were included in the survey.

In the student study, students in grades 11 and 12 in the secondary schools and students in grades 8 and 9 in the preparatory schools were selected. For the parent study, the parents of the students selected in the student study were sent questionnaires. Lead teachers of the classrooms selected for the study were sent questionnaires as were the administrators for the school.

We account for the complex sampling design in the data analysis to ensure the unbiasedness and efficiency of the statistical estimates. Particularly, a weighting variable was created to take into account the selection probability and the non-response. Weighting is a mathematical correction used to give some respondents in a survey more influence than others in the data analysis. This is sometimes needed so that a sample better reflects the population under study. In the QES, the number of students in the selected class can be different across schools, and a weight is needed to adjust for this difference.

Sample size, non-response, and sampling error

The sample size of this survey is 43 schools. However, 4 schools refused our survey requests. For the remaining 39 surveyed schools, all students in the selected classes fully participated in the survey. In the final data, we have 1,848 students, 1,472 parents, 572 teachers, and 318 administrators from these 39 schools. With the above number of completions, the maximum sampling error for a percentage is +/-2 percentage points for the student survey.

The calculation of this sampling error take into account the design effects (i.e., the effects from weighting, stratification, and clustering). One possible interpretation of sampling errors is: if the survey is conducted 100 times using the exact same procedure, the sampling errors would include

the "true value" in 95 out of the 100 surveys. Note that the sampling errors can be calculated in this survey since the sample is based on a sampling scheme with known probabilities. This feature of random sampling is an essential element that distinguishes probability samples from other sampling methods, such as quota sampling or convenient sampling

Questionnaire development

The questions were designed in English and then translated into Arabic by professional translators. After the translation, the Arabic version was carefully checked by researchers at SESRI who are fluent in both English and Arabic. Next, the questionnaire was tested in a pre-test of four randomly selected schools. This pretest gave valuable information allowing us to refine question wording, response categories, introductions, transitions, interviewer instructions, and interview length. Based on this information, the final version of the questionnaire was created and then programmed for data entry purpose. The questionnaires were sent to stakeholders in December 2012. Parents of the students who received the student questionnaire were also sent the parent questionnaire to be completed at home. Data were collected from teachers and administrators through interviews conducted in their respective schools.

Survey Administration

Each interviewer participated in a training program covering fundamentals of school survey, interviewing techniques, and standards protocols for administering survey instruments. All interviewers practiced the questionnaire before going to the schools. In general, interviewers were expected to:

- Locate and enlist the cooperation of schools and students.
- Motivate teachers and students to do a good job.
- Clarify any confusion/concerns.
- Observe the quality of responses.

Data were collected from students and parents using paper questionnaires (Paper-and- Pencil Interviewing – PAPI). Teachers and administrators from the selected schools were interviewed by SESRI fieldworkers using Computer-Assisted Personal Interviewing (CAPI).

Data Management

After data collection was completed, interviewers manually entered responses from students and parents into Blaise, which is a computer-

assisted interviewing system and survey processing tool. The responses were then merged into a single Blaise data file. This dataset was then cleaned, coded and saved in STATA formats for analysis. After weighting the final responses, the data were analyzed using STATA 12 and IBM SPSS 20, both of which are general purpose statistical software packages commonly used in the social sciences. Tables and graphs were generated in Microsoft Excel and Word.

ENDNOTES

1 Most recent announcement available at Qatar Tribune: http://www.qatar-tribune.com/data/20130516/pdf/main.pdf

2 A review of the history of education reform in Qatar can be found in: Sonja Ben Jaafar (2012). Leadership in Qatar's educational reform in Louise Volante (Ed) School Leadership in the Context of Standards-Based Reform: International Perspectives. London: Springer (pp. 229-246)

3 Expanding the Capacities of Qatari Youth: Mainstreaming Young People in Development. Qatar's Third National Development Report (2012). General Secretariat for Development Planning, Doha, Qatar. http://planipolis.iiep.unesco.org/upload/Qatar/Qatar_HDR_2012_English.pdf

4 For the mathematics standards, refer to: http://www.sec.gov.qa/Grade%20And%20Subject/Math-Grade%2012%20(advanced-mathematics%20for%20science).pdf

5 The curriculum standards can be found by grade-level at http://www.sec.gov.qa/En/Education/Pages/GradeAndSubject.aspx.

6 The Qatar National Vision 2030 (QNV 2030) is available at: http://www.gsdp.gov.qa/portal/page/portal/gsdp_en/qatar_national_vision/qnv_2030_document/QNV2030_E nglish_v2.pdf

7 Quoted from the General Secretariat for Development Planning 2008 and accessed at www.planning.gov.qa.

8 The Qatar National Development Strategy 2011-2016 (NDS) is available at: http://www.gsdp.gov.qa/gsdp_vision/docs/NDS_EN.pdf

9 The Education and Training Sector Strategy 2011-2016 (ETSS) of the SEC is available at: http://www.sec.gov.qa/en/about/documents/stratgy2012e.pdf

10 OECD (2013). PISA 2012 Results: What Students Know and Can DO – Student Performance in Mathematics, Reading, and Science (Volume I), PISA, OECD Publishing. http://dx.doi.org/10.1787/9789264201118-en.

11 While many focus on the absolute ranking of their nation in a given subject area on the PISA tests (such as being first in mathematics or tenth in science) analyses of PISA scores raises questions about the rankings. Kreiner and Christensen (2013) analyzed the 2006 data and report that their findings "do not support the claims that the country rankings reported by PISA are robust" (Svend Kreiner and Karl Bang Christensen (2013). Analyses of model fit and robustness: A new look at the PISA scaling model underlying ranking of countries according to reading literacy. Psychometrika DOI: 10.1007/S 11336-013-9347-Z.) An article in the New Zealand Listener interviewed Kreiner and he suggested that countries focus on change over time for their own nation's scores, rather than on the absolute rankings which are subject to considerable variation, and are frequently not significantly different (http://www.listener.co.nz/current-affairs/education/education- rankings-flawed/)

12 In an early article about the 2000 PISA scores, Prais cautioned that the PISA tests are "directed to so-called 'everyday life' problems – which provides less guidance for policy on schooling." (p. 139). S.J. Prais (2003). Cautions on OECD's recent educational survey (PISA). Oxford Review of Education, 29(2): 139-163

13 Three recent recent articles emphasize the critical nature of principals and teachers at this stage of education reform in Qatar: (1) Michael H. Romanowski, Maha Ellili Cherif, Badria Al Ammar, and Asma Al Attiyah (2013) Qatar's educational reform: The experiences and perceptions of principals, teachers and parents, in International Journal Education, Vol. 5, No. 3, pp. 108-135; (2) Sonja Ben Jaafar (2012) Leadership in Qatar's educational reform in Louise Volante (Ed.) School Leadership in the Context of Standards-Based Reform: International Perspectives. London: Springer (pp. 229-246); (3) John McKeown (2011). 'Give us a place to stand and a place to grow': Educational reform in Ontario and Qatar (pp. 165-176). In Proceedings of the X Worldwide Forum on Education and Culture, Rome, Italy. Roberto Bergami, Sandra Liliana Pucci, and Annamarie Schuller (Eds.).

14 In the QES Administrator Questionnaire the respondents were asked to classify their current position as:
(1) school principal; (2) academic advisor; (3) subject coordinator; or (4) other (specify). For this report, we use the following categories: (1) school principal/VP/license owner; (2) academic advisor; and (3) subject

coordinator. We excluded other administrators from this report as their responsibilities are not as directly linked to curriculum standards and curriculum content.

15 In a review that finds criticism with the new Qatari licensure system for teachers and administrators, Ellili- Cherif, Romanowski, and Nasser cite research emphasizing that educational reform requires that educators not only change their educational practices, but their belief systems as well. (Maha Ellili-Cherif, Michael H. Romanowski, and Ramzi Nasser (2012). All that glitters is not gold: Challenges of teacher and school leader licensure licensing system in Qatar. International Journal of Educational Development 32: 471-481.

16 According to the SEC website, curriculum standards have been developed and are being administered by the Curriculum Standards Office in science, mathematics, English, Arabic, and Islamic studies, as well as in early years education (3-6 year olds) (http://www.sec.gov.qa/En/SECInstitutes/EducationInstitute/Offices/Pages/CurriculumStandardsOffice.aspx)

17 See the NDS, p. 123.

18 See the 2004 Education Institute report, p. 9. The curriculum standards for English includes a description of the purposes of the standards and can be found at www.ibe.unesco.org/curricula/qatar/qa_al_eng_2004_eng.pdf

19 NDS, p. 132.

20 The gamma for the relationship is .66.

21 In a 2005 paper Howard and Major describe four primary advantages of teacher-produced materials: (1) Contextualization – allows teachers to take into account their own unique learning environment rather than using a generic material developed for all classrooms; (2) Individual needs – teachers can produce or select materials that meet the particular level and abilities of their students, rather than materials developed for all levels; (3) Personalization – provides a personal touch to the materials and also allows the teachers to be more spontaneous; and (4) Timelines – teachers can respond to current local, national, and international events and incorporate them into their lessons. Howard, J. and Major, J. (2005) Guidelines for designing effective English language teaching materials. Seoul, South Korea: PAAL9, Oct 2004. In Proceedings of the 9th Conference of Pan-Pacific Association of Applied Linguistics 101-109. http://www.paaljapan.org/resources/proceedings/PAAL9/pdf/Howard.pdf. (Conference Contributions - Papers in published proceedings).

22 See for example: Emery J. Hyslop-Margison and Alan M. Sears (2010). Enhancing teacher performance: The role of professional autonomy. Interchange 41: 1-15.

23 Zellman et al. (2009) in an early evaluation of education reform in Qatar found that many concerns were expressed by parents about the lack of a single textbook and about the use of duplicated worksheets and other materials developed by teachers with no experience in developing such materials. As a result, “to offset some of the concerns about the lack of prescribed textbooks, the Education Institute implemented a policy for academic year 2007-2008 wherein schools had to select one primary textbook that would address approximately 70 percent of the material included in the relevant standards. Supporting material could augment the selected text.” (p. 68) (Gail L. Zellman, Gery W. Ryan, Rita Karam, Louay Constant, Hanine Salem, Gabriella Gonzalez, Nate Orr, Charles A. Goldman, Hessa Al-Thank, and Kholode Al-Obaidli (2009). Implementation of the K–12 Education Reform in Qatar’s Schools. Santa Monica, CA: RAND Corporation.

25 Ellili-Cherif and Romanowski (2013) comment on the change in textbooks within the general revisions to education reform in Qatar and note that, “With the launch of the reform, schools were free to select instructional materials, and teachers had much maneuvering space in choosing materials that they believe help their learners to reach the curriculum standards. However, now, many schools are required to select one textbook from a list provided by the Supreme Education Council.” (p. 15). Maha Ellili-Cherif and Michael Romanowski (2013). Education for a New Era: Stakeholders’ perception of Qatari education reform.
International Journal of Education Policy & Leadership 8(6): 1-17.

26 An article in the Doha News in April 2012 revealed that the SEC had arranged for international publishers to prepare teaching materials in Arabic, Islamic history Qatari history, math, science, social studies and English. http://dohanews.co/sec-new-learning-materials-will-comply-with-qatars/ Additionally, examples of lesson plans and activities linked to curriculum standards can be found at such SEC-sanctioned sites as as the one for science standards and activities (http://csoscience.wordpress.com/2012/11/)

27 http://www.sec.gov.qa/En/Elearning/Pages/default.aspx

28 http://www.sec.gov.qa/En/SECInstitutes/EvaluationInstitute/SAO/Pages/default.aspx

29 On two of the national test questions the response categories were different in the Administrator Questionnaire and the Teacher Questionnaire. Both teachers and administrators were asked whether they strongly agreed, somewhat agreed, somewhat disagreed, or strongly disagreed with five statements: (1) National tests are adequate for students' level; (2) National tests are useful for students with regard to academic achievement; (3) National tests are a burden on the teachers; (4) National tests are a burden on the students; and (5) National tests are used effectively to enhance the learning process. For the remaining two statements – the students' grades in the national tests reflect their real effort and students grades in the national tests reflect the fulfillment of the national standards – administrators were offered the same set of response options as for the other five statements, while teachers were asked to use a scale where 1=to a great extent, 2=to some extent, 3=to a little extent, and 4=to no extent at all.

30 We created a summary measure of attitudes toward national tests after factor analysis revealed that five items ((1) National tests are adequate for students' level; (2) National tests are useful for students with regard to academic achievement; (3) National tests are a burden on the teachers; (4) National tests are a burden on the students; and (5) National tests are used effectively to enhance the learning process) all load on a single factor with factor loadings of at least .65. However, no mean differences in the scale appeared based either on the subject or the grade level taught.

31 Schools and Schooling in Qatar 2011-2012: Annual Report on Schools and Schooling in Qatar. Evaluation Institute, Doha, Qatar. http://www.sec.gov.qa/Statistical%20Report/2011-2012.pdf

32 Qatar's Third National Human Development Report, p. 63.
http://planipolis.iiep.unesco.org/upload/Qatar/Qatar_HDR_2012_English.pdf

[i] http://www.sec.gov.qa/En/SECInstitutes/EvaluationInstitute/SAO/Pages/default.aspx

[ii] On two of the national test questions the response categories were different in the Administrator Questionnaire and the Teacher Questionnaire. Both teachers and administrators were asked whether they strongly agreed, somewhat agreed, somewhat disagreed, or strongly disagreed with five statements: (1) National tests are adequate for students' level; (2) National tests are useful for students with regard to academic achievement; (3) National tests are a burden on the teachers; (4) National tests are a burden on the students; and (5) National tests are used effectively to enhance the learning process. For the remaining two statements – the students' grades in the national tests reflect their real effort and students grades in the national tests reflect the fulfillment of the national standards – administrators were offered the same set of response options as for the other five statements, while teachers were asked to use a scale where 1=to a great extent, 2=to some extent, 3=to a little extent, and 4=to no extent at all.

[iii] We created a summary measure of attitudes toward national tests after factor analysis revealed that five items ((1) National tests are adequate for students' level; (2) National tests are useful for students with regard to academic achievement; (3) National tests are a burden on the teachers; (4) National tests are a burden on the students; and (5) National tests are used effectively to enhance the learning process) all load on a single factor with factor loadings of at least .65. However, no mean differences in the scale appeared based either on the subject or the grade level taught.