MBRSLP
Research Report
2015-2016

[December 2016]

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Authors

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Executive summary

This research report is the third annual study on the Mohammed Bin Rashid Smart Learning Programme (MBRSLP), assessing its effectiveness in 2015-2016 and providing a comparison with previous years of implementation. The research documents the development and expansion of the MBRSLP over the past year, reviewing the progress made, challenges faced, and opportunities ahead. It employs a mixed-methods approach in order to understand the developing perceptions, attitudes and practices of principals and teachers that are engaging with the programme. Through this, the research provides a contribution to the growing evidence base for the MBRSLP, capturing the learning that is taking place and providing data to inform on-going programme development.

The MBRSLP has initiated a substantial and ambitious educational change management process regarding the effective use of technology in schools in the United Arab Emirates, as part of the advancement of smart services across a range of sectors. At the close of the 2015-16 academic year the MBRSLP was operating in 202 schools, with a total of 5,884 teachers and 42,239 students participating in the programme. In addition to the expansion, the programme also delivered a professional development programme to all principals in participating cycle 2 and cycle 3 schools, providing practical training for how principals can lead strategically with technology in their schools and effectively assess their own practices.

At the start of the 2015-16 academic year there was a fundamental change in the allocation of responsibilities between the MBRSLP and the Ministry of Education, as part of a long-term plan to integrate the strengths of the programme comprehensively within the mainstream provision. The transition of programme operational responsibilities took place throughout the year. Alongside this, throughout 2015-16 the MBRSLP has operated within the context of significant changes in the wider educational landscape across the United Arab Emirates, namely the re-organisation of the Ministry of Education and the rapid renewal of the national curriculum.

A particular strategic priority for the MBRSLP in 2015-16 has been the development and roll-out of the in-depth principal professional development programme and associated

SMART School Transformation Framework. The programme provides practical training in how principals can lead effectively with technology in their schools and assess their own practices. At the end of the academic year approximately 220 principals and vice principals had participated in the training, with four days of the six days of training completed. 90% of principals agree that the professional development programme is already having a positive impact on the quality of their school, and 96% anticipate that the programme will have a positive impact in the future. Similarly, 90% of principals believe that the SMART School Transformation Framework is enabling them to lead their school more effectively. These findings are particularly noteworthy considering the considerable external pressures that principals were facing in the 2015-16 academic year. Indeed, many principals requested that the training be extended in future years to include a greater number of days. The professional development programme and school transformational framework has worked very effectively throughout the changes of 2015-16 and will have an increasingly central role to play in the future of the MBRSLP, ensuring that schools have the capacity to use technology strategically to manage their own change process.

During the 2015-16 implementation there have been technical challenges in the programme relating to limited in-school connectivity and increase in device failure. Alongside this have been capacity challenges relating to the reduction of teacher training and in-school support for teachers. In combination, these issues have had an adverse effect on overall usage and led to a reduction in the level of active participation in the MBRSLP in some schools. It is clear that in order for the programme to operate effectively the technological enablers have to be both sufficiently resilient and efficient, and accompanied by adequate and on-going school-based support. In future years the strategic focus on principal professional development should extend to teachers in order to sustain their motivation and capacity to engage in the programme.

While the technical limitations of the 2015-16 implementation have led to some decrease in teacher and student usage and engagement in the programme, there is no reason why the usage will not increase again in future as these challenges are overcome. Indeed, it is remarkable that despite the technical challenges regarding connectivity and device support, there are still increasing levels of ICT-facilitated collaboration in the classroom, and increasing levels of teacher and principal conviction regarding the positive impact that ICT has on student learning outcomes. This is demonstrated throughout the report analysis and exemplified through the principal and teacher responses regarding the impact of the programme on learning outcomes and quality of teaching.

A total of 83% of principals and 70% of teachers report that the MBRSLP is having a positive impact on student learning outcomes. This is particularly noteworthy because it is an increase from previous years. In addition, both principals and teachers anticipate that the positive impact on learning outcomes will grow in the future: 92% of principals and 79% of teachers anticipate that the programme will be having a positive impact on learning outcomes one year from now. Similarly, 76% of principals and 84% of teachers believe that the programme has led to an increase in the quality of teaching. 76% of principals and 73% of teachers believe that it has led to an increase in the quality of student learning. These figures indicate widespread confidence in the positive impact of the programme on the quality of teaching and learning in the minds of both principals and teachers.

Throughout the research there are positive examples of the way in which the programme is leading to substantive changes in pedagogical approach in the classroom.

There is a widely held belief from both teachers and principals that the MBRSLP is playing a significant role in helping education to make progress as a sector, and in comparison with other sectors in the United Arab Emirates. Indeed, 90% of teachers and 85% of principals said that they think the MBRSLP is helping the education sector to catch up with other government sectors in the use of smart services. The on-going strategic investment into educational change will continue to position the United Arab Emirates as a leader within the region. This is beginning to be demonstrated, as throughout 2015-16 the MBRSLP has gained increasing international recognition which brings opportunities to give advice, share experiences and mentor counterparts in other countries. It is particularly noteworthy that the International Telecommunications Union has recognised the United Arab Emirates as a regional knowledge hub for smart learning because of the work of the MBRSLP. This is a considerable achievement in the relatively short lifespan of the programme thus far, enabling the United Arab Emirates to increase its participation in the global dialogue regarding innovative approaches to education.

The rapid growth of the MBRSLP and its integration into the teaching and administration of schools within the past three years has demonstrated a high level of commitment to educational change. A central component of the MBRSLP change mandate is to build capacity within the whole education system for the effective use of technology. It can be seen from the experience of the programme, and from similar initiatives in other countries, that building such capacity requires significant time and sustained effort. In 2015-16 the MBRSLP has effectively managed to integrate services with the Ministry of Education, overseen an expansion in programme reach, implemented a highly effective principal professional development programme, and maintained principal and teacher motivation for the programme in the midst of significant technical limitations. Alongside this is increased evidence that the programme is beginning to contribute to substantive pedagogical innovation in classrooms. These are notable and rare achievements which may lead to significant future impact on learning outcomes if the current challenges can be overcome and commitment to the programme can be sustained.

Acronyms

HP	Hewlett Packard
ICT	Information Communication Technologies
ICT4D	Information Communication Technologies for Development
IWB	Interactive White Board
ITS	IT Specialists (previously 'Adoption Team')
LMS	Learning Management System
MBRSLP	Mohammed Bin Rashid Smart Learning Programme
MoE	Ministry of Education
PDP	Professional Development Programme for Principals
PMO	Prime Minister's Office
SIS	Student Information System
SLG	Smart Learning Gateway
TCO	Total Cost of Ownership
TRA	Telecommunications Regulatory Authority

Note on transliteration of Arabic terms

The report has a number of Arabic place names and other terms that have been transliterated according to the standards presented in official documentation. This is in most cases slightly divergent from standard Arabic transliteration schemes, at times reflecting local pronunciation (e.g. Sharjah rather than shārqa). There are some occasions where there are also differences in the presentation in received documentation. The report aims to use the names and terms consistently, however external readers of Arabic may find the transliterations less accurate than desired (e.g. inadequate representation of ع), due to the importance of using the data provided for the research, which focused primarily on usage over accuracy.

1. Introduction

1.1. Overview

This research provides an overall review of the effectiveness of the MBRSLP during the academic year 2015-16. Its aim is to provide all stakeholders with an independent assessment of the successes of the initiative, and ways through which it can further be improved. The Mohammed Bin Rashid Smart Learning Programme (MBRSLP) is a collaborative initiative between the Ministry of Education (MoE) and the United Arab Emirates Telecommunications Regulatory Authority (TRA) in cooperation with the United Arab Emirates Prime Minister›s Office (PMO). The Programme was launched in 2012 by His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice-President and Prime Minister of the United Arab Emirates and Ruler of Dubai.

The programme began in 2012 with a roll-out for Grade 7 students in eight pilot schools (Phase 1). In April 2013 six schools were added (Phase 2) and in September 2013 107 schools were added (Phase 3). In September 2014 a further 26 schools were added and the programme was extended to Grade 8 and Grade 9 students. At the close of the 2015-16 academic year the programme is operating in 202 schools, reaching 5,884 teachers and 42,239 students.

The mission statement of the MBRSLP:

'To deliver world leading education technology solutions for the United Arab Emirates education community in order to drive up the educational achievements, excellence and creativity of our students.'

The MBRSLP has six overarching objectives, relating to each of the key stakeholders within the education community. The objectives are to:

- Enable the Ministry of Education to deliver its objectives by providing technology enhanced teaching and learning environments in United Arab Emirates schools

- Enable students to improve the quality and range of their learning opportunities

- Enable school principals to improve the educational effectiveness of their institutions

- Enable teachers to plan, track and deliver more personalized learning and effective teaching

- Enable parents to more effectively engage in and support their child's learning

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Table 1. The mission statement of the MBRSLP.

1.2. Objectives of the research

The overall purpose of the research is to provide a review of the development of the MBRSLP during the 2015-16 academic year. It builds on two previous studies entitled 'MBRSLP Research 2013-2014' (published in July 2014) and 'MBRSLP Research 2014-2015' (published in July 2015). The specific objectives of the research are to:

- provide an overview of the programme, documenting the progress that has been made, the challenges faced, and the opportunities ahead

- contribute to the evidence base for the programme, building on the studies from 2013-14 and 2014-15

- assess the ongoing development in teacher, principal and student knowledge, attitude, practice and usages patterns within the programme

- provide the programme leadership with accurate information and insight regarding the 2014-15 implementation

- be a valuable resource for principals, teachers and other relevant stakeholders

The research is a continuation of the long-term strategy of the MBRSLP to invest in research and evaluation to inform on-going programme development. The research therefore contributes to building a robust evidence base for the MBRSLP. It does this through:

- capturing the learning within all the activity that is taking place

- improving the practices within the implementation

- sharing the knowledge with external parties

1.3. Report structure

The report explains each aspect of the methodology employed in the research, describing the approach to the online surveys and school visits (Chapter 2). It then provides a brief review of the wider context within which the programme is situated (Chapter 3). Following this is a detailed review of the deployment, support and usage patterns regarding the MBRSLP in 2015-2016 (Chapter 4). The report then focuses on the substantive analysis of the research, considering the changes in perceptions, attitudes, and practices of principals (Chapter 5) and teachers (Chapter 6). Following this is a brief review of the role of the MBRSLP in provision of smart services (Chapter 7). The report closes by summarising the key findings and offering recommendations for the future of the programme and the sector (Chapter 8).

2. Methodology

2.1. Introduction

The research adopted a mixed-methods approach using both quantitative and qualitative techniques. The combination of qualitative and quantitative methods ensured that the research engaged with the depth and breadth of the programme, triangulating findings wherever possible and engaging with a wide range of perspectives and experiences. The combination of online surveys and schools visits ensured that the research captured a broad perspective of principal and teacher experiences as well as more in-depth insights from a smaller sample. Throughout, the research emphasis was placed on actively listening to MBRSLP stakeholders so as to understand the nuances of the successes and challenges encountered during the 2015-16 operations.

2.2. Online surveys

Rationale and approach

Two online surveys were conducted, one sent to all participating principals and one sent to all participating teachers. The online surveys ensured that all principals and teachers had the opportunity to share their perspective and contribute to the research process. The online surveys were conducted in Arabic, hosted by Fluid Surveys, were compatible with mobile devices, and were distributed through the MBRSLP team and open for responses from 20 June to 22 July. Both principals and teachers were sent emails reminding and encouraging them to respond to the surveys.

Principal survey

The online principal survey was distributed to principals of all 202 participating schools. The survey had full or partial responses from a total of 149 principals and vice principals, which suggests a representation of up to 74% of all participating schools. The survey was more detailed than 2014-15, with a total of 39 questions (rather than 28 in 2014-15). There were responses from all six participating Emirates, and of the 149 responses, 53% were female and 47% were male. The principals were given the option of having their vice-principal complete the survey if preferred, but only five of the responses utilised this option.
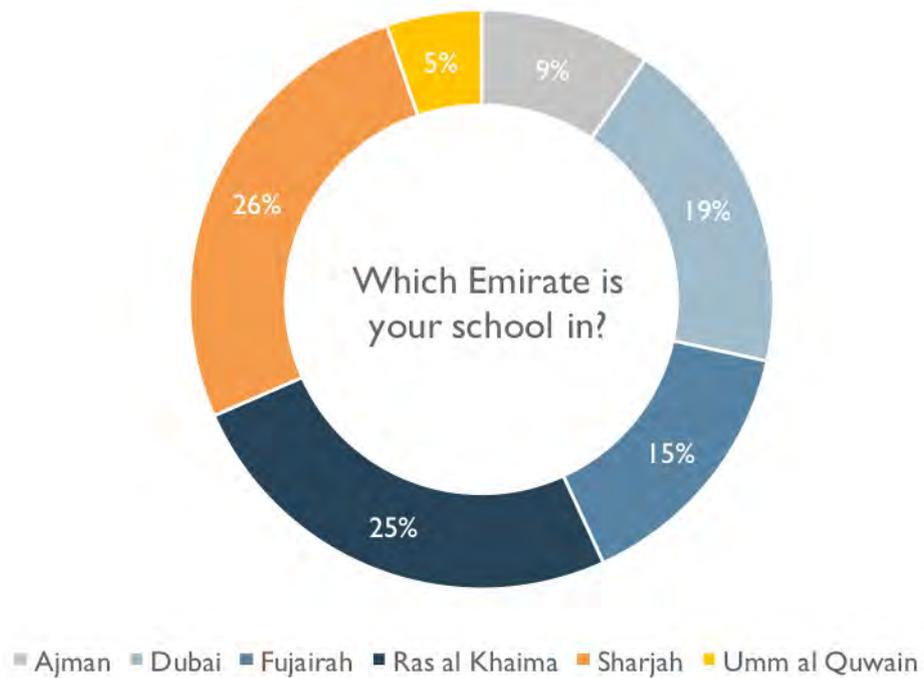
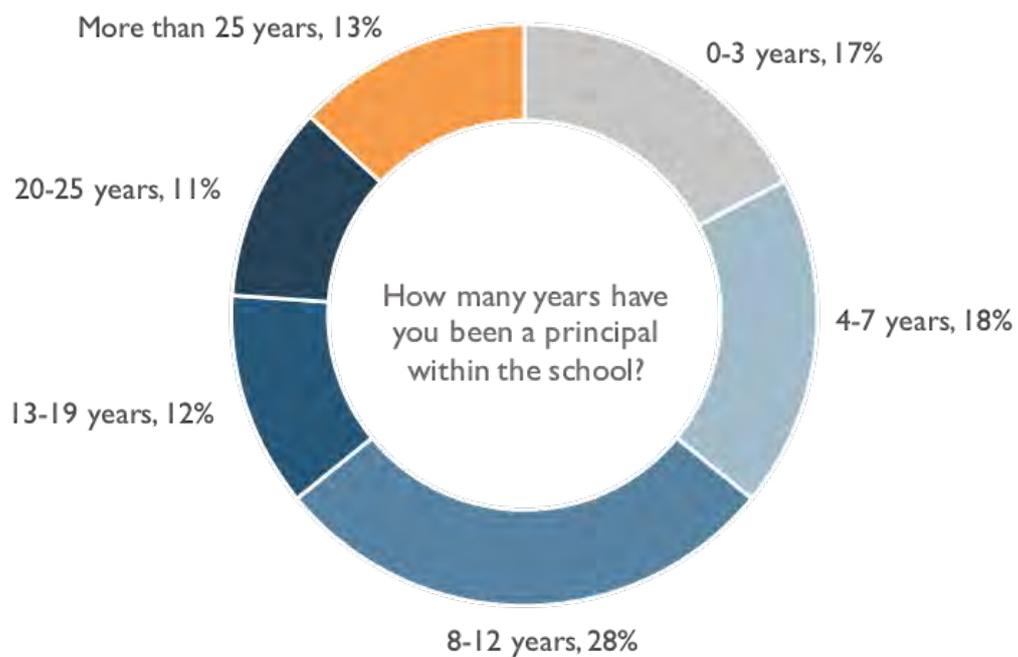Figure 1. Percentage of principal survey responses, by Emirate

Figure 2. Percentage of principal survey responses, by years of experience in current role

The online principal survey asked all principals participating in the MBRSLP to give detailed feedback regarding their engagement with the programme, and their management of its use by teachers and students in their schools. The survey investigated seven key areas: impact on learning outcomes, impact on the quality of teaching and learning, training and professional development, level of engagement with ICT, comparison of subjects, comparison of MBRSLP tools, and effectiveness of MBRSLP tools.

Teacher survey

The online teacher survey with 30 questions was distributed to all teachers participating in the programme, and 533 responses were received. The online teacher survey was also conducted in 2013-14 and 2014-15, so the 2015-16 survey was the third data set. This enabled three-year comparative analysis to be conducted regarding teacher perspectives and responses. To facilitate this comparison, a set of questions have been kept consistent throughout the three years, and other questions added in 2015-16 in response to specific emerging areas of interest. Teachers responded from all six participating Emirates, and from 162 of the 202 participating schools. Of the respondents, 42% were female and 58% were male.
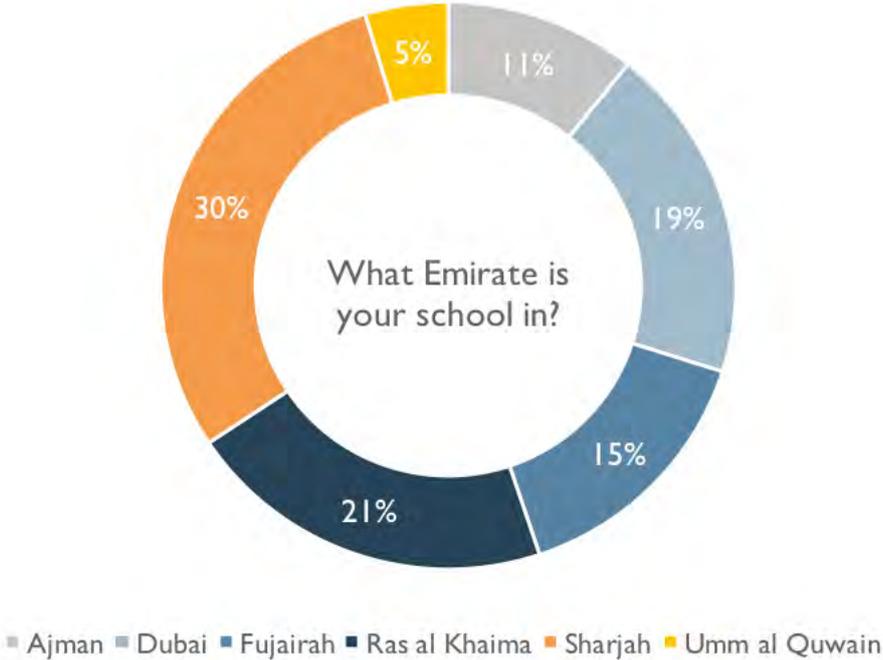

Figure 3. Percentage of teacher survey responses, by Emirate
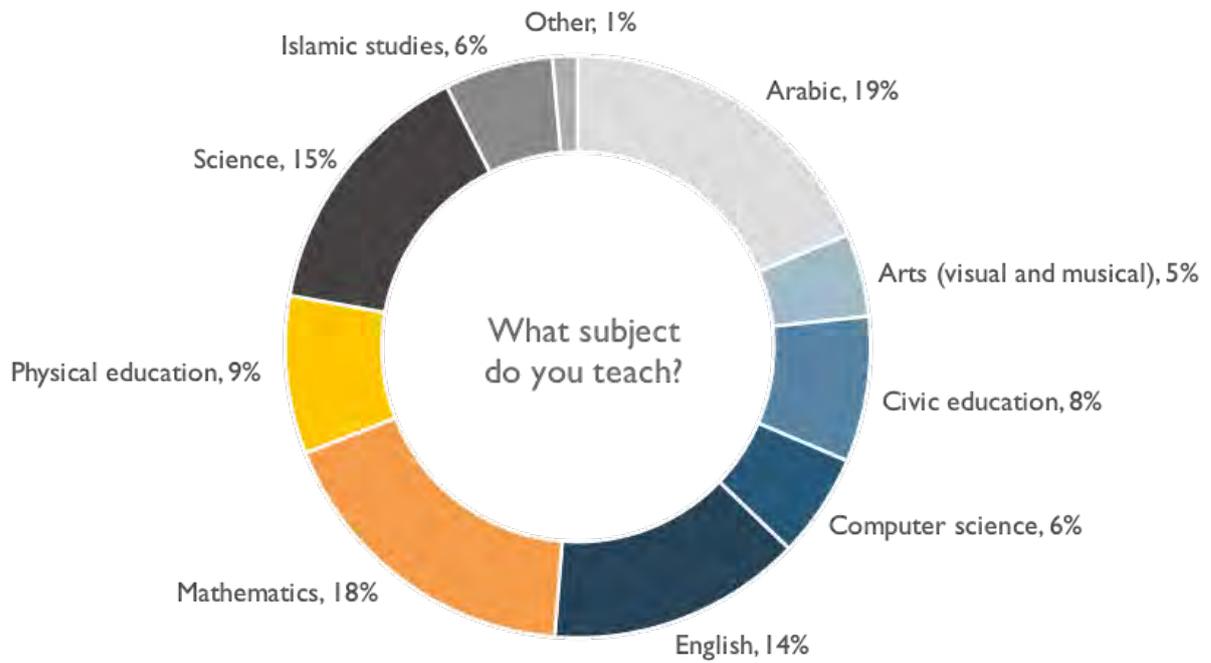
Figure 4. Percentage of teacher survey responses, by subject taught
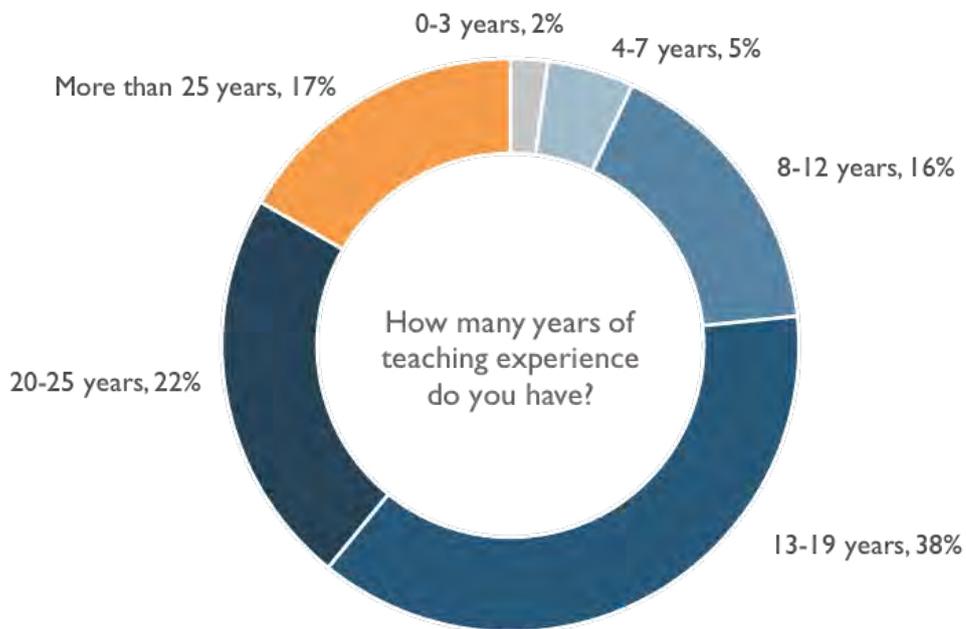
Figure 5. Percentage of teacher survey responses, by years of teaching experience

Of the teachers who completed the online survey this year, 32% reported that their school had been participating in the MBRSLP for less than 1 year, and a further 24% said that their school had been participating for 1 year, while 45% reported that their school had been participating for more than 1 year.
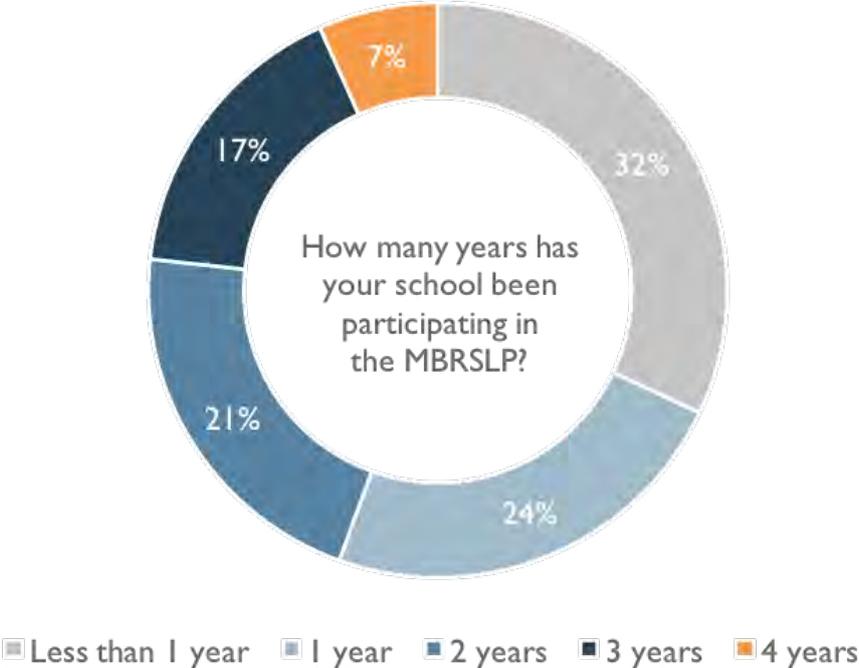
Figure 6. Percentage of teacher survey responses, by schools'
years of participation in the programme

The online teacher survey provided an opportunity for all the teachers participating in the MBRSLP to give detailed feedback regarding their experiences of the programme. This is the third year that teachers have completed the survey, and the results from the 2016 survey are compared to those from 2014 and 2015 where appropriate. The survey focused on seven key areas: impact on learning outcomes, impact on teaching and learning, teacher confidence in ICT, impact on workload, enjoyment of ICT, ease of use of the MBRSLP, and the importance of the tools provided in the MBRSLP.

2.3. School visits

Sampling strategy

The research team selected 12 schools for face-to-face visits. The schools that were visited were selected by the research team without involvement of the MBRSLP team. The schools visited were selected to be as representative as possible of all the participating schools. This meant that schools were visited from all participating Emirates, both girls and boys schools were included, and a range of high and less-high achieving schools. Of the 12 schools visited, 5 had been visited before and 7 were new schools for 2015-16.

Character of school visits

The principals of each selected school were notified of the visit of the research team in advance through a letter sent from the MBRSLP team. Each school visit lasted for approximately two hours and involved either two or three members of the research team. Each school visit consisted of an individual interview with the principal or vice principal, a group interview with participating teachers, a general observation of the school and technical infrastructure. The research activities were conducted in Arabic or English according to the preference of the participants. All participation in the school-based research activities was voluntary.

Interviews

Interviews were conducted with principals and teachers in each of the 12 schools. The principals of each school were interviewed individually and where the principal was not available the vice principal was interviewed instead. The teachers were interviewed in groups, with a total of 59 teachers participating. Each of the interviews lasted between 30 and 60 minutes and was conducted in either Arabic or English as requested by the interviewees.

The in-school interviews were conducted in a structured manner while allowing for participants to explore particular themes that were considered noteworthy or that reflected their areas of expertise and involvement. The group interviews with teachers also provided opportunity for dialogue between the teachers as well as directly with the interviewer.

2.4. Interviews with senior stakeholders

In total, 18 interviews were conducted with senior members of the MBRSLP team and with representatives of relevant partner organisations. Each of the interviews lasted for between 30 and 120 minutes and were conducted in a manner to ensure that the interviewee could focus their responses on their particular areas of expertise and responsibility.

2.5. Document and statistical data review

As in previous years, the research process involved a thorough review of the relevant MBRSLP documents, reports and information provided by partner organisations. The information from these background sources is included throughout the report.

2.6.   Use of research data in the analysis

The data from the closed questions in the online surveys provided the foundation for the quantitative analysis of the programme—much of which is expressed graphically throughout the report. The data from the open questions in the online surveys was analysed using a rigorous coding mechanism to identify dominant trends and themes in the responses. The coded qualitative data, in combination with the responses to the face-to-face interviews, provided the foundation for the narrative analysis of the study. The responses from the various research activities have been anonymised for the benefit of the participants. However, within the narrative of the report they are given a descriptive identifier for the benefit of the reader to identify their role, location and gender.

3. Context for the research

3.1. Introduction

This chapter engages with the contextual factors that have had an impact on the MBRSLP in 2015-16, explaining the broader educational context within which the programme is situated and summarising good practice from the broader literature. This is necessary in order to understand the detail of the opportunities and challenges encountered and the implications of these on the 2015-16 implementation. It begins by identifying the transition in responsibilities and delivery of some technology services within the programme that has taken place in 2015-16. It then describes the important changes that have taken place in the Ministry of Education, and particularly the development and deployment of the new curriculum. It closes with a brief review of four principles from the literature regarding the effective integration of technology into education systems.

The content of chapter 3 and chapter 4 is based largely on interviews with the MBRSLP team and implementing partners, and the statistical data provided to the research team. It does not draw significantly on the data from the school visits or online surveys as this is the focus of chapters 5 and 6. The contextual review is included near the beginning of the study because it situates all of the other findings of the research. None of the content is presented as direct quotations or attributed to a specific individual, but all of it is based on the 18 interviews conducted with the MBRSLP team and implementing partners.

3.2. Programme responsibilities

At the start of the 2015-16 academic year there was a transition in aspects of programme responsibility and delivery of technology services between the MBRSLP and the Ministry of Education, as part of a long-term plan to integrate the strengths of the programme comprehensively within the mainstream provision. The MBRSLP is now re-positioned to support the Ministry of Education in continuing to implement the effective use of technology across all schools in the UAE. The transition of programme operational responsibilities was an ambitious and complex process that took place throughout the year. The strategic plan for the migration was designed by the MBRSLP and implemented in a phased approach.

Alongside this, throughout 2015-16 the MBRSLP has operated within the context of significant changes in the wider educational landscape across the United Arab Emirates. These changes have inevitably had an impact on what it has been possible for the programme to accomplish. There has been a substantial re-organisation of the ministry, with the merging of departments between higher education and non-higher education: this has meant that communication with the relevant individuals within the ministry has not always been easy. Linked to this, and with particular consequence for the MBRSLP, has been the Ministry of Education's ambitious work to undertake a complete renewal of the curriculum in a very short space of time.

3.3. Introduction of new curriculum

The curriculum change of 2015-16 took place within a pre-existing change plan for the curriculum that was gradually being introduced. At the beginning of 2015-16 the new curriculum was already being implemented in Grade 7 and Grade 10. But it was then fast-tracked by the in-coming Minister of Education to be implemented more quickly than originally planned and across all grades. The rapidly implemented change in the curriculum has had major implications for the provision of appropriate content within the MBRSLP. There have been particular challenges for teachers in trying to access the new syllabus for specific subjects. In addition, various subjects have been amalgamated, which again has led to challenges regarding appropriate content provision, especially for digital content. The main ways that the introduction of the new curriculum has affected the programme are summarised below in order to contextualise the subsequent review and analysis.

First, the change in the curriculum has led to a significant increase in workload for teachers with a weekly increase from 18 to 24 classes taught. The increased teaching load, combined with the time required to adjust to the new curriculum has meant that the teachers had an unusually heavy workload at the beginning of the academic year. This meant that the teachers did not have much time left for engaging with any other activities, including the MBRSLP. As a result it was not possible for the MBRSLP to be as proactive in engaging with the teachers, because they were already very stretched. In addition, the 'champion teachers' in whom the MBRSLP has invested significantly now have less capacity to undertake the relevant activities to promote and support the programme within the schools.

Second, as a result of the new curriculum, the lessons that teachers had previously built using the learning management system (LMS) are no longer all fully in line with the new curriculum requirements. This has meant that much of the content that teachers had produced now needs to be re-built and updated to match the new requirements. This requires significant motivation and investment of time from teachers, and most teachers have simply not yet been able to do this.

Third, the Ministry of Education process of producing digital content that is aligned with the new curriculum has been delayed: the content was not available on teacher and student devices for much of the year. This has meant that much of the classroom usage has been dictated by individual teacher innovation rather than being built on the provided content. As a result the overall usage of the devices in some classrooms has been lower than in 2014-15.

Finally, associated with the new curriculum, the Ministry of Education has introduced a new revised approach to in-service training of principals and teachers. This has had implications for the MBRSLP and the programme has at points had to reduce the implementation of its own training schedule because of limited principal and teacher availability. Similarly, the workload on principals and teachers as a result of the new curriculum and accreditation framework has also meant that some planned training has had to be reduced or delayed because the participants did not have the capacity to engage alongside all of their other responsibilities.

3.4.   Good practice in effective use of ICT in education

There is no clear consensus regarding the ideal approach to integrating ICT within education systems in order to improve effectiveness and enhance student learning outcomes. However, there is a developing research base that highlights good practices and four main issues summarised below are widely acknowledged to be important aspects of any effective programmes. Many of these are returned to in greater depth throughout the report and highlighted as particularly pertinent for the ongoing growth and development of the MBRSLP. The section below highlights the importance of these four issues that have been central to the programme: quality programme leadership, on-going support to in-school stakeholders, proactive integration, and appropriate phased approach.

First, high quality programme leadership is vital. There needs to be sufficient governance within the programme so that the necessary decisions can be taken and implemented (Solar et al. 2013). In addition, leadership can provide the clear vision, objectives and parameters, with understood scoping requirements from all partners, that a programme requires (Unwin and Wong 2012; Vanderlinde et al. 2012).

Second, programmes depend on significant commitment and support to in-school stakeholders. Effective integration of ICT requires school leadership to lead by example, motivate teachers and help create a culture that is receptive to change (Metsämuuronen et al. 2013). High quality and well-motivated teachers who are willing to engage with ICT are able to learn themselves and therefore help their students to learn (Beetham and Sharpe 2013; Hennessy et al. 2005; Uluyol and Şahin 2014). As a result of this, on-going in-school training and mentoring is vital throughout a programme (Unwin 2009; Cheung and Slavin 2011).

Third, programmes require pro-active and careful integration within the wider education and government system including consideration of curriculum, assessment and overall governance (such as curriculum, assessment, and governance) (Tondeur et al. 2007; Higgins et al. 2012). This also depends on well formed partnerships between related government ministries such as the Ministries of Education, Infrastructure, and Energy or their equivalents (Unwin 2009; Kozma 2008).

Fourth, programmes are most likely to be effective when introduced through an appropriately planned and phased approach. This requires programmes maintaining a long-term perspective, recognising the amount of time required to achieve systemic change (Müller et al. 2007; Buckner and Kim 2014). Similarly, this requires adopting an awareness of total cost of ownership from the programme outset, with the resources available to move towards a managed service (Zucker and Light 2009). A phased approach makes the necessary space for embedded monitoring, evaluation and research throughout the programme, informing the implementation, not simply providing a post-programme review (Wagner et al. 2005; Marriot and Goyder 2009; Rodríguez et al. 2010).

4. Review of deployment, support and usage

4.1. Introduction

This chapter provides a summary of the scope of the programme and the technology that was deployed in the 2015-16 MBRSLP implementation, including particular focus on the infrastructure and software provision. All associated information regarding the implementation of the principals' professional development programme is reserved for chapter 5.2.

4.2. Deployment scope and timing

The programme expanded significantly in 2015-16 both in terms of number of participating schools and overall number of users. Table 2 shows the total number of schools, students and teachers participating in the MBRSLP in 2015-16.

Emirate	Number of schools	Number of students	Number of teachers
Dubai	39	8,628	1,121
Sharjah	60	11,824	1,714
Ajman	20	4,524	605
Umm al-Quwain	11	1,575	269
Ras al-Khaimah	45	9,594	1,329
Fujairah	27	6,094	846
Total	**202**	**42,239**	**5,884**

Table 2. Numbers of schools, students and teachers participating in the MBRSLP in 2015-16

Table 3 below demonstrates the way in which the programme has expanded through three full years in operation, listing the number of schools, students and teachers participating. In summary, it is a remarkable achievement that the number of students involved in the MBRSLP has increased more than threefold from 12,775 in 2013-14 to 42,239 in 2015-16.

Emirate	2013-14			2014-15			2015-16		
	No. schools	No. students	No. teachers	No. schools	No. students	No. teachers	No. schools	No. students	No. teachers
Dubai	22	2,367	336	28	4,591	976	39	8,628	1,121
Sharjah	37	3,935	608	45	6,570	806	60	11,824	1,714
Ajman	11	1,359	184	14	2,722	273	20	4,524	605
Umm al-Quwain	6	565	80	8	1,091	126	11	1,575	269
Ras al-Khaimah	30	2,751	305	32	5,079	612	45	9,594	1,329
Fujairah	17	1,798	329	19	3,502	404	27	6,094	846
Total	123	12,775	1,842	146	23,555	3,197	202	42,239	5,884

Table 3. Number of schools, students and teachers participating in the MBRSLP, 2013-16

Figure 7 below demonstrates the way in which schools have been added to the programme, year by year since 2013-14, categorised by Emirate.
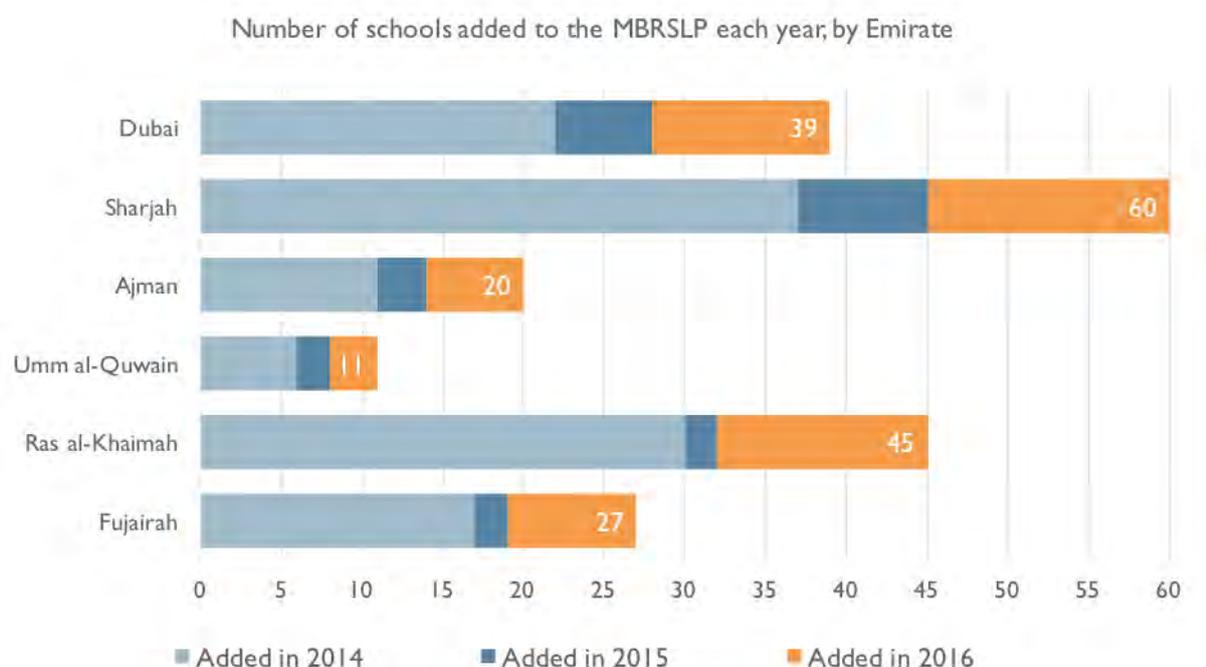

Figure 7. Number of schools added to the programme in 2014, 2015 and 2016

4.3. Ownership of deployment

There was a fundamental shift in the way that the deployment took place in 2015-16. The MBRSLP played a significant role throughout, but the Ministry of Education was responsible for the procurement process and had the ultimate decision regarding: choice of supplier, specification of device, means of delivery of devices into the school, wider physical preparation of the schools, and oversight of the helpdesks. The 2015-16 implementation adopted a staged approach, with most activities taking place across a six-month period between July 2015 and January 2016. The in-school infrastructure was installed gradually between July 2015 and January 2016. Teacher and student devices were deployed during the same period. The training of teachers took place between November 2015 and February 2016.

Drawing on the experiences in previous years, the MBRSLP programme was extended to 62 additional schools at the start of the 2015-16 academic year, with an additional 520 classrooms equipped with connectivity and interactive displays. This is a considerable achievement, especially given the wider context of change in the education system that took place during the year. Grade 10, the first grade within the cycle 3 schools, was incorporated as the additional grade within the programme for 2015-16, in line with the MBRSLP phased implementation strategy. In addition, in 2015-16, devices were distributed to all Grade 4, Grade 5 and Grade 6 Maths, Science and English teachers. Grade 7 teachers also received devices. It had initially been planned for Grade 7 students also to receive devices in 2015-16 but this was postponed because of budgetary limitations. It was

noteworthy that the introduction of Grade 10 teachers to the programme coincided with also having to engage in a large number of other activities relating to the new curriculum and other new policies and processes from the Ministry of Education. This meant that, although they had a high degree of enthusiasm regarding the programme, they had limited capacity actively to engage with learning how to use it.

4.4. Infrastructure and architecture

School networks were introduced to the new schools participating in the MBRSLP. The networks included core switches, access switches, wireless controllers, and wireless access points allowing for a 100 MB connection. Etisalat WAN routers connected each school to the network via a Forinet Firewall. In 2015-2016 the programme extended network coverage and internet access to key additional areas within the schools such as libraries, labs, teacher rooms, management areas and administration areas. There were some delays experienced with the introduction of the enhanced networks.

At the start of the 2015-16 academic year, there were various internet connections servicing the schools. Schools had different combinations of MBRSLP connections, including Ministry of Education connections from pre-MBRSLP, and independent ADSL connections established by the schools themselves. The MBRSLP connections had been established to service only the relevant parts of the school involved in the programme. However, there appears to have been an assumption in the Ministry of Education that the MBRSLP connection serviced the whole school. Consequently, an instruction was given to the service provider to withdraw the original Ministry of Education connection. Once this occurred, the service provider, Etisalat, immediately began to distribute the released bandwidth to other end users beyond the school in the geographical vicinity. This meant that once the problem was identified, there was still a long period before it could be rectified, meaning that many schools had very limited connectivity for a large part of the academic year. The MBRSLP team attempted to stretch the programme network to cover more of the schools, but this only served as a partial solution. At the end of the 2015-16 academic year, significant progress had been made but the anticipated introduction of single whole-school networks in each school had not yet been fully implemented. There is still sub-optimal connectivity in many schools, and the Ministry of Education are working to resolve this through the implementation of the new comprehensive service. It is anticipated that the connectivity challenges in the schools will be fully resolved by December 2016.

The specific equipment deployed incorporated the components listed in the table below.

User / location	Device
Student	Tablet / laptop
Teachers and principals	Laptop
Classroom	Interactive Smart Board with embedded computer and whiteboard
School	Network architecture including wireless access points, controllers and a firewall (this was a standard network model for all schools differing only in the number of access points and switches).
School connectivity (enhanced for 2015-16)	A fibre connection to schools set at 100MB (increased from the previous 8MB connection).

Table 4. Devices provided by the MBRSLP.

4.5.   Software provision

The suite of software tools in the MBRSLP was broadly similar in both 2014-15 and 2015-16. There were two notable additions for 2015-16. First, Learning Curve, a learning platform for the professional development of teachers and school principals was introduced to support learning, assessment, collaboration, evaluation and reporting. Second, Smart Majlis, the collaborative platform solution built for the programme that integrates with EduShare and facilitates increased interaction and joint working between teachers was rolled out.

One of the main challenges of the deployment resulted from the late decision to include Grade 10 students within the 2015-16 roll-out. Quite simply, there was not sufficient time to prepare the necessary new educational content for the devices. Because of this, at the beginning of the year, the Grade 10 students received devices without the content to support their learning. This was rectified in April 2016 when some appropriate curriculum-linked content was sourced for Grade 10 students. It was reported that the lack of available content led to many Grade 10 students not bringing their devices to school, and that the limited in-class use of the devices in Grade 10 was linked to the lack of any appropriate content.

The usage figures for the LMS have dropped in 2015-16 because of the aforementioned factors such as unreliable connectivity, broken devices, and decreased in-school support. It appears that the limiting factor is not the LMS itself but the surrounding issues. Significant focus is now on further developing the capabilities of the LMS with the aim of integrating all functionality for teachers within one interface that is simple to use, accessible on mobile, matches the curriculum and integrates with assessments. Towards the end of the 2015-16 academic year, the 'LMS and adaptive learning committee' was established, meeting every week and guiding the process with input from the Ministry of Education and the MBRSLP. The increasingly sophisticated use of the LMS should provide the Ministry of Education with the opportunity to understand the detail of what challenges teachers and principals are facing as they engage with the new curriculum. Having access to this detailed data through the LMS will enable the Ministry of Education to make appropriate adjustments to the curriculum.

4.6.   Additional programme innovations

There were various additional innovations implemented in the MBRSLP during the academic year. Three of these innovations are summarised below: the 'self-service system', Hayyakom, and the 'school enabler'. They are included to provide an illustrative overview and their effectiveness is not analysed here, neither are they the only innovative new additions to the programme in 2015-16.

A 'self-service system' was introduced which had the intention of enabling students and teachers to log their own incidents with the support desk rather than needing to report everything through the adoption team. The 'self-service system' encountered initial challenges but its introduction has laid a foundation for a more streamlined approach to communication in the future.

A service called Hayyakom was introduced by the MBRSLP on behalf of the Ministry of Education. Hayyakom provides an online training programme for teachers to build their awareness of local culture. This has so far been implemented in the 173 private schools across the United Arab Emirates, with more than 10,000 teacher accounts registered. Hayyakom uses the learning platform of the MBRSLP (Learning Curve). The service was launched in April 2016 and then upgraded with additional content in July 2016.

The 'school enabler' was launched in April 2016. This decision was taken in recognition that the significant reduction in in-school support was leading to a reduction of usage and engagement in the programme. The 'school enabler' focused on starting to reintroduce teams into the schools to encourage the teachers and re-motivate them in the use of the programme and the LMS. The enablement programme has focused on 40 schools thus far - with the intention of building a cohort that can demonstrate the effectiveness and then be used to motivate others.

4.7.   Review of support to schools

The ITS (IT Specialists) team was responsible in 2015-16 for providing the in-school support for teachers and principals regarding use of the technology and all applications. This team had 115 members until November 2015 at which point it was reduced to 28 members. The mandate of the team was restructured and it now operates under the mandate of the Ministry of Education.

One of the main reasons for the decreased usage levels of the MBRSLP in the classroom has been the reduced amount of in-school support that is available to teachers and principals. Previously there was significant in-school support, at a level of approximately one person per school, helping teachers to prepare their lessons, working alongside them and encouraging them to practice using it. Removing the support led to significant difficulties in the schools, as the teachers and principals were dependent upon this support in order to overcome the challenges encountered with using the technology. One stakeholder noted that the reduction of in-school support meant that the perception in schools changed and the MBRSLP became perceived as an optional, extra activity rather than a core provision. The reduction in the levels of in-school support took place at the request of the Ministry of Education, and minimal notice was provided. While this was a sub-optimal situation, it provided an opportunity for the programme to begin talking

with the schools about transitioning to a more self-sufficient approach. By the end of the academic year, there was widespread agreement among stakeholders regarding the detrimental impact of having such a reduction of in-school support, and a plan was established to re-introduce a higher level of support.

With the reduction in the capacity of the team, there has been a shift in focus to more strategic technical support rather than direct input for teachers. The focus is now on providing support that will help teachers and principals manage the change process, responding to questions and providing basic technical support. The reduction in the size of the team means that the ITS have only been able to visit each school approximately once per week. As a result of the decreased capacity, stakeholders report that the ITS team have a significant number of on-going challenges with broken devices, software issues, and delayed responses from the support desk. It has been a challenging transition for the schools to adapt to only having access to an ITS once per week. There remains a high degree of dependence on external input in order to make effective ongoing use of the technologies available and to full engage with the learning environment. The issue of school support is analysed in more detail in chapter 5.

A long-term strength of the MBRSLP has been the communications strategy between the programme and the participating schools. The communications team within the MBRSLP has ensured that the schools were kept informed regarding the detail of the programme, including what would be taking place and what would be required of them. However, despite their success, the MBRSLP communication team is no longer responsible for communicating directly with the schools, and this is instead channelled through the Ministry of Education. It appears that at present the transition in programme responsibilities has had a detrimental impact on the quality of communication with the schools which has had a knock-on effect on their levels of enthusiasm and engagement.

5. Changes in perceptions, attitudes and practices of principals

5.1. Introduction

This chapter examines the way in which the MBRSLP is influencing the perceptions, attitudes and competences of principals. It draws on the face to face interviews in the schools and the responses to both the qualitative and quantitative aspects of the online survey from the principals. The chapter begins with a focus on the principals' professional development programme and SMART School Transformation Framework. It then considers their perspective on how the programme is having an impact on learning outcomes and quality of teaching, followed by the impact on themselves, teachers and students. The chapter closes by focusing on the challenges that have been encountered in the programme this year, again from the perspective of the principals.

5.2. Principals: professional development programme

A strategic priority for the MBRSLP in 2015-16 was the development and roll-out of the in-depth professional development programme for principals. This is in recognition of the pivotal and long-term role of school leadership in ensuring the effective and sustainable integration of ICT into a school system (Ottestad 2013, Chang et al 2008, Muller et al 2007). The professional development programme is focused on the 'SMART School Transformation Framework', and provides practical training in how principals can lead with technology in their schools and assess their practices. This programme of activity builds on previous work relating to eMaturity, and is a central component within the overall long-term change agenda of the MBRSLP.

The purpose of the SMART School Transformation Framework is to help principals, and schools as a whole, to gain maximum possible benefit from the technologies available to them. It enables principals, and their leadership teams, to make strategic use of technology to bring long-term improvement to schools. The framework has been designed specifically for schools in the UAE and is fully aligned with the Ministry of Education Evaluation and Accreditation Framework. The intention of the framework is to provide principals, regardless of their level of previous competence, with a clear and structured approach to assessing areas of strengths, weaknesses and growth areas, in order to determine priorities and plan improvements across the whole school. The importance of a structured approach is well documented in other research (UNESCO 2011, Vanderlinde and van Braak 2012).

There are six strategic components within the framework: leadership; curriculum and resourcing learning; learning, teachers and teaching; student and family content; assessment and student progress; and operational provision and management. Each of the six components within the framework has a detailed narrative to describe it, and three or four sub-components providing additional detail focused on leadership. The final layer within the framework is a list of between six and 14 indicators linked to each component, each with an operational focus. Each indicator has a ranking attached to it to allow a scoring of 1-5 (1 is low and 5 is high). The indicators are used by the principals as

a periodic self-checking mechanism for the progress and development of their school. It is designed to support and empower structured self-review rather than being externally imposed. The intention is that it facilitates team building and reflective learning regarding the use of ICT within the school through involving all the school leadership team working together.

The SMART School Transformation Framework has been introduced through the MBRSLP principal professional development programme of 2015-16. The implementation of the professional development programme was subject to delays that resulted in no related activity in the first term of the academic year. However, the programme began in earnest in early 2016 and started with an intensive six-week period of planning and materials preparation. In April 2016 the programme then began delivering training to all principals in participating cycle 2 and cycle 3 schools. A total of 64 training days were conducted between April and June 2016, with the principals split into 16 groups and each having four days of training. In total, approximately 220 principals and vice principals participated in the training.

The professional development programme consists of six days in total of training. By June 2016, four of the six days had been completed with the final two in place for the coming months. Those principals who were not able to attend a training session in person were given the option of participating in a 60-minute call to have personalised coaching with a trainer and ensure maximum uptake. Each day of principal training follows a similar pattern and consists of four sessions. The first three sessions focus on strategies and examples of how the principals should lead, teach, assess, and engage parents, and many other things. The fourth session of the day introduces the transformation framework with a focus on principals using this to assess their own practice.

Principals were asked in the online survey and in school visits about the effectiveness of both the professional development programme and the SMART School Transformation Framework that underpins it. The large majority of principals 'agreed' or 'strongly agreed' that the professional development programme is helping them lead their schools more effectively (86%), with even more agreeing or strongly agreeing that the training will help even more in the future (96%). Ninety percent of respondents 'agreed' or 'strongly agreed' that the professional development programme is currently having a positive impact on the quality of their school, and 96% 'agreed' or 'strongly agreed' that it will have a positive impact in the future. Principals were also highly positive regarding the impact of the SMART School Transformation Framework, with 88% reporting they either 'agreed' or 'strongly agreed' that the framework is currently having a positive impact on the quality of the school. In addition, 90% 'agreed' or 'strongly agreed' that the framework is enabling them to lead the school more effectively. These findings are particularly noteworthy considering the considerable external pressures that principals were facing in the 2015-16 academic year as outlined in Chapter 4.

Principals' perceptions of the current and projected impact of the SMART School Transformation Framework and the Professional Development Programme for Principals (PDP)
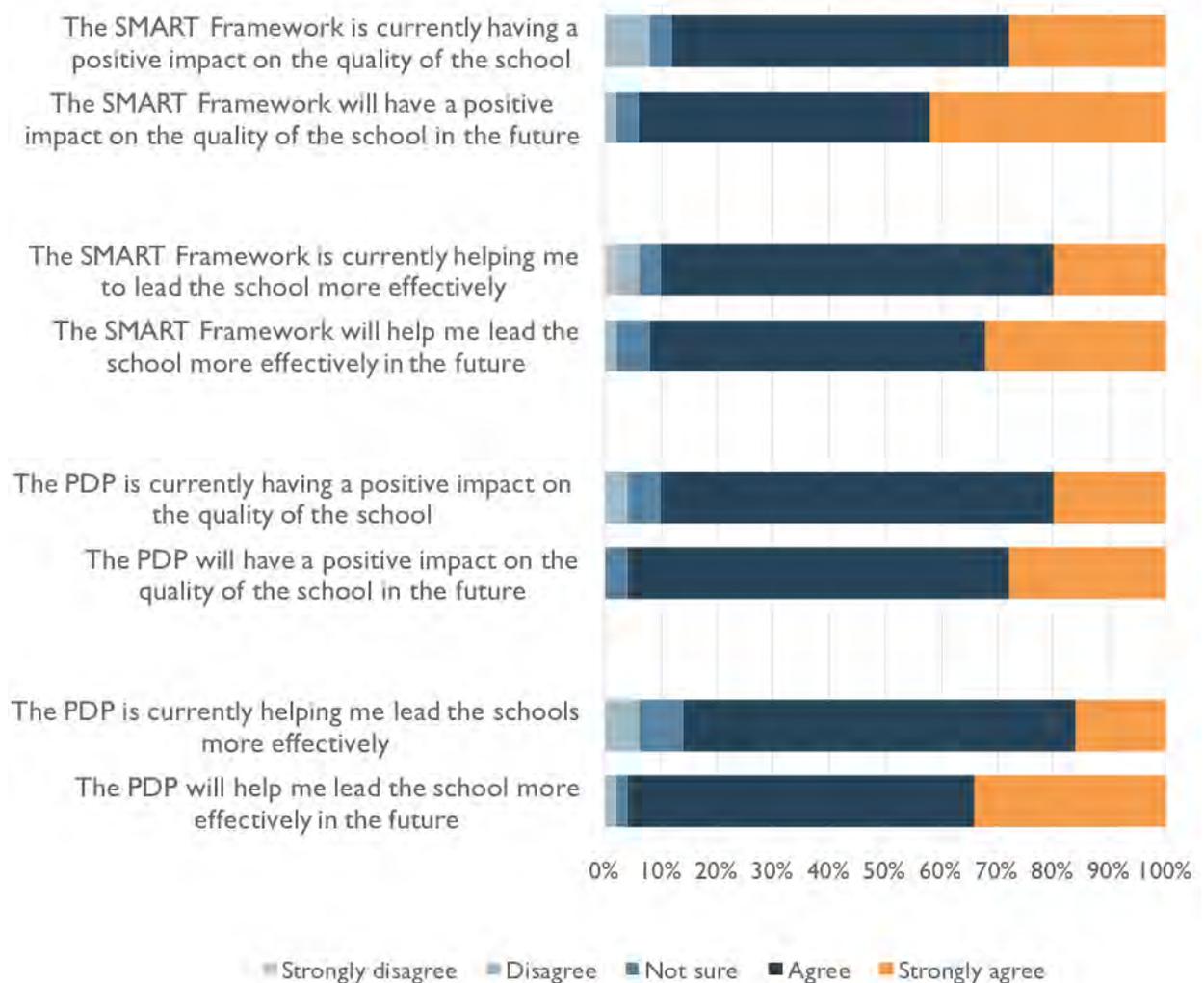

Figure 8. Current and projected impact of the SMART Framework and PDP.

Principals were also asked to give examples of the ways in which they were applying learning from the professional development programme to lead their schools. Four specific themes emerged: to undertake evaluation, to increase classroom visits, to monitoring student attendance, and to promote self-evaluation. Relating to the final theme, a female principal from a school in Ajman explained that as a result of the professional development programme, she had started '...preparing self-evaluation questionnaires for the teachers about the extent of their implementation of technology in teaching and learning in the classes and in their communication with students and their parents'. There was a clear overall message from the in-school interviews with principals that they have had a highly positive experience of the professional development programme in 2015-16. Indeed, the online survey demonstrated that principals who had not participated in the principal professional development programme were now less comfortable with ICT than they

had been previously. A larger percentage of untrained principals (19%) reported feeling nervous when using ICT after the MBRSLP compared to those who had participated in the programme (4%).

A similar sentiment emerged when principals were asked in the online survey what is the most significant improvement that they would like to see in the SMART School Transformation Framework in the coming year. In responding to this question, principals did not highlight anything that concerns the substance of the framework itself. Rather, they took the opportunity to emphasise the fact that they would like increased support (22%), more training (18%), and increased oversight (12%), each of which would enable them to further progress in operationalising the framework in their school.

Principals were also asked about potential future improvements for the professional development programme as a whole. Once again, the dominant response from principals reflected their high degree of satisfaction with the programme: they suggested that the programme could be improved by increasing the training available to them, both in terms of the length of the training and the number of people trained. A request to increase the volume of the training is particularly noteworthy and positive in a context where principals are already required to engage in a significant amount of other training. Additional suggestions made by principals during in-person interviews included changing the timing of the training, increasing follow-up support to assist them in implementing the training, and visiting and learning from other schools using other programme.

5.3. Principals: impact on learning outcomes and quality of teaching

A total of 83% of principals reported that the MBRSLP is currently having a positive impact on student learning outcomes. This represents an increase from 71% in 2015. A further 10% of principals were not sure, while 6% responded that the programme has not had an effect on improving learning outcomes. This reflects a significant change in perception, as before the MBRSLP started only 28% of principals strongly agreed that ICT could be used to improve learning. Furthermore, an even higher percentage of principals (92%) anticipated that a year from now the MBRSLP will have a positive impact on learning outcomes.

How do you feel about the following statements?
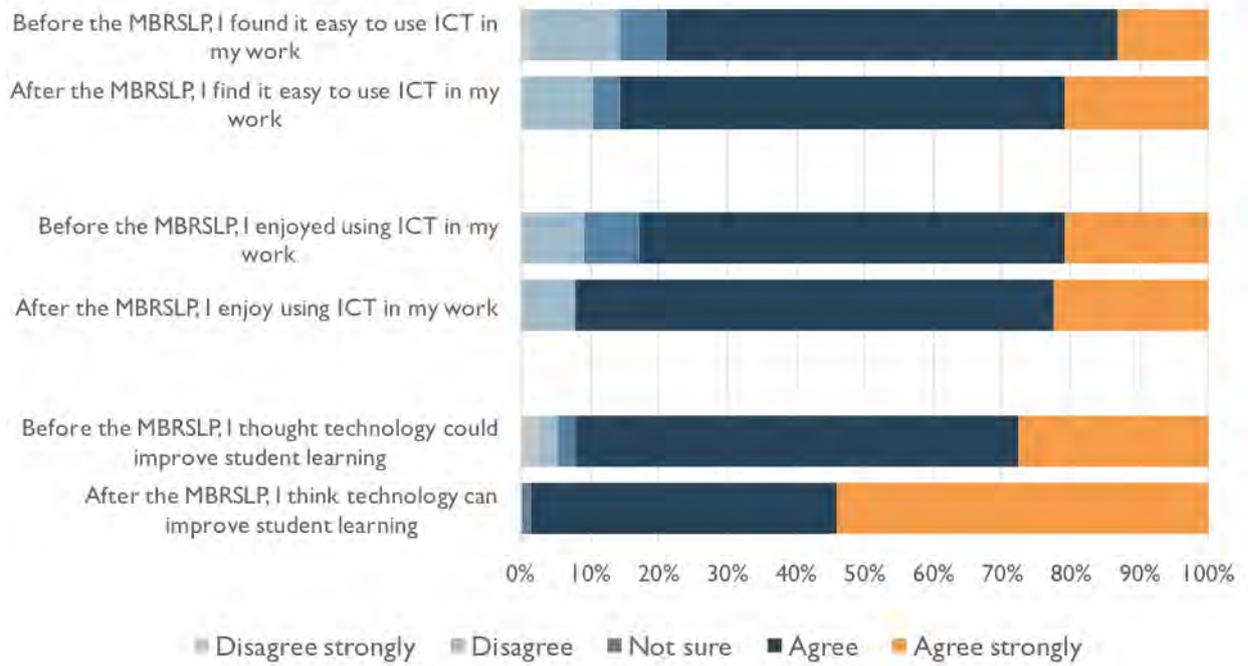

Figure 9. Principals' perceptions of ICT after the MBRSLP.

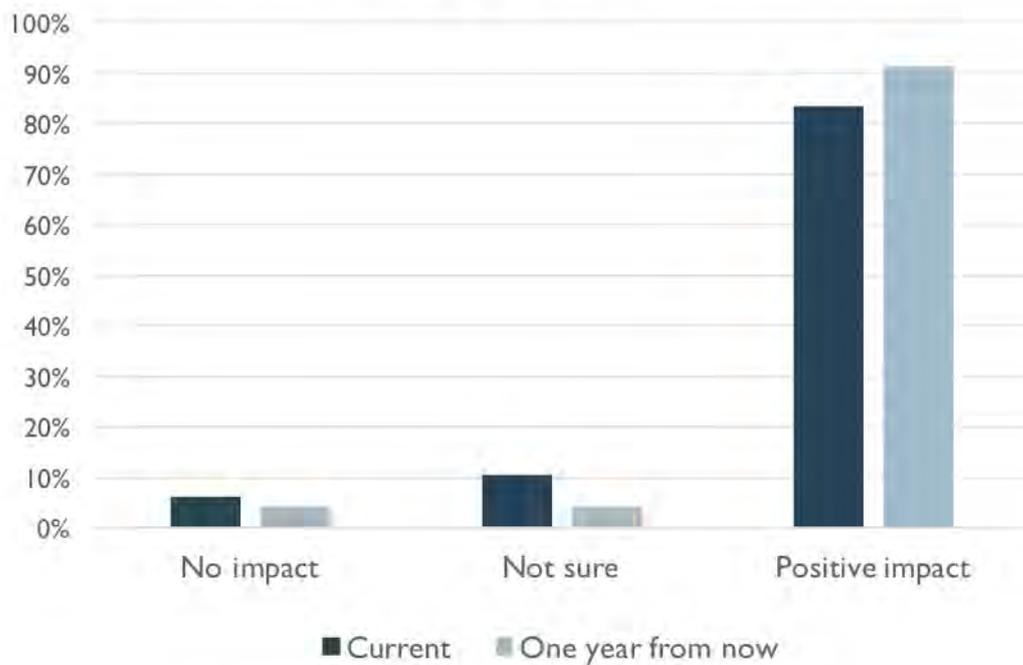## Is the MBRSLP having a positive impact on student learning outcomes?

Figure 10. Current and projected impact on student learning outcomes.

Principals were asked to expand on their responses, and explain why they thought there would be a positive impact on student learning outcomes one year from now. The main themes reflect the perception that the programme is making teaching, learning and management more efficient which will lead to a positive impact on student learning outcomes. Principals noted the impact on student learning outcomes would be because of the way technology makes the learning, teaching and management process more straightforward. A further group noted that the learning outcomes would increase because of the increased levels of communication and collaboration between students and teachers.

A majority of principals (76%) believed that the quality of teaching has increased as a result of the programme. Similarly, 76% said that the quality of student learning has increased because of the MBRSLP. These figures indicate widespread confidence in the positive impact of the programme on the quality of teaching and learning in the minds of those overseeing participating schools.
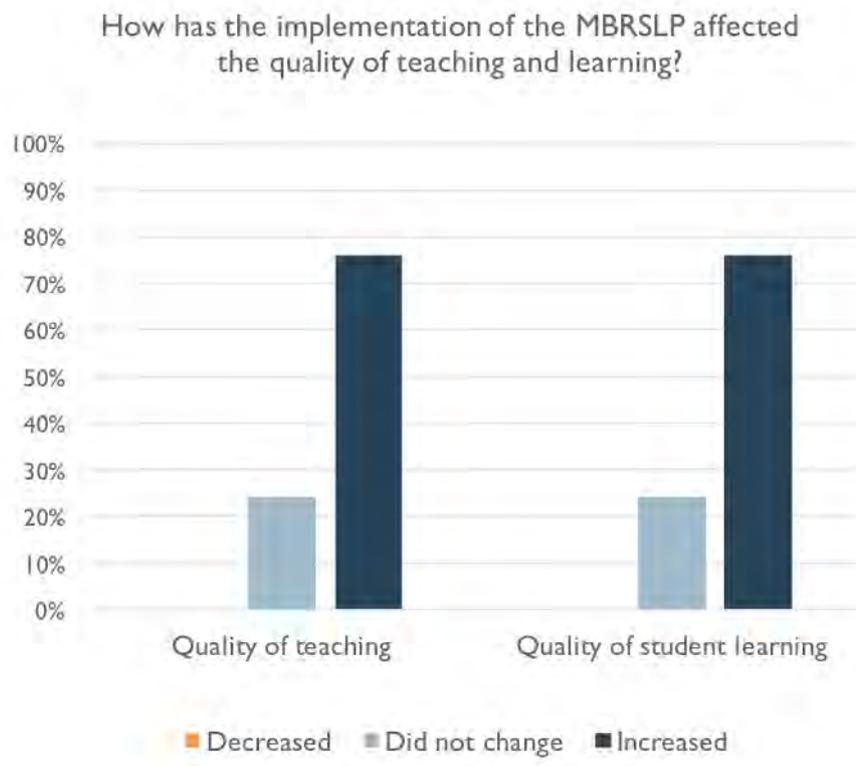

Figure 11. Impact on quality of teaching and student learning.

Specific examples of impact on teaching and learning came from a principal in Ras al-Khaimah who explained that the integration of ICT in education has led to the 'transition from traditional education to student-centred learning and participation' and a vice principal from a school in Sharjah who explained that the introduction of ICT has led to the availability of 'a diverse range of scientific sources and different ways of presenting and teaching them.' The principals who explained that education had become more engaging provided descriptive examples, such as a male principal from Ras al-Khaimah who noted education 'has become easier and quicker and far from the boredom of normal routine' and a male principal from Sharjah who explained that the programme 'has added creativity and distinctiveness'.

Having established that the majority of principals believe that the quality of teaching and learning has increased, the principals were asked in the survey to consider which specific subjects had benefitted the most and which benefitted the least from the MBRSLP. The pie chart below summarises the principals' responses. Maths was most widely cited (41%) as the subject that derives the greatest benefit from the MBRSLP. Science and English were the second most popular choices (both 26%). As expected, these three subjects were also least likely to be selected as the subjects that benefit least. Principals identified Islamic Education (35%) as the subject that benefitted the least, followed by Arabic Language and Physical Education (both 22%). This is likely to be because of the currently limited availability of digital content for these three subjects. It does not mean that the teachers of these subjects are in any way less willing to engage in the programme.
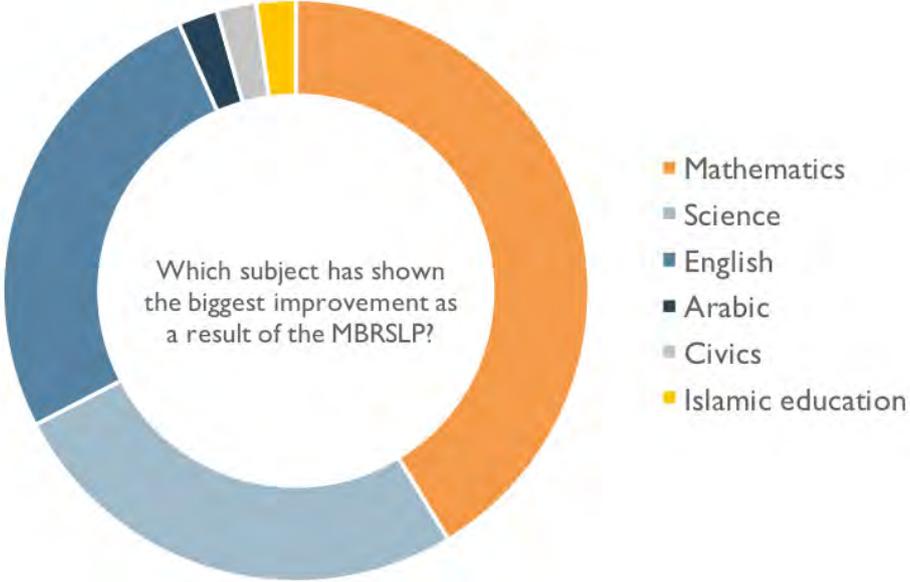

Figure 12. Principals' perspectives on the subject that benefits the most from the MBRSLP.
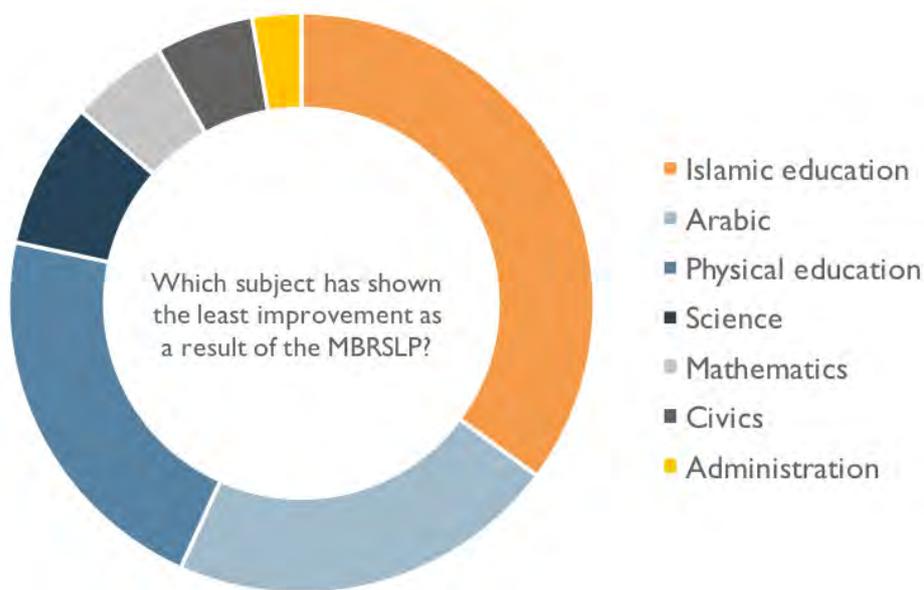
Figure 13. Principals' perspective on the subject that benefits the least from the MBRSLP.

Finally, principals were asked which of the tools within the MBRSLP were most important for enhancing teaching and learning. Their perspectives provided a broad view of the perceived importance of the tools across the school, independent of subject and grade. As demonstrated in the graph below, SmartAuthor, NetSupport and Ketab Studio were widely identified by principals as being among the top three most important software tools, included in 54%, 41% and 40% of responses respectively. This is likely to be a simple reflection of the tools which teachers have found most easy to incorporate into their day to day teaching.
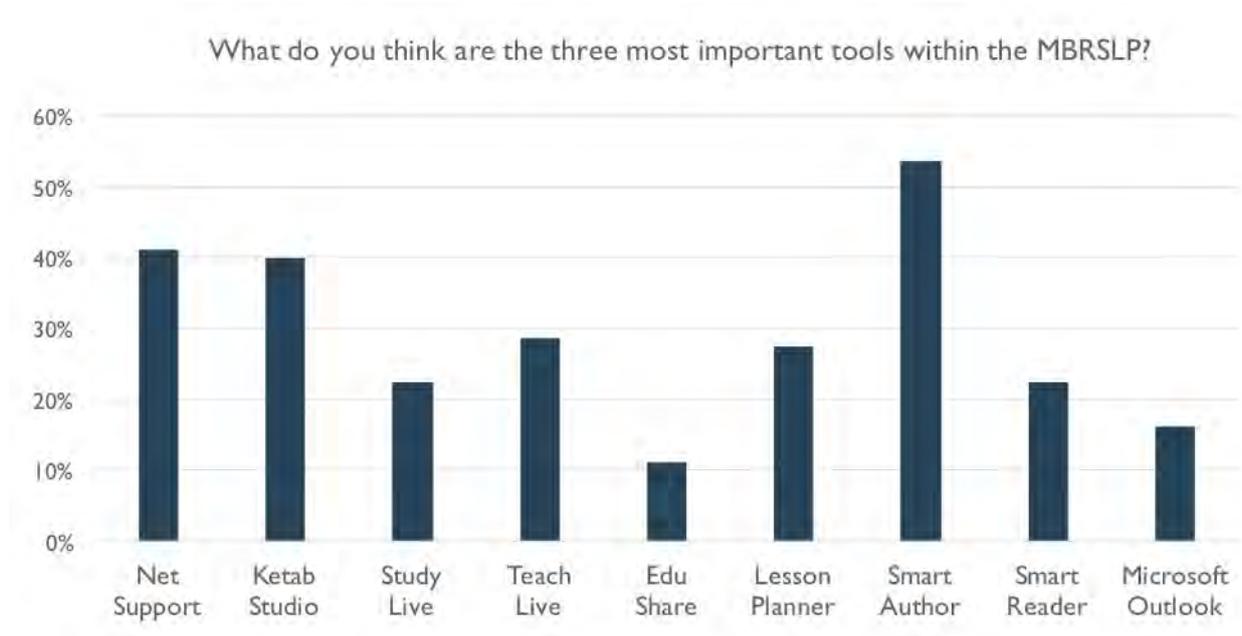
Figure 14. Principal perspectives on most important tools within the MBRSLP.

Related to this, the principals were asked for their view on the effectiveness of the different tools within the MBRSLP. It is notable that four tools received a 'very good' rating from 50% or more of the principals. The three most highly rated were the suitability of the Interactive White Board (IWB) (83% responding 'very good'), the reliability of the IWBs (56% responding 'very good'), and the suitability of the Smart Learning Gateway (SLG) for teachers (54% responding 'very good').

Figure 15. Effectiveness of aspects of the MBRSLP: Hardware and software.

Figure 16. Effectiveness of aspects of the MBRSLP: Training and technical support.

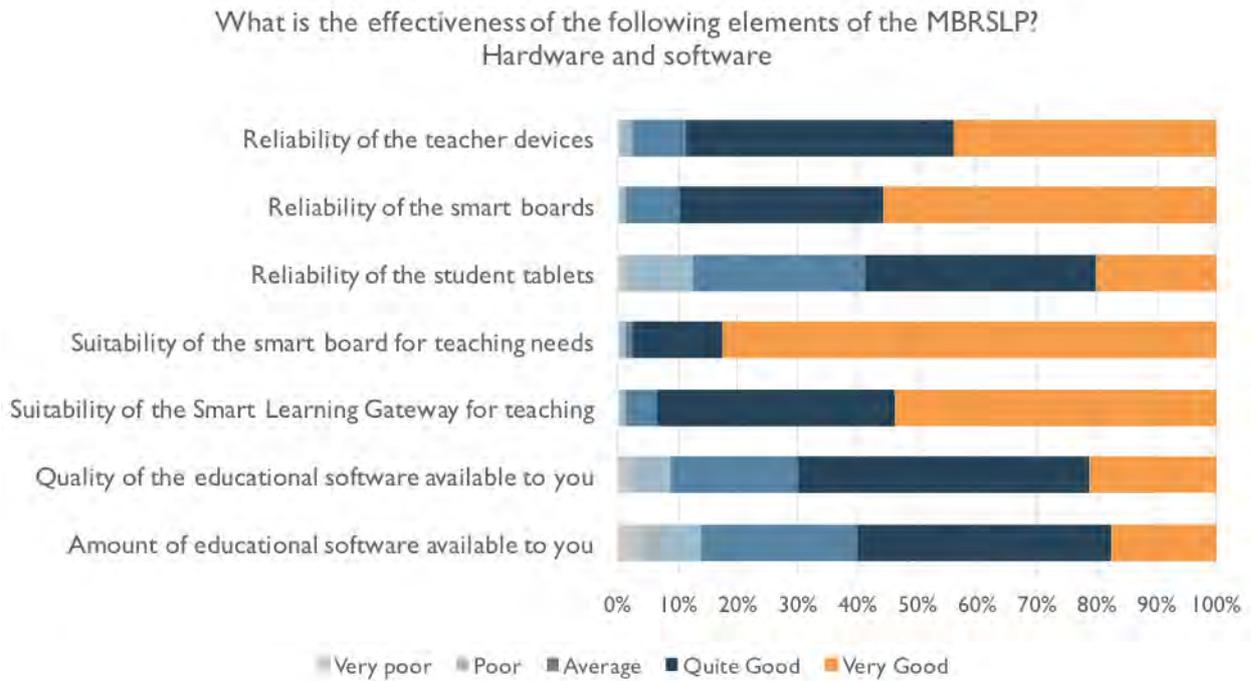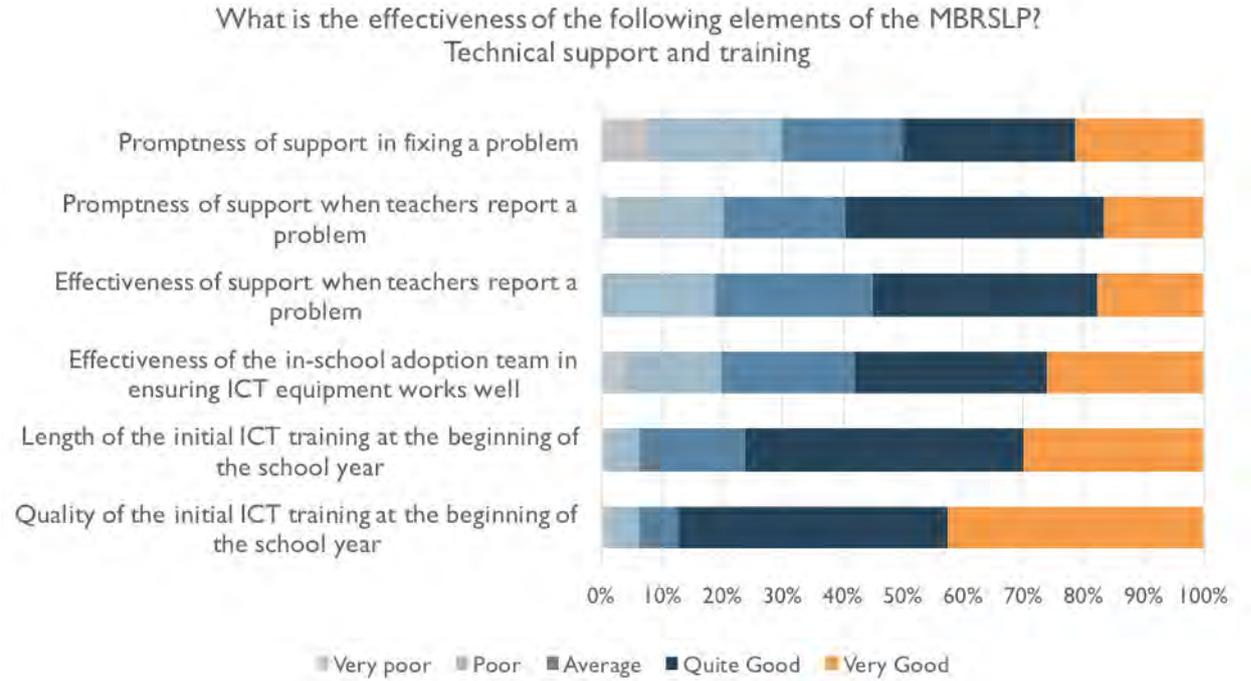The least positive responses were primarily related to the quality of the technical support, with 30% of principals reporting that the promptness of technical support in fixing a problem is 'poor' or 'very poor' (compared to 11% in 2015) and 20% reporting that the effectiveness of the ITS is 'poor or 'very poor' (compared to just 3% in 2015), demonstrating a significant decrease from the previous year. This indicates again that the focus of principals' criticism is on the technical implementation of the programme rather than the substantive tools of the programme.

5.4. Principals: impact on self, teachers, and students

Principals were asked about the most significant positive impacts of the MBRSLP on themselves, their teachers and students in their school. Overall, principals who responded to the survey remained remarkably positive regarding the impact of the MBRSLP in their schools.

The most significant positive impact stated by principals regarding the impact on themselves was their increased ability to communicate with staff, teachers and students more easily and effectively (16%). Fifteen percent reported the effective use of technology and employment of new pedagogical and administrative approaches as the most significant impact of the MBRSLP on principals. A male principal from Sharjah noted that the programme was 'strengthening the importance of the use of technology in the development of education,' and similarly, a female principal from Dubai expressed 'the ease of working with technology and the ability to easily communicate with all concerned saves time and effort'. Thirteen percent of principals reported that the most significant positive impact of the MBRSLP on principals was the ability to ‹follow-up› with teachers and students. One female principal from a school in Fujairah noted that the programme 'offered modern techniques and tactics and in addition provided teachers with ways to plan lessons and also record student presence and absenteeism'. A further 11% of principals reported that the most significant positive impact of the MBRSLP on principals was the increased efficiency in their work. Nine percent of principals noted that the programme had led to increased skills and knowledge for both themselves and the students. One principal from Ras al-Khaimah stated that he now has 'meticulous attention to detail' and another principal from Ajman noted his belief that, as a result of the MBRSLP, 'students' critical thinking skills and analytical skills are improving'. These are noteworthy because of the way they demonstrate a substantive change in how the school environment is operating because of the attitude and practice of principals.

Principals identified the most positive impact of the MBRSLP on teachers as being their increased ability to use technology effectively (33%). One female principal commented that the programme allowed teachers to 'work as a team employing technology in education'. Principals also noted increased collaboration and communication between teachers and with students (24%). A female principal from Sharjah commented that the programme allows teachers to 'exchange materials and information with each other in a fast and effective manner,' and another principal from Fujairah noted similarly that it allows teachers to 'exchange experiences and integrate [different practices] with colleagues'. A further 15% commented that the programme has improved teaching methods as teachers were now focusing on individual differences in student aptitude and learning and planning lessons for them accordingly. This is a significant finding because it demonstrates that

a portion of participating teachers have made a positive alteration to their pedagogical approach as a result of the inputs of the MBRSLP. This was confirmed through face to face interviews, where principals reported that, because of the programme, teachers have increased ability to create lesson plans and worksheets, and tailor their teaching to students' individual needs. One female vice principal in Fujairah noted that now, 'If [teachers] want to improve talent, they can set specific tasks for each student; if they want to help the students at lower levels, they can. They can make specific plans for each child. When there is plenty of planning and strategy, it makes it easier for them to plan for the lessons.'

Principals perceived the enhanced learning process, increased communication and collaboration, student engagement and the development and application of new skills as the things that have had the most significant positive impact on students as a result of the MBRSLP. Survey respondents often expressed a combination of these themes in the answer to this question. For example, a principal of a girls' school in Fujairah noted the most significant impact as being both the 'ease of communication with teachers and also self-directed learning'. More than a third of principals (35%) perceived an enhanced learning process as the most significant positive impact on students. Answers included concepts such as 'self-directed learning' as well as students participating more in research and analysis. Once again, this is a significant finding because it indicates a change in pedagogical approach in the classroom. This was illustrated by one female principal from Fujairah who explained in interview: 'Smart learning helps students to use it in their life and teaches them to be self-confident. They learn to depend on themselves. It helps them to be creative in their future, and the target is to concentrate on developing skills, not just memorising information.' The second most significant theme (24%) was increased interaction and communication with teachers and students. A further 20% of principals highlighted increased student engagement as the most significant result of the MBRSLP, using terms such as 'fun', 'love', 'passion' and 'enthusiasm' to describe how their students felt about the programme. A male principal from Sharjah expressed that students 'enjoy lessons and passionately and enthusiastically wait for future lessons'.

5.5.   Principals: challenges encountered in the programme

The principals were also asked to give their perspective regarding negative consequences of the MBRSLP, in relation to principals, teachers and students. It is noteworthy that, each time, the largest category of responses was that there had been 'no negative impact'. The most frequently cited problems were all focused on the challenges regarding the technology rather than the strategic approach of the programme. Eighteen percent emphasised the weakness of the internet and network crashes as a particular challenge. A female principal from Fujairah reported the 'stress caused by network failures' as the most significant negative aspect. A further 10% described technical problems with the devices, especially the delays in receiving technical support and the poor maintenance of devices. A female principal from Umm al-Quwain explained that 'we suffer due to the absence of someone responsible to fix such issues rapidly.' Comments included issues with device crashing as well as the slow repair of devices due to the lack of a dedicated support team and decreased support in the schools. Seven percent of principals specifically identified increased burden on teachers due to the network crashes and weak internet as

a significant negative impact. The lack of in-school technical support is clearly a current challenge for the programme, as noted in chapter 4. It is also a finding in keeping with other research regarding the importance in-school support for the effective integration of ICT (UNESCO 2011, Ng 2009, Cheung and Slavin 2011, Unwin 2009).

When asked to give their perspective on the negative impact on the MBRSLP on students it was noteworthy that the majority of principals responded by talking about the way in which the technology was being utilised in the classrooms rather than the strategic approach of the programme itself. They identified things like the way the introduction of technology has led to challenging student behaviour and disruption of students' concentration and a lack of attention to studies. Principals also bemoaned the way in which some devices were being neglected or misused. Each of these issues is also reflected in the wider literature as possible consequences of introducing technology into a school context, depending on the capacity and appetite of teachers to utilise it effectively (Tondeur et al 2007, Hennessy et al 2005). The perception that students were misusing the devices and using them for games and entertainment rather than for school work was widely mentioned by principals in the school visits. For example, a female principal from Dubai claimed that students use the devices to 'browse sites that are banned,' and a male principal from Ras Al-Khaimah described how 'students sometimes use the devices for entertainment rather than educational purposes'. This is worthy of further attention, as the detail of how the devices are used in schools should be primarily the responsibility of the individual school. This issue was also expressed by principals during interviews, with some reporting that students' access to games was having a negative impact on learning, and that students were misusing the tablets. However, usage that is considered to be inappropriate from students should not be viewed as a negative impact of the programme in and of itself, but rather an issue of school level application and approach to usage. There were a range of suggestions from Principals regarding how the devices could be better protected, such as through restricting the devices to school-based usage. This is to be expected, and demonstrates the need for on-going communication from the MBRSLP to school principals regarding the overall strategic approach of the programme and the pedagogical rationale for allowing home-based usage for students.

A small group (11%) of survey respondents expressed their belief that the programme was being implemented in a way that had led to an overreliance on technology, which is in turn having a negative effect on traditional learning, such as handwriting, spelling and free reading. A male principal from Dubai stated that the programme had affected students' ability and enthusiasm for 'reading and writing of books'. This is a well-recognised perspective and is often reported anecdotally when technology is introduced into classrooms. However there is no empirical evidence that the fears translate into actual negative impact on learning.

Principals were also encouraged to reflect on what improvements they would like to see in the programme over the coming year. This prompted the principals to provide a broad selection of recommendations, most of which focused on previously mentioned issues that are recognised by the programme as challenges encountered in the 2015-16 implementation (as discussed in chapter 4). Once again, principals chose to emphasise the need for strengthened internet as well as continued technical support and a faster process for the repair of broken devices to prevent disruption to teaching and learning.

The importance of in-school support was illustrated by a female principal from Ras al-Khaimah who noted in the online survey that the programme would be enhanced by 'the presence of a full integration team in the school, who can work with the Principal to reinforce the practical training process'. She went on to emphasise that this is 'important and necessary for the programme to reach its potential … the presence of the coordinator of the programme in the school on a daily basis is also important to support students and teachers'. Relating to this, in relation to the importance of enhancing teacher capacity to engage with the programme, a female principal from Ajman noted the importance of improving the 'quality of training provided to the teachers at the beginning of the school year and the appointment of an IT specialist to every school who can train students and teachers and can also promptly deal with network problems any day of the school year.' Multiple principals explained how they felt that the quality of in-school support had deteriorated in the last year and that this had had been a negative aspect of their experience in 2015-16.

6. Changes in perceptions, attitudes and practices of teachers

6.1. Introduction

This chapter examines the way in which the MBRSLP is influencing the perceptions, attitudes and competences of teachers. It draws on the face to face interviews in the schools and the responses to both the qualitative and quantitative aspects of the online survey from the teachers. The chapter begins by considering the teacher perspective on how the MBRSLP is having an impact on learning outcomes and quality of teaching. It then focuses on the teacher perspective of programme impact on themselves and students, followed by the implications for teacher workload, enjoyment and use. It then considers the effectiveness of training, support, hardware and software. The chapter closes by focusing on the challenges that have been encountered in the programme this year, again from the perspective of the teachers.

6.2. Teachers: impact on learning outcomes and quality of teaching

The majority of teachers (70%) believe that the MBRSLP is already having a positive impact on student learning outcomes, this is an increase from 64% in 2015. Another 20% were not sure, while 10% responded that it has not had an effect on improving learning outcomes. It is noteworthy that their positive perspective regarding programme impact has grown despite the challenges faced through the year. Some 79% of teachers thought there would be a positive impact on learning outcomes from the programme from the MBRSLP one year from now, this is an increase from 70% in 2015. Male teachers tended to be more positive about the impact on student learning outcomes than female teachers, with 77% agreeing the programme was having a positive impact, compared to 59% of female teachers.

Do you think the MBRSLP is having a positive impact on student learning outcomes?
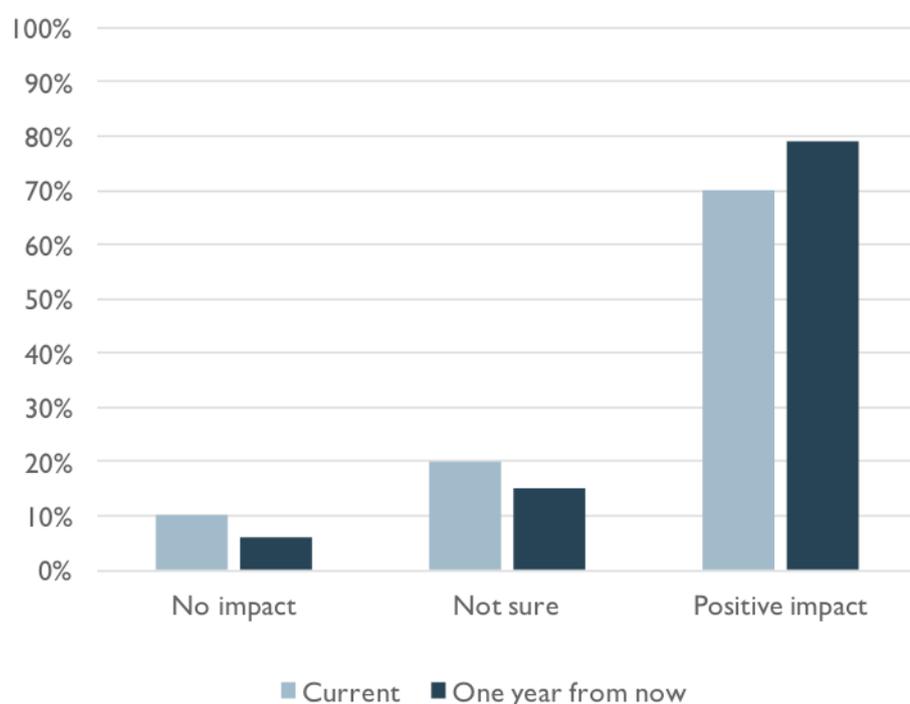
Figure 17. Current and projected impact on student learning outcomes.

The majority of teachers reported that the programme has led to an increase in the quality of teaching (84%) and quality of student learning (73%). These findings are significant as they reflect the view of those most closely involved in the daily work of teaching and learning. It is also noteworthy that these figures have stayed consistent with previous years despite the challenges encountered. Indeed, there was a slight increase from 2015 when 80% reported an increase in the quality of teaching and 71% reported an increase in the quality of student learning. Similarly, 70% of teachers reported that student behaviour had improved as a result of the programme, compared to 60% in 2015 and 53% in 2014. As previously noted, male teachers were consistently more positive than female teachers in their responses regarding the impact of the MBRSLP.

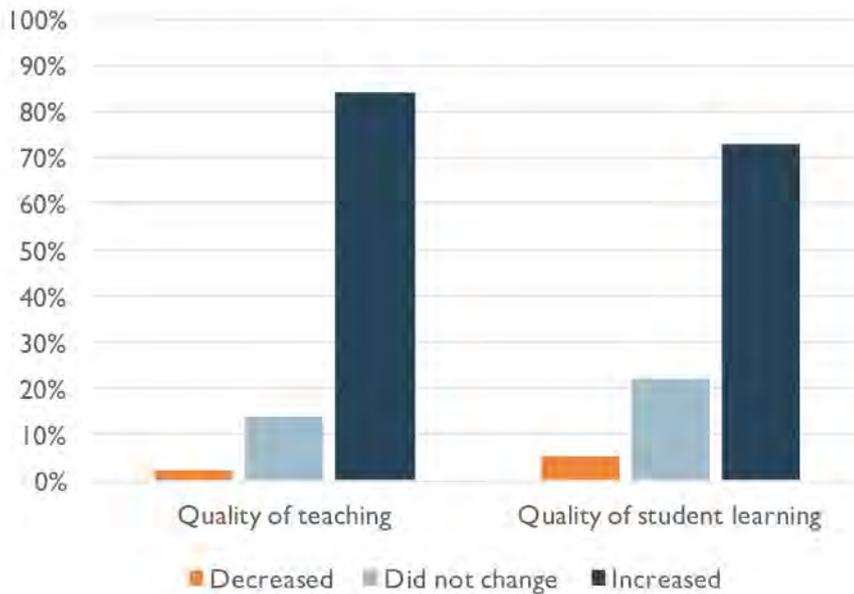## How has the implementation of the MBRSLP affected the following areas?

Figure 18. Impact on quality of teaching and student learning quality.

Over the last three years there has been a gradual increase in the numbers of teachers who report that the level of collaborative learning has increased as a result of the programme. In 2014 this was 59%, in 2015 it was 63%, and in 2015 it was 71%. These findings show an encouraging trajectory of sustained change in classroom approach and underscore the specific ways in which the quality of teaching and learning appear to have changed towards more collaborative pedagogical models as a result of the MBRSLP.

How has the implementation of the MBRSLP affected the following areas?
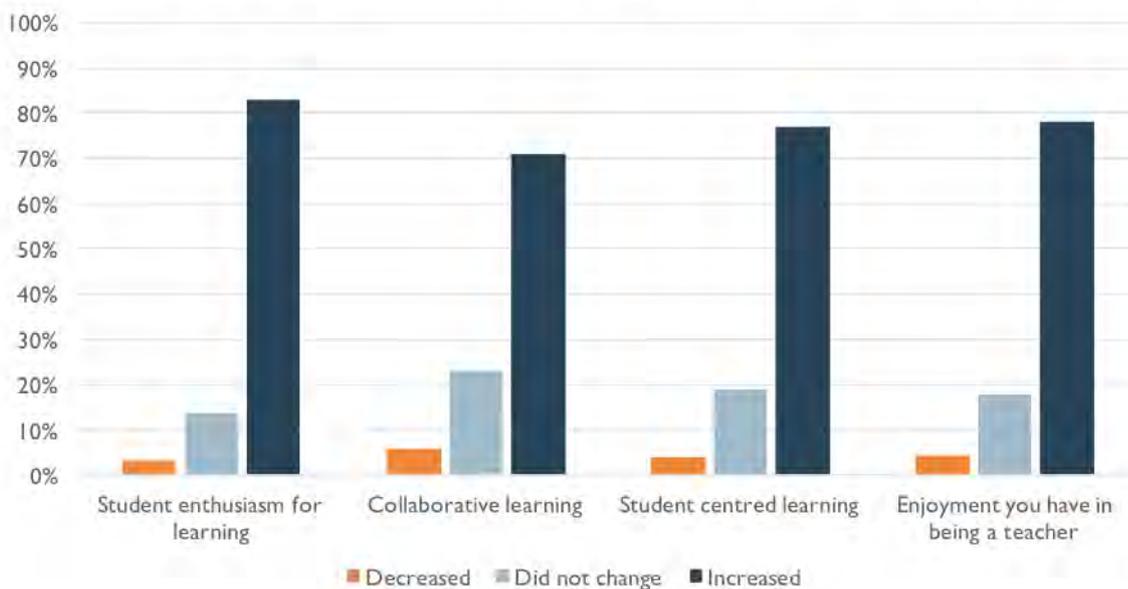
Figure 19. Impact on different aspects of learning and teaching.

It is likely that the increase in collaborative learning is linked to the increased confidence that teachers report in using ICT compared to previous years. The teacher survey asked teachers to assess their own confidence in ICT before and after the MBRSLP, in relation to five areas of activity. The graph below demonstrates the change in confidence that has taken place. Overall teacher confidence in using ICT for collaboration between teachers increased from 3.96 before the MBRSLP to 4.22 after participating in the MBRSLP (using a 1-5 ranking). However, it should be noted that there is a complex relationship between self-reported confidence and competence levels. Throughout any ICT implementation, the two are likely to have an ongoing cyclical effect on each other. Indeed, retrospective self-assessment of confidence is often skewed because, as has been demonstrated in other research, an increase in familiarity can lead to an awareness regarding limitations in competence (Hollow et al 2014).

Figure 20. Teachers' confidence in using ICT for different elements of their work.

6.3.   Teachers: impact on self and students

Teachers' survey responses highlighted the ways that the MBRSLP has a positive impact on what happens in the classroom and the learning that takes place. Thirty-three percent of teachers reported that the most significant impact of the MBRSLP on themselves was the greater efficiency and simplification of their approach to teaching. Examples included effective classroom management, streamlined means of sending and correcting student

homework, enhanced preparation and organisation of student tasks. A further 22% of teachers reported that the most positive impact of the MBRSLP on teachers had been the impact on communication and collaboration. During a focus group with male teachers in Umm al-Quwain, one teacher commented that the programme has 'added a lot to my teaching; there is a lot of progress in results and the learning is becoming smoother. Also the students› interaction and communication is much better. In general it is the learning of the future - sooner or later we need to adapt and master it.'

The survey also asked teachers to give an example of how their approach to teaching has changed as a result of the MBRSLP. In response to this, many teachers (27%) emphasised the improved communication and collaboration with students as well as with other teachers that had taken place because of the programme. An Islamic studies teacher from Ras al-Khaimah noted that he was 'communicating with students all the time and keeping all channels of communication open.' A further 24% of teachers reported enhanced lesson planning and another 22% noted using diverse methods in their teaching, such as encouraging student debates and presentations, as well as using different strategies and games to engage students. A further 16% of teachers highlighted the increased use of technology as a change to their teaching. Crosscutting themes related to technology facilitating better communication and collaboration as well as providing the means to include diverse methods. For example, an English teacher from Fujairah who has been participating in the programme for a year explained that the programme had made it easier to 'work collaboratively due to the use of technology.'

The online survey also focused in some depth on teacher perspectives of how the MBRSLP is influencing students. The common emerging themes regarding the positive impact on students included changes to communication and interaction, increased initiative, a more effective learning process, increased enjoyment of learning and motivation, and finally, increased ability. Almost half (48%) of respondents said that changes to communication and interaction was the most significant positive benefit of the MBRSLP on students. These survey respondents reported that it was easy to share information in classes and there was an increased level of interaction amongst students as well as with teachers. The teachers also noted that the content provided by the programme was more interactive and hence more enjoyable and engaging for the students. A further 19% mentioned increased initiative and participation referring to lessons, homework and activities. Another 16% of survey respondents reported increased student engagement, explaining that there was more enjoyment and motivation towards attending and participating in class. During one focus group with male teachers in Dubai, teachers reported that the most significant positive impact on students was that 'there is greater excitement and better participation, and they are more encouraged to continue with the smart learning'. These findings are significant because, once again, they indicate the way the programme is influencing what happens in the classroom and the way students are learning.

Thirty-one percent of teachers indicated that digital content was having an impact on the group dynamics and interactions of their classes. Examples of these interactions included collaborative work in the classroom and engagement with the interactive content provided by the programme. An Arabic teacher from Sharjah who has been participating in the programme for one year reported that the 'interactive content makes students collaborative,' A further 27% of teachers commented that students were able to use a

diverse range of methods and techniques, mentioning different activities such as debates, presentations, exercises and homework as well as concepts such as 'self-directed learning'. One male teacher in Ras al-Khaimah commented in a focus group discussion that students have 'different types of intelligence - some learn visually, they see anything in colours, maps, pictures, and they can memorise it. Other students learn when they listen. [The programme] helps students with different types of intelligence. I think the marks also reflect this impact.'

On a similar but distinct theme, teachers were asked about their perceptions on the impact of ICT on the way in which students learn. Twenty-one percent of teachers noted that ICT had an impact on communication, interaction and collaboration between students and with their teachers. Teachers noted that positive communication and collaboration was taking place inside the classroom as well as outside the classroom due to the use of the different programmes. A further 19% of teachers reported that ICT had an impact on increased student engagement, using terms such as 'motivation', 'love', 'passion' and 'excitement'. A computer science teacher from a girls' school in Ajman noted that 'learning is more fun with ICT'. Similarly, a civics education teacher from a boys' school in Ras al-Khaimah commented that the introduction of ICT 'has increased the desire of students to study'. Some 17% teachers reported that it had made learning easier, and another 15% mentioned a diversification of learning practices, using specific tasks such as homework, activities and research to further explain their response. A mathematics teacher from Sharjah who has been participating in the programme for two years reported that the programme has helped students 'learn in different ways' and another teacher who has also been participating for two years said that ICT 'makes education more diverse'. In teacher focus group discussions, a male participant in Dubai reported that the programme has produced 'greater excitement and better participation' among students, and a male teacher in Umm Al-Quwain said 'as a Maths teacher, it is so exciting that there are students who begin to love this subject. I love Maths, but so many students hate it, but now they have begun to love it ... their perspective has totally changed'. It is significant that teachers are now identifying substantive change in their pedagogical approach as a result of the programme.

6.4. Teachers: implications on workload, enjoyment and use

Teachers were asked to describe the way in which the MBRSLP has influenced their workload over the 2015-16 academic year. A total of 73% responded that their workload had increased as a result of the programme. Although a large majority, this is an ongoing decrease from 84% in 2015 and from 92% in 2014. The figures are not inherently concerning and there are multiple possible reasons for the three year trajectory. As noted previously, an increase in workload is a common consequence of introducing technology into an education system because of the additional time required to prepare lessons in a new way (Beetham and Sharp 2013, Uluyol and Sahin 2014). The in-school interviews with teachers largely correlated with the views from the online survey. Teachers often noted that the MBRSLP classes required more preparatory work than their other classes. They explained that this affected their balance of work and sometimes meant they did not have as much time left to devote to classes in other years or other subjects which did not use MBRSLP technologies and resources. However, there were still a variety of perspectives

expressed, with a civics education teacher from a boys' school in Fujairah expressed his belief that the programme has actually led to 'increased activities for students which has hence reduced the burden on teachers, especially correcting and marking homework and exams.'

It is not possible reliably to hypothesise regarding the future trajectory of impact on teacher workload and it will be necessary to continue monitoring in future years to understand it more fully. It is noteworthy that of the teachers who said that workload had increased because of the MBRSLP, 83% also said that the quality of teaching had increased, and 77% said their enjoyment as a teacher had increased because of the programme.
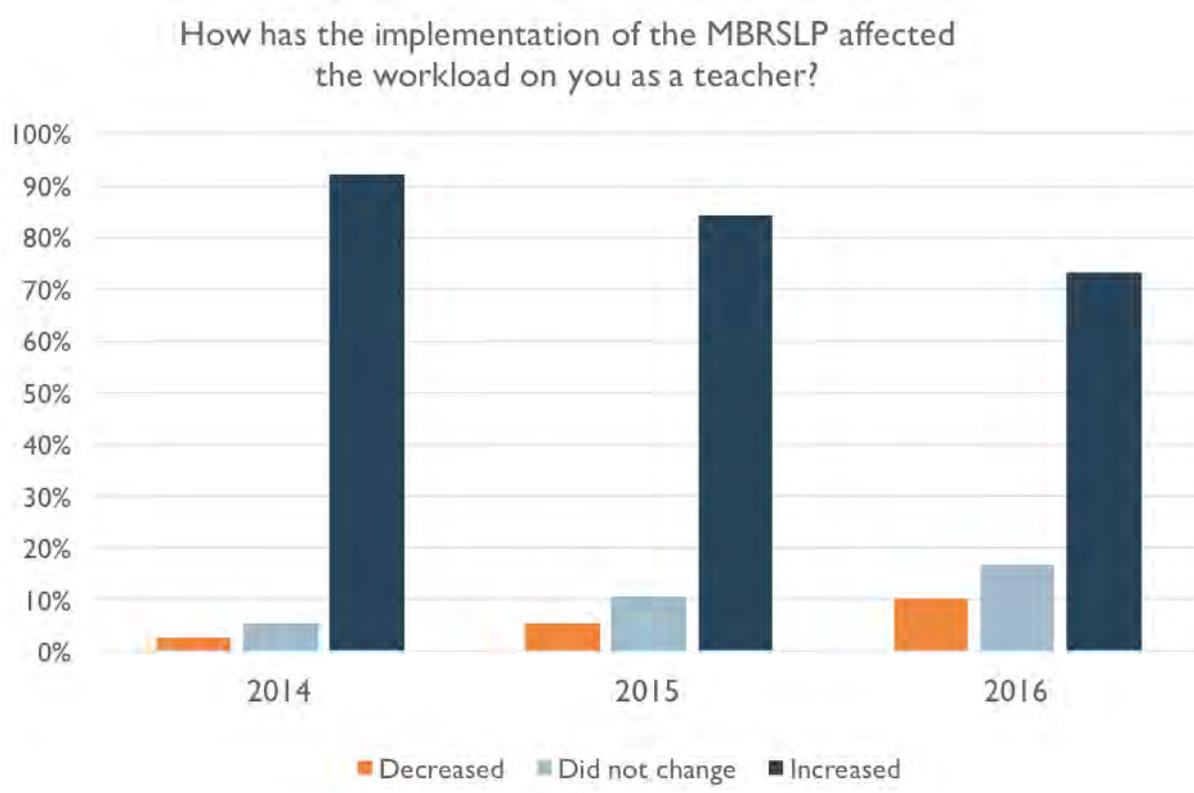
Figure 21. Teachers reported impact on their workload in 2014, 2015 and 2016.

The graph below illustrates the fact that, despite the reported increased workload resulting from the programme, 54% of teachers 'strongly agreed' and only 3% disagree that they enjoy using ICT in their work. A large majority (92%) of teachers 'strongly agreed' or 'agreed' that they found it easy to use ICT in their work and a large majority (87%) 'strongly disagreed' or 'disagreed' that ICT made them feel nervous, compared to 10% that 'strongly agreed' or 'agreed'. The lack of nervousness regarding ICT usage is a positive finding, but the fact that teachers report that they find it easy to use ICT in the classroom does not necessarily indicate that their usage is at a mature level.

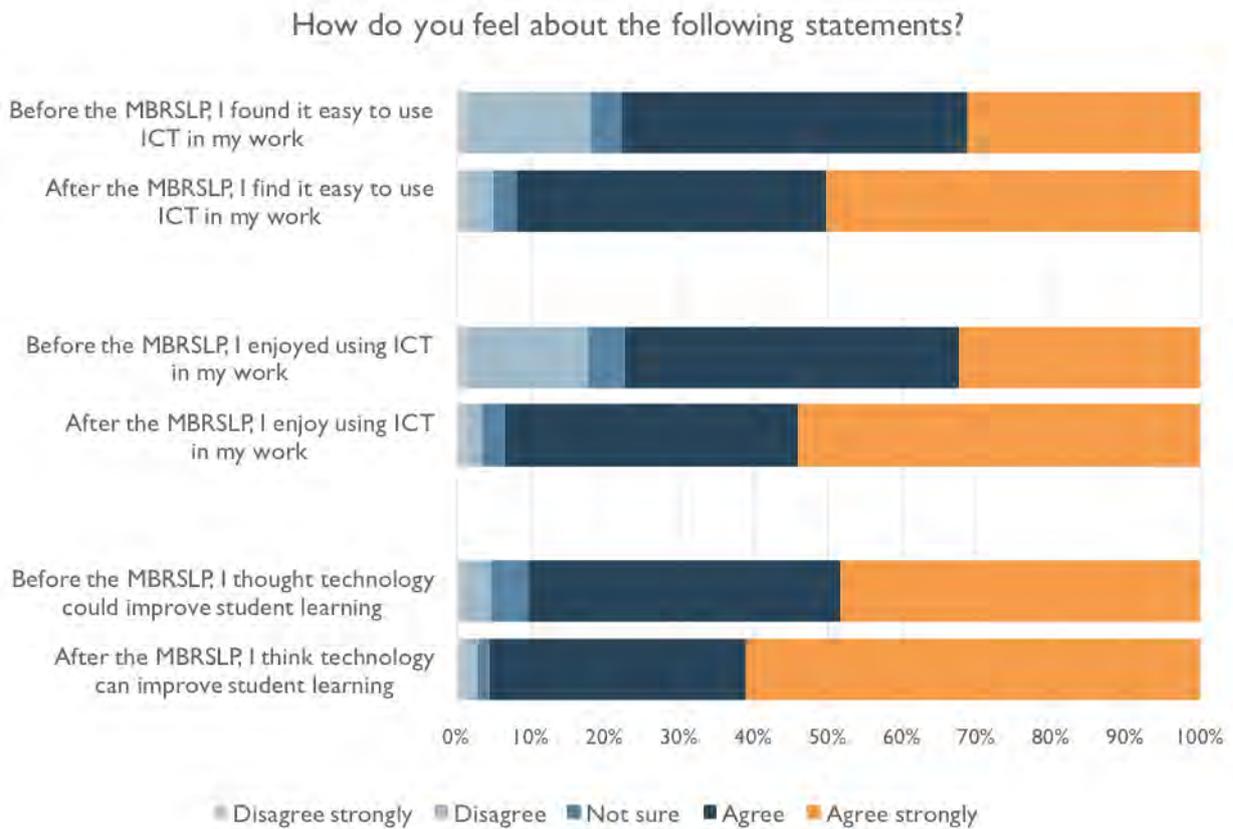## How do you feel about the following statements?

Before the MBRSLP, I found it easy to use ICT in my work

After the MBRSLP, I find it easy to use ICT in my work

Before the MBRSLP, I enjoyed using ICT in my work

After the MBRSLP, I enjoy using ICT in my work

Before the MBRSLP, I thought technology could improve student learning

After the MBRSLP, I think technology can improve student learning

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Disagree strongly   Disagree   Not sure   Agree   Agree strongly

Figure 22. Teachers' perceptions of ICT before and after the MBRSLP.

The teachers were asked about the ease of use of the various aspects of the MBRSLP system. The survey results demonstrated that the teachers find the smart board the easiest component to use: 63% indicating 'very good' for teachers and 51% 'very good' for students. In contrast, connecting student devices to the system (the connection between the tablets and the network) was the most difficult, with 28% reporting 'average' ease of use and 21% reporting 'poor' or 'very poor' ease of use. The in-school interviews suggest that the detail of the challenge with connecting student devices to the system was related only to connectivity rather than being device-specific.

Similarly, the teachers were asked to select the three tools within the MBRSLP that they considered to be most important for their work. Those with the most frequent responses were SmartAuthor (64%), Ketab Studio (61%) and Net Support (41%).
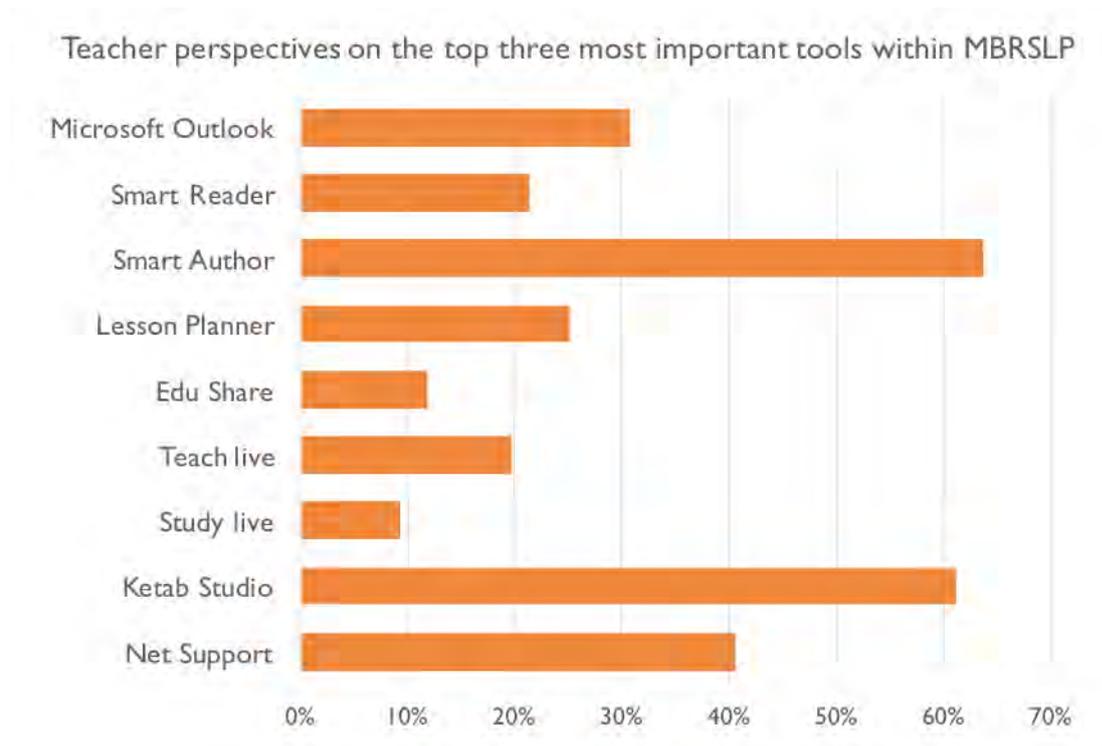
Figure 23. Teachers' perspectives on most important tools within the MBRSLP.

The tools that teachers considered to be least important were Study Live (9%) and Edu Share (12%). The in-school interviews indicated that this is because some tools are perceived as central to the programme (such as SmartAuthor) and have become a regular feature within lessons, whereas others (such as Study Live) are still viewed as peripheral for the majority of teachers.

6.5.   Teachers: the effectiveness of training, support, hardware and software

Teachers were asked to rate the effectiveness of different aspects of the training and technical support provided by the programme in 2015-16. The majority of teachers were positive, with 64% responding that the length of the training was 'good' or 'very good', with an average rating of 3.70, and 75% responding that the quality of the training was 'good' or 'very good', with an average rating of 4.03 (on a scale of 1-5, ranging from 'very poor' to 'very good'). This demonstrates a slight increase in reported training quality compared to findings in 2014-15 (3.88) but a slight decrease compared to findings in 2013-14 (4.14). The decreased in perceived effectiveness of the teacher training when compared to 2013-14 is unsurprising considering the reduced resources available for teacher training within the 2015-16 implementation. Indeed, the delay in the provision of the teacher training mean that some new teachers were introduced to the MBRSLP without a full awareness of how the programme operates. For those teachers that did receive training, the focus was on making effective use of the technology within the school environment. In light of this, the assessment of the quality of training is higher than may have been anticipated.

Some 54% of teachers responded that the effectiveness of the ITS (previously termed the 'adoption team') in ensuring the ICT equipment works well was 'good' or 'very good',

compared to 22% who responded that is was 'poor' or 'very poor'. The promptness of the technical support in responding to problems was reported to be 'good' or 'very good' by 59% of teachers, compared to 18% of teachers that reported this to be 'poor' or 'very poor'. It is worth considering the implications of these findings for the future health of the programme, as other research has emphasised the central importance of ongoing, in-school training and support in order to sustain and develop teacher participation in new technology-related programmes (Unwin 2009, Hollow et al 2014, UNESCO 2011).
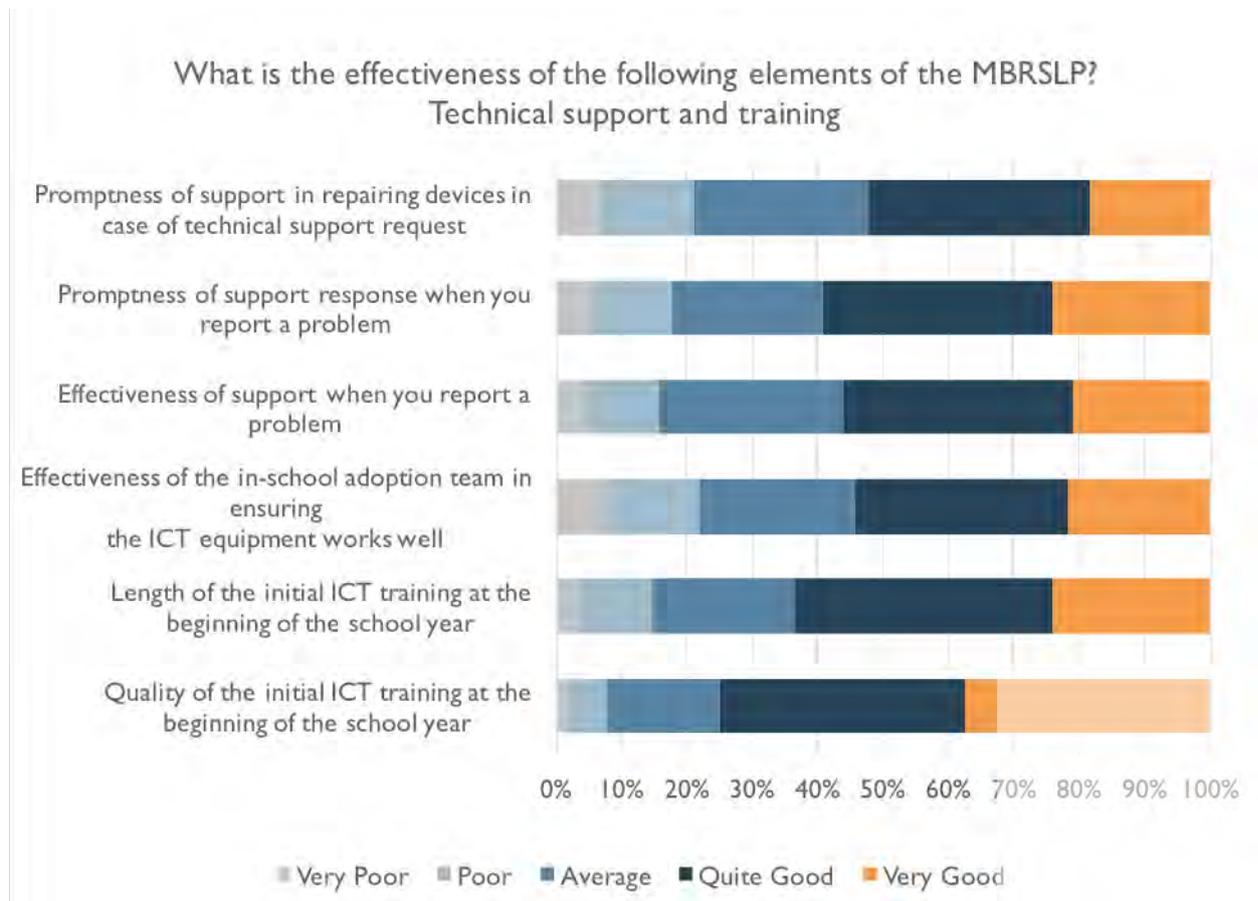

Figure 24. Teachers' perceptions of the technical support and training provided by the MBRSLP.

Although results remain relatively positive in regard to the technical support, there is a slight decline in the effectiveness and promptness of support across four variables in comparison to previous years. There was a clear decrease in the average reported effectiveness of the in-school adoption team: 4.35 in 2013-14, 4.21 in 2014-15, and 3.46 in 2015-16. Similarly, the teachers noted that the promptness of responding to a reported problem had reduced. Again, this is clear link to the reduced size and capacity of the ITS to provide in-school support to the desired level.
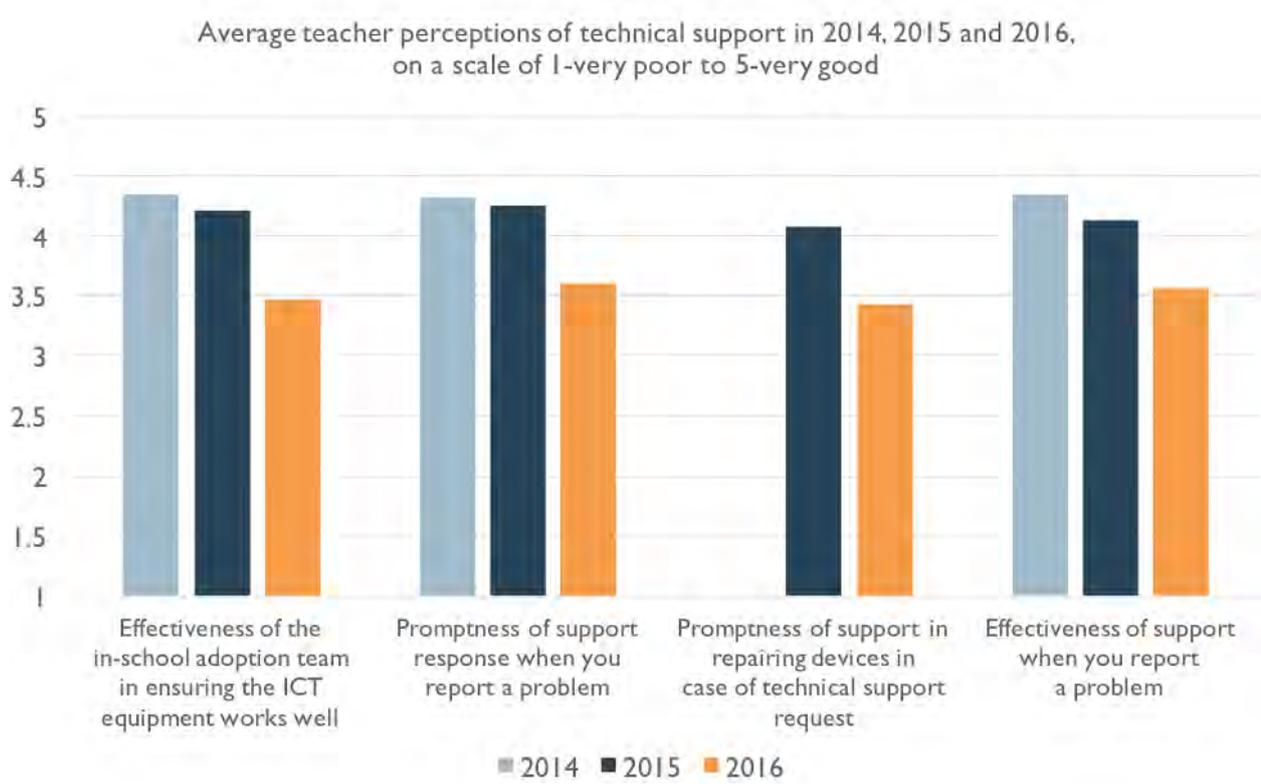
Average teacher perceptions of technical support in 2014, 2015 and 2016, on a scale of 1-very poor to 5-very good

Figure 25. 2014-2016 comparison of teachers' perceptions of technical support.

It is noteworthy that within the 2015-16 results there was greater positivity regarding both the training and technical support among teachers from more recently participating schools (schools reported to be participating for one year or less), compared to teachers from schools with more long-term participation (schools reported to be participating for two or more years). It is not possible to give a reliable rationale for this: it may indicate that those teachers who have participated in the programme for less time still retain initial enthusiasm, or may indicate that those who have participated in the programme for more time had have higher expectations regarding the level of training and technical support they should receive, or did receive previously in the programme. For example, 79% of recent participants reported that the quality of the initial training was 'good' or 'very good' (with an average rating of 4.13) compared to 71% of teachers participating for two or more years (with an average rating of 3.89). A total of 64% of recent participants felt the promptness of support in repairing devices was 'good' or 'very good' (with an average rating of 3.75), compared to 39% of longer term participants (with an average rating of 3.08).

The findings also demonstrate that female teachers are more likely to have a positive perspective regarding the technical support compared to male teachers. For example, 70% of female teachers reported that the promptness of support when reporting a problem was 'good' or 'very good', compared to 52% of male teachers, and 65% of female teachers reported that the effectiveness of technical support when reporting a problem was 'very good' compared to 50% of male teachers. These figures are reflective of the experience of the research school visits, which found a higher average level of engagement in the MBRSLP from girls' schools compared to boys' schools.

Teachers were positive about the hardware and software available to them and their students. They were asked to rate the reliability and quality of hardware and software provided by the programme on the scale of 1-5, ranging from very poor to very good. The full results are displayed in the graph below.
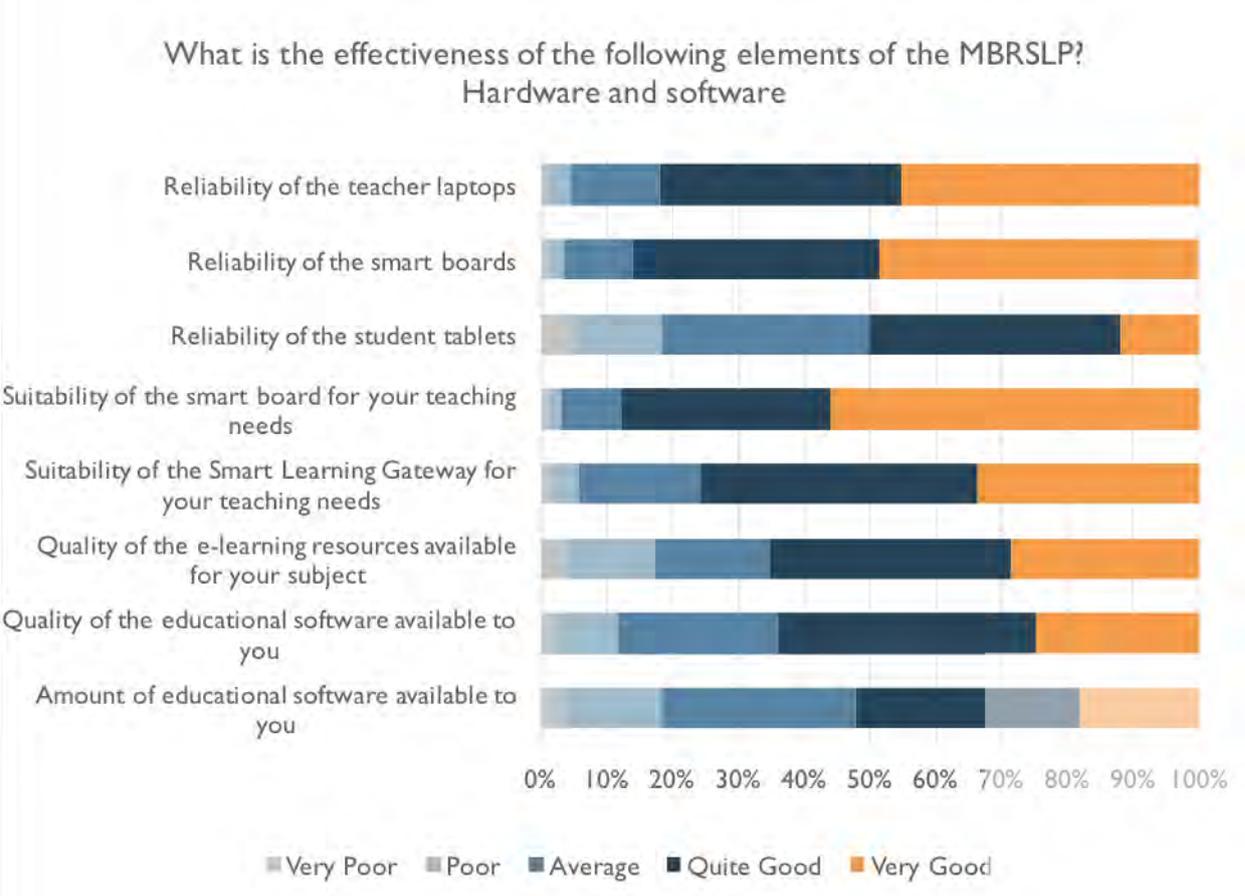

Figure 26. Teachers' perceptions of the hardware and software tools provided by the MBRSLP.

Teachers were particularly positive about the smart boards and teacher laptops: 86% reported that the reliability of the smart boards was 'good' or 'very good', compared to 3% reporting the reliability to be 'poor' or 'very poor'. In relation to laptops 82% reported that the reliability was 'good' or 'very good', compared to 5% reporting the reliability to be 'poor' or 'very poor'. Teachers were slightly less positive in regard to student tablets, with 50% of teachers reporting that the reliability of student tablets was 'good' or 'very good', compared to 18% reporting the reliability to be 'poor' or 'very poor'. Teachers were also relatively positive in regard to the software provided to them through the programme. A total of 52% reported that the amount of educational software available was 'good' or 'very good', and 64% reported that the quality of the educational software was 'good' or 'very good'. Most of these figures have dropped slightly but not dramatically in comparison with previous years. This is likely to be because the deployment of hardware and software has remained relatively consistent through each year of the programme, the programme challenges are more focused on the support around the technology and the connectivity to utilise it effectively.

6.6.   Teachers: challenges encountered in the programme

Teachers were asked to explain what they considered to be the most significant negative consequence of the MBRSLP on teachers. As with the principals' responses, it is noteworthy that the largest proportion of responses said that there was no negative consequence of the programme. Of those that did note negative consequences, the main themes identified were increased workload and time restraints, weak internet and network crashes, time spent on preparation and the lack of confidence with technology as main concerns.

A mathematics teacher from Fujairah, who has been participating in the programme for two years, noted, 'there are no negative effects, but I need more time and effort to acquire the skills in ICT.' Twenty-four percent of teachers responded that the most significant negative impact of the MBRSLP on teachers was the impact on time, especially the additional time required to plan and prepare lessons, wasted time due to hardware failures and poor timing of the training. Nineteen percent reported that weak internet, network crashes and hardware malfunctions led to significant challenges. During the focus group discussions with teachers, some felt similarly that the programme had increased the time taken to prepare lessons and is an added 'burden'. Other teachers also mentioned difficulties with distracted students, problems with the internet and their lack of access to download programmes. For example, one male teacher from Umm al-Quwain reported that 'we don›t have full access - this year it was centralised, and even the technical agents don›t have access, so it becomes very complicated and we feel unable to do anything'.

Another 20% mentioned device crashes and misuse of tablets as the most significant negative impact. Students' use of the devices for games and entertainment purposes and the resulting distraction from school work were common complaints. A further 12% reported that the overreliance on technology was leading to the neglect of traditional learning skills, which they described as free reading, handwriting and spelling. A small group (7%) noted that there was a lack of commitment and engagement from the students. It is important to note that this was in stark contradiction to responses to other questions which showed a high level of student engagement and enthusiasm towards digital learning as a given example of the positive impact of the MBRSLP. Students' poor handwriting and spelling as a result of the MBRSLP was a recurring theme reported in the teacher focus groups. Similarly to with principals, a number of teachers were concerned about the negative impact of students using the tablets for purposes other than education, such as playing games and using YouTube, while several teachers also raised concerns that students were careless with the devices and not using them responsibly.

Teachers provided various recommendations for future improvements to the programme. Their suggestions included improving the network and internet connection (18%), increasing the number of programmes offered (17%), diversifying curriculum and lesson plans (14%), strengthening communication and collaboration (13%), as well as increasing the training (13%) and support (8%) provided. An English teacher from Ras al-Khaimah who has participated in the programme for two years commented that he would like 'more training for teachers, as well as the presence of technical support team in the school who can repair the devices for students and teachers promptly and provide replacements quickly.' A female science teacher from Umm al-Quwain who has participated for less than

a year requested 'faster and stronger internet and in-depth training on the implementation of Ketab and NetSupport.' Similarly, a male mathematics teacher from Sharjah who has participated for less than a year recommended 'more training and more programmes.' These recurring messages correlate with the recognised challenges encountered by the programme in the 2015-16 implementation.

7. Smart services

The majority of teachers considered that the MBRSLP has helped the education sector catch up, and indeed exceed, other sectors in terms of the use of smart services. Ninety percent of teachers said that they think the MBRSLP is helping the education sector to catch up with other government sectors in the use of smart services. Asked where they felt the education sector was in relation to other sectors in the use of smart services before the MBRSLP, 17% of teachers said that education was a long way behind, 37% that it was a little way behind and 29% that it was on the same level. Asked where they felt the education sector was now, after the MBRSLP, 10% of teachers felt education currently remains a little way behind other sectors, while 37% said it is on the same level, and 51% said it is a little way or a long way ahead.
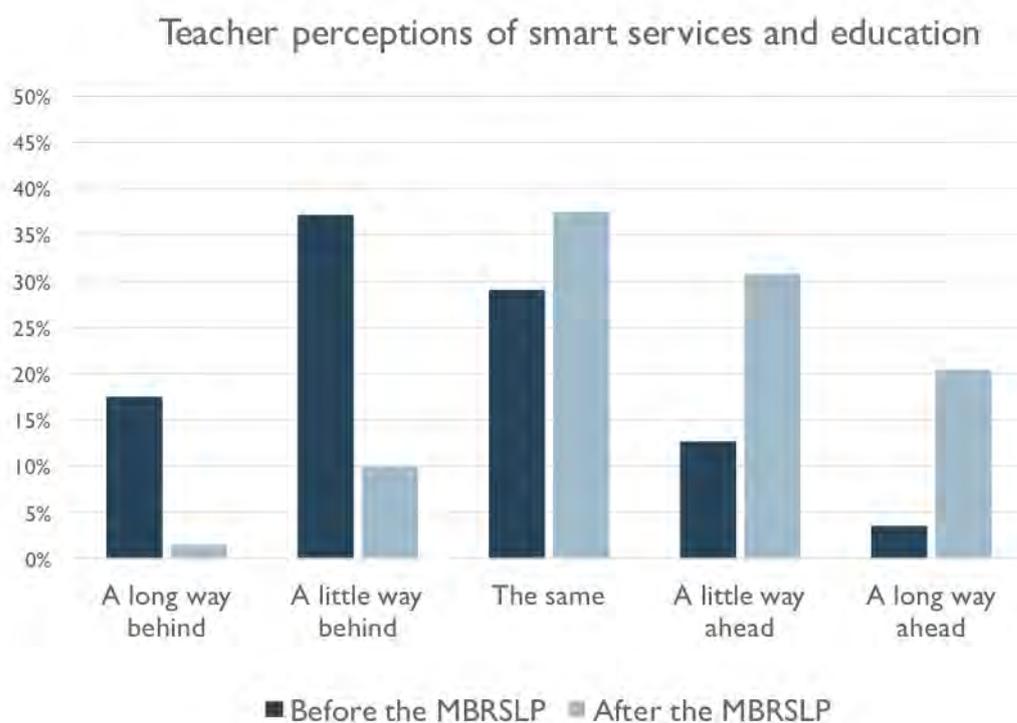

Figure 27. Teacher perceptions of smart services and the education sector in relation to the MBRSLP.

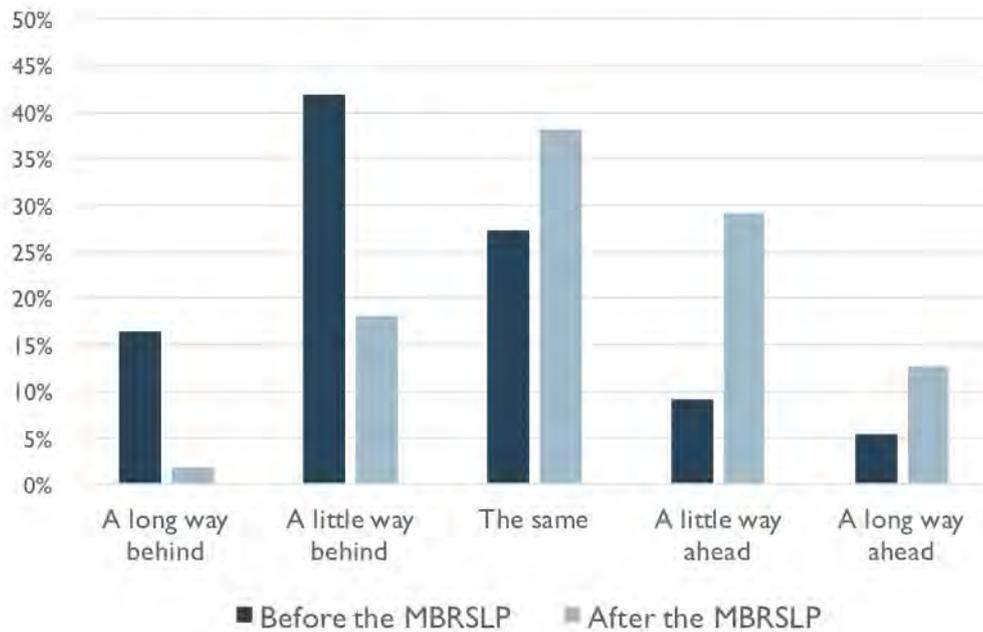Principal perceptions of smart services and education

Figure 28. Principal perceptions of smart services and the education sector in relation to MBRSLP.

Similarly, 85% of principals reported that they think the MBRSLP is helping the education sector to catch up with other government sectors in the use of smart services. Sixteen percent of principals felt that education was a long way behind other sectors in the use of smart services before the MBRSLP, 42% that it was a little way behind and 27% that it was on the same level. Asked where they felt the education sector was now, after the MBRSLP, 18% of principals felt education currently remains a little way behind other sectors, while 38% said it is on the same level, and 42% said it is a little way or a long way ahead. These figures demonstrate a widely held and significant belief from both teachers and principals that the MBRSLP is playing an important role in helping education to make progress as a sector, and in comparison with other sectors in the United Arab Emirates.

8. Key findings and recommendations

8.1. Summary of findings

There has been an unprecedented level of change within the Ministry of Education in the United Arab Emirates within 2015-16. This has led to multiple new, and hopefully temporary, challenges for the MBRSLP. However, there are encouraging signs that in the long term the integration of the MBRSLP with the Ministry of Education will lead to significant benefits for the programme and all participating schools, and ultimately, to enhanced student learning across the United Arab Emirates. The integration with the Ministry of Education ensures that the MBRSLP agenda for educational transformation has been brought into the mainstream: collaborative, child-centred pedagogy and adaptive learning are now at the centre of how the Ministry of Education aspires to operate. In addition, the programme can now focus on its core strengths of facilitating strategic change and building capacity for effective use of technology in schools.

The rapid growth of the MBRSLP and its integration into the teaching and administration of schools within the past three years has demonstrated a high level of commitment to educational change, and the inevitable consequences that accompany such change. The resources applied to the programme underscore the need for an on-going commitment to a comprehensive and unified approach across stakeholders, in order to maximise the impact that can be achieved. Every such programme at a national level will encounter challenges as innovation in the classroom has increasing implications and demands on administration and the delivery of infrastructure. The limitations encountered recently in the MBRSLP are a reflection of these growing pains and, within the context of similar educational change programmes, point to the need for cooperation and pursuit of a common vision for change. Despite the challenges and limitations there are encouraging indications of continued progress. In this final chapter of the research these positive aspects are grouped into three themes: overcoming challenges, school leadership and programme maturity.

8.2. Overcoming challenges

The challenges and limitations of the implementation of the MBRSLP in 2015-16 highlight several important points for the future growth of the programme. It should be emphasised that in the United Arab Emirates there is a continued positive outlook towards the MBRSLP from the teachers and principals, a reaffirmation of the centrality of connectivity in the programme, and a recognition of the need to address the current issues with device failure and lack of in-school support.

Positive attitude of teachers and principals

Despite the challenges in the 2015-16 implementation noted in chapter 4, the attitude of teachers and principals toward the MBRSLP remains remarkably positive. Teachers maintain a positive attitude regarding the use of ICT in the classroom, 96% 'agree' or 'strongly agree' that technology can be used to improve learning, 84% agree that the quality of teaching has increased as a result of the programme, and 78% report an increase in their enjoyment of their work as a teacher. It is clear that, despite day-to-day challenges and technical

difficulties, teachers continue to show confidence in the programme, and belief that ICT is a valuable and productive tool in the classroom and the education system.

Principals also demonstrated a positive attitude towards the overall programme, 92% 'agree' or 'strongly agree' that they enjoy using ICT in their work, and 99% 'agree' or 'strongly agree' that technology can be used to improve learning. Principals were also confident that the programme will continue to benefit students, with 92% responding that the programme will have a positive impact on student learning in the next year. These findings demonstrate principals' continued buy-in and confidence in the benefits of the programme and ICT for their schools, teachers and students. The overall consistency in responses between teachers and principals is also noteworthy and reflects an increasingly refined understanding from the principals regarding the impact, successes and challenges of the programme as experienced by teachers.

Connectivity

The challenges of the 2015-16 implementation highlight the central importance of having reliable and robust whole-school connectivity for the MBRSLP to be successful. In the online surveys, 24% of principals considered that poor internet connectivity had had a 'negative' or 'very negative' impact. From the interviews with the deployment team, it was also clear that this key area had seen a marked change from the connectivity that had been achieved in previous years. In teacher focus groups many teachers expressed frustrations with the way that internet failures disrupted their teaching. Connectivity has particular implications for facilitating increased communication among teachers, principals, parents and students; for enabling innovative and collaborative methods for teaching and learning; and for increasing student engagement and enthusiasm. The challenge of poor connectivity provides an important contrast to previous years. While some ICT for education programmes may not embed connectivity at the core, the challenges of the MBRSLP in 2015-16 affirm that 'smart learning' is about more than simply implementing devices: it is about the connections, collaboration and creativity that those devices facilitate. The transformative potential of the MBRSLP is dependent on reliable and robust internet connectivity.

Device failure and limited support

An increasing number of schools have had reduced use of student devices in class, because of the high level of device failure and limited support. Lack of support and delays in addressing daily issues has led to a tipping point in usage where teachers cannot depend on enough students having usable devices to incorporate them into their lesson plans. Thus the actual use of devices in the classroom is undermined by the lack of a critical mass of devices to enable students to use them. Among the devices available to them, teachers were least confident about the reliability of the student devices: 18% reported them to be 'poor' or 'very poor'. One teacher commented in a focus group that 'most of the students have some problem with the devices,' and another, that 'for the students' devices, they are not able to use even one website ... and they easily get viruses as well'.

Teachers and principals commented on the reduction in support this year to fix and repair broken devices. In regards to fixing the laptops, one principal reported in an interview 'for

the old tablets, we are not getting service quickly - last year it was faster, they were fixed the same day, but this year the service is different. The smart boards in the classrooms also need maintenance but it is not fast. If there is a problem, there is a delay in the fixing.' Twenty-one percent of teachers and 30% of principals reported that the promptness of repairing devices in the case of technical support request was 'poor' or 'very poor' this year, while in 2014-15, 10% of teachers and 11% of principals felt this was 'poor' or 'very poor'. Similarly, 22% of teachers and 20% of principals felt that, this year, the effectiveness of the adoption team in ensuring that ICT equipment works well was 'poor' or 'very poor', an increase from 2015, when 6% of teachers and 3% of principals felt this was 'poor' or 'very poor'.

One male teacher in Umm al-Quwain said in a focus group discussion, 'for us it is a smart programme, but it needs a lot of support,' and a male teacher in Sharjah commented that 'When the programme first started, we had a lot of people supporting us to make it successful. There was someone to come and help and fix things any time we had a complaint - now we don›t have that.' These findings demonstrate that teachers and principals continue to require daily technical support in order to fix device failures and challenges, to enable them to maximise the use of the devices in the classroom. It is necessary that an efficient, effective and sufficiently resourced support service is reintroduced to enable the repair of both devices and screens. Despite the changes in usage patterns, teachers continue to engage positively with the MBRSLP, and the holistic nature of the MBRSLP's educational change management programme has continued to impact their pedagogical approaches. This finding highlights both the centrality of comprehensive device support, and the importance of maintaining teacher commitment to the full educational change management programme.

8.3.   School leadership

The MBRSLP has identified principals as being crucial to the educational change programme, both in terms of leading their schools in the use of the MBRSLP and also in receiving training for professional development. Research from previous years has shown that principals who have engaged actively in the MBRSLP have catalysed effective participation in the MBRSLP (see MBRSLP annual research 2013-14, MBRSLP annual research 2014-15). The findings from 2015-16 highlight the importance of actively engaged and equipped principals, and school visits affirmed that principals who proactively participate with the MBRSLP are more effective.

The principal professional development programme offers a strategic opportunity for influencing key stakeholders within the on-going implementation. There are highly encouraging indications that the principal development programme can significantly help schools to engage with holistic transformation rather than simply technology implementation. The openness of principals to ICT, and the innovative pedagogy that ICTs can facilitate, is crucial to successful implementation of the MBRSLP. The principal development programme helps principals to lead the way in driving change and to not feel side-lined by the new technology.

The professional development programme and school transformational framework has worked very effectively throughout the changes of 2015-16 and will have an increasingly

central role to play in the future of the MBRSLP, ensuring that schools have the capacity to use technology strategically to manage their own change process. The training of principals through the professional development programme lays a foundation for future strength. Their increased understanding of strategic change through technology in their schools, and increased capacity for critical thinking regarding their technology needs, means that the programme is actually embedded in how education is conceptualised and undertaken.

8.4.   Teachers at the centre

It is teachers who have the highest degree of day-to-day interaction with students, and increasingly have contact with them even outside of the classroom through the SLG and even social media. Thus, it is important for teachers to be fully equipped and empowered in their role. More teacher training should have taken place in 2015-16 and their future training should be prioritised in order to see maximum positive impact on classroom practice.

Effective principals recognise the important role of their teachers and the need to enable their effective use of the programme and advocate for them. A male principal from Dubai highlighted, 'the most important thing is the teacher, the teacher is the core in the programme - I want the teacher to become super professional, to have knowledge about how to learn everything in smart learning, and to apply it to the students.' The same principal acknowledged the need for equipping teachers with the necessary expertise to achieve maximum benefit of the programme: 'there should be one technical guy, someone who knows all applications, knows about the programme, how it works, to exist in the school in a daily basis ... he should attend classes, see how the teachers and students act, if there is something wrong, he should lead them.'

There is evidence that teachers who have been participating in the programme for longer are helping newer teachers to use the tools. Despite this, there is a lack of in-school support and training available for teachers. The availability and responsiveness of support has decreased this year, with 18% of teachers and 20% of principals reporting that the promptness of technical support in response to reporting a problem was 'poor' or 'very poor', while in 2015, only 6% of teachers and 7% of principals felt this was 'poor' or 'very poor'. In both the online survey and focus group discussions, teachers felt that increased in-school support would enable them to make greater use of the tools provided and increase their confidence in the classroom.

Principals and teachers also made the suggestion that schools participating in the programme could be better connected in order to share lessons and offer peer support. A female principal from Sharjah said, 'I recommend conference videos with teachers in other schools, so that we can watch each other›s lessons on a weekly basis, with a different subject each time. This would help to exchange the information between schools.' A number of teachers also made this recommendation during focus group discussions. For example, a female teacher in Dubai said, 'we need access to other schools and teachers ... we have the student corner for smart learning, but we need to be able to exchange information, resources, learn from each other.'

A male principal in Dubai articulated the regularly repeated suggestion that there should be dedicated, in-school support to develop teachers' knowledge and capacity in using ICT in the classroom: 'we are supporting one another for any technical issue, we need training and courses … but not only lectures; [a specialist] should attend and see how the teacher is going about his knowledge [in the school]. This is very important. It›s not about giving the teacher tools, devices, smart board and letting him go on his way, there should be a leader for him.' Continued work in developing specialised pedagogical support and peer support networks for teachers can multiply the positive impact of the programme in future years.

8.5. Programme maturity

Teacher adaptation to the MBRSLP

Teachers have asserted that they are adapting to the MBRSLP as it becomes further embedded in schools, and this is consistent with the indication that teachers with more experience with the MBRSLP are informally assisting those who are newer to the programme. One of the biggest initial challenges of the MBRSLP for teachers was an increased workload. Teachers cited examples such as 'more time required for preparing lessons', and spending 'more time communicating with students outside of classes' as significant outcomes of the programme. However, in this year's survey, fewer teachers indicated that the MBRSLP has led to an increase in their workload (73% in 2015-16, 84% in 2014-15, and 92% in 2013-14). This may indicate that teachers are adjusting to the programme and becoming more familiar with the tools, or may indicate that the programme is simply becoming a less prominent aspect of their work. Which of these is the more dominant theme will become apparent in future years.

Student behaviour

Alongside previous concerns of teacher workload, issues regarding student behaviour emerged, referring to the potential distracting influence of the MBRSLP. More teachers, however, indicated this year that the MBRSLP is having a positive impact on student behaviour (53% in 2013-14, 60% in 2014-15, and 70% in 2015-16). These figures may indicate that teachers are adjusting to classroom management with the programme, and are now more confident in managing the behaviour of students than in the initial deployment, as they have indeed suggested in focus groups. Another contributing factor may also be students' adaptation to the programme - any new programme or new educational intervention can be disruptive to the classroom and can shift too much focus towards the platform of learning, away from the actual subject material to be learned. As students become more comfortable with the MBRSLP, they can use the relevant tools as an effective means through which to enhance learning outcomes.

Integration

The changes in programme responsibilities, transition of ownership to the Ministry of Education, and adaptation to the new curriculum have been defining issues for the MBRSLP in 2015-16. Challenges remain as the programme expands to more grades and schools. However, teachers reiterate that they want improved access to better and more unified teaching resources, and this indicates a clear opportunity for improvement. Teachers

have not given up, nor been stripped of their independence in developing lessons, so the opportunity remains for the MBRSLP to collaborate with the Ministry of Education to produce further high quality digital content embedded with the new curriculum. Despite this, teachers commented on the lack of alignment between the curriculum, exam content and the smart learning content, and the challenges this brings to their teaching. A male teacher from Ajman explained, 'there is a problem with the Ministry of Education changing the curriculum every year - we can't coordinate the digital content with them.' Another male teacher from Dubai echoed this sentiment: 'the curriculum last year was new and there is now a difference in the subjects in what is covered in the digital content. There are even differences between the papers and what we have available digitally. We need a new update to make it consistent.' Similarly, a male teacher from Sharjah commented: 'it's a good programme, but we have smart-learning, and also the question bank, and also the curriculum. There is so much difference in question bank questions with what we teach. Every programme asks us to do something different. There needs to be some integration between the channels.'

International recognition

The MBRSLP is gaining international recognition which brings increasing opportunities to give advice, share experiences and mentor counterparts in other countries. The International Telecommunications Union has recognised the United Arab Emirates as a regional knowledge hub for smart learning because of the work of the MBRSLP. This has led to significant exposure internationally and to more opportunities to spread the learning that has taken place. This is a considerable achievement in the relatively short lifespan of the programme thus far. The achievements of the programme have enabled the United Arab Emirates to increase its participation in the global dialogue regarding innovative approaches to education.

8.6.   Conclusions

The third year of the MBRSLP has confirmed that connectivity is at the heart of technology-enhanced learning, that principals have a central role in leading their schools and motivating teachers to inspire their students, and that with the growth and expansion of the programme comes the need to keep focused on recognised areas for improvement.

There are particular challenges encountered when running a strategic change programme which operates within a broader system that is undergoing a significant amount of independent change. This is the experience of the MBRSLP in 2015-16 operating within the changing environment of the Ministry of Education. A central component of the MBRSLP mandate is to build capacity within the whole education system for the effective use of technology. It can be seen from the experience of the programme, and from similar initiatives in other countries, that building such capacity requires significant time and sustained effort.

The technical limitations of the 2015-16 implementation have led to an overall decrease in teacher and student usage and engagement in the programme. However, it remains to be seen whether this is a long term trend or simply a one-year challenge that the programme would inevitably face within the context of such high levels of external change and transition. Indeed, it is remarkable that despite the technical challenges

regarding connectivity and device support, there are still increasing levels of ICT-facilitated collaboration in the classroom, and increasing levels of teacher and principal conviction regarding the positive impact that ICT has on student learning outcomes. Principals and teachers have a very high degree of satisfaction with the strategic direction of the programme, alongside some frustrations regarding the current technical challenges that are limiting aspects of their engagement.

The MBRSLP has effectively managed to integrate services with the Ministry of Education while at the same time overseeing an expansion in programme reach. This is a notable and rare achievement which may lead to improved future outcomes if commitment to the programme can be sustained. Many programmes stall following initial implementation when challenges are encountered during scaling and it becomes difficult to sustain momentum. If the programme can overcome the current difficulties then there are encouraging signs that it will be able to continue to grow and mature. The MBRSLP has positioned education within the United Arab Emirates as one of the leading smart services sectors. The on-going strategic investment into educational change will continue to position the United Arab Emirates as a leader within the region.

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