



The Innovation Imperative: Adding Fire to the Fuel of Genius in UAE Schools?

Carol Webb¹

Abstract

This paper provides an overview of innovation strategy prioritized globally implemented in the education sector in schools, with particular reference to the example of the United Arab Emirates (UAE). Data from a 2018 qualitative survey of 12 school teachers/leaders representing 9 different UAE schools from 4 separate emirates are presented and results are discussed to elaborate the extent to which innovation is currently embedded and the impact it is currently recognized as having - as evidenced by such indices as innovation prizes, registering patents, or other indicators suggested by research participants. Key results of the survey are shared. Nine enablers and 10 barriers for innovation in schools and 6 recommendations for practice are presented. Recommendations for further research include a need for a UAE 7 emirate-wide survey. The value of longitudinal research is suggested to chart the emerging narrative of innovation in schools to capture long term impacts.

Keywords: innovation, UAE, schools, enablers, barriers, school improvement

Introduction

This paper examines how innovation strategy is being implemented in UAE schools. A qualitative survey of 12 school teachers/leaders representing 9 UAE schools (across EYFS/primary/secondary) from 4 emirates was conducted to explore how innovation is currently embedded in schools. Key results of the survey are shared in the context of the UAE National Innovation Strategy (NIS) following a description of methods used. Finally, a list of school level enablers and barriers of innovation are presented, with recommendations for practice and further research.

Context

Global level Organisation for Economic Co-operation and Development (OECD) policy emerging from the Centre for Educational Research and Innovation (CERI), and in particular the 'Innovation Strategy for Education and Training' (2018), explores and urges new ways to be found to equip people with skills needed for innovation. Innovation as part of an educational agenda is now seeing the installation of innovation labs in schools in America and beyond (Webb, 2018; Traweek, 2017 and 2018), and schools and students in the UAE have a mandate to innovate.

Using the definition of innovation as, "the aspiration of individuals, private institutions and governments to achieve development by generating creative ideas and introducing new products, services and operations that improve the overall quality of life" the UAE NIS (Ministry of Cabinet Affairs, 2015) has earmarked education as one of its 7 innovation priority sectors² to drive future innovation and create a culture of innovation countrywide. High quality education is at the heart of the strategy to facilitate the country achieving its innovation ambitions through key enablers: developing a first-rate education system; focusing on research and development at universities; and promoting innovation/entrepreneurship incubators (ibid.). Innovation champions are being sought for nurturing and development at an early age (Ministry of Cabinet Affairs, 2015). It was the intention of this research to assess the extent to which progress had been made towards achieving these goals of the NIS within 9 UAE schools from 4 emirates.

Research Methods

Building on previous work on innovation in a variety of contexts (Webb, 2018; Webb, 2008; Dvir et al,

¹ Middlesex University Dubai, UAE

² The 7 priority sectors are: renewable and clean energy, transportation, technology, education, health, water and space.

2007; Dvir et al 2006; Webb et al, 2006; Wolf et al, 2008; Dvir et al, 2004), a qualitative survey was conducted in April 2018 with 12 research participants from 9 UAE schools, representing 4 of the UAE's 7 emirates. This was a purposive, non-probability convenience sample of a known group of 12 current and aspiring school leaders from a micro sample of 9 UAE schools out of a possible 809 total³ (1.11%). A breakdown of schools in the study is provided the following table:

| UAE Emirates Represented in Study | No. of schools | MoE Schools | Private For Profit | Private Non-Profit | American Curriculum | British Curriculum | IB | MoE Curriculum |
|-----------------------------------|----------------|-------------|--------------------|--------------------|---------------------|--------------------|----------|----------------|
| Abu Dhabi | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| Dubai | 6 | 1 | 4 | 1 | 0 | 4 | 2 | 0 |
| RAK | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| Sharjah | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| Ajman | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Fujairah | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Umm al-Qaiwain | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 9 | 2 | 6 | 1 | 2 | 4 | 2 | 1 |

Table 1: A summary of emirates represented in the study by number of schools, status and curriculum (Author's own, 2018)

Ethics approval was obtained and following completion of the survey results were tabulated and schools were numbered for reference: Dubai 1-6, Abu Dhabi 1, RAK 1, Sharjah 1. Respective respondents were numbered R1-R12. Forty questions were posed (mixed open/closed responses). Anonymity of respondents/schools was maintained but background data was used to analyse relationships between variables as shown in tables below:

| | Dubai 1 | Dubai 2 | Dubai 3 | Dubai 4 | Dubai 5 | Dubai 6 | Abu Dhabi 1 | RAK 1 | Sharjah 1 |
|------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|----------|--------------------|----------|--------------------|
| Curriculum | British | British | IB | IB | British | British | American | MoE | American |
| Status | Private for-profit | Private non-profit | Private for-profit | Private for-profit | Private for-profit | MoE Gov. | Private for-profit | MoE Gov. | Private for-profit |
| Age of School | 11yrs | 3yrs | 3yrs | 13yrs | 20yrs | 5yrs | 25yrs | - | 15yrs |
| No. of Students | 1582 | 1040 | 997 | 1655 | 1800 | 735 | 1550 | 700 | 1200 |
| No. of Teachers | 151 | 60 | 234 | 145 | 95 | 86 | 330 | 47 | 72 |
| Nationality Served | Internat. | Internat. | Internat. | Internat. | Internat. | UAE | UAE | UAE | UAE |
| Language Medium | English | English | En/Fr/Ge | English | English | English | English | Arab/En | English |
| Student Age Range | 3 to 17 | 3 to 14 | 3 to 18 | 4 to 19 | 3 to 19 | 11 to 18 | 3 to 19 | 13 to 21 | 4 to 18 |
| Last Inspection Rating | Good | N/A | N/A | Good | Good | V Good | Good | Fail | Acceptable |

Table 2: Summary of background information pertaining to schools studied (Author's own, 2018)

³ There are currently 809 schools (including public and private) in total in the UAE according the government statistics obtained via the UAE schools map web page:

<https://www.moe.gov.ae/En/AboutTheMinistry/Pages/MOEMap.aspx>

| | School | Age | Nationality | Time in UAE | Yrs in Teaching | School Role | Leadership Responsibilities |
|-----|-------------|-----|-------------|-------------|-----------------|--------------------------------------|-----------------------------------------------------------------|
| R1 | Dubai 1 | 36 | British | 11yrs | 9yrs | Yr4 Teacher | Former EAL dept head for primary & secondary |
| R2 | Dubai 1 | 47 | British | 8 | 12 | Deputy Head | Key Stage 1 & Foundation |
| R3 | Dubai 2 | 54 | Indian | 20 | 26 | Primary Head | Monitoring teaching and learning of core subjects and languages |
| R4 | Dubai 2 | 37 | Filipino | 10 | 17 | Teacher & SLT member | Head of secondary section |
| R5 | Dubai 3 | 32 | Irish | 7 | 10 | Deputy Head of Primary | Pastoral care, teaching and learning support |
| R6 | Dubai 3 | 30 | Irish | 6 | 7 | PE Teacher | Primary Curriculum Lead |
| R7 | Dubai 4 | 39 | Australian | 8 | 18 | Yr6 Teacher | Primary Science Leader, curriculum and professional development |
| R8 | Dubai 5 | 43 | Kenyan | 17 | 20 | Nursery Director | Curriculum, teaching and learning, staffing, management |
| R9 | Dubai 6 | 40 | British | 4 | 14 | ICT / Comp. Sci Teacher | CS4G Club |
| R10 | Abu Dhabi 1 | 35 | Egyptian | 5 | 12 | Teacher & EY Leader | Learning coordinator |
| R11 | RAK 1 | 34 | British | 2 | 6 | Creative Design & Innovation Teacher | Professional Development |
| R12 | Sharjah 1 | 51 | Indian | 16 | 19 | ESL Teacher | ESL Coordinator |

Table 3: Summary of background information on 12 research participants (Author's own, 2018)

Qualitative, subjective questions were asked, exploring ways the school delivered the UAE innovation strategy. Data were themed using standard techniques and findings were cross-referenced with background data. A range of key findings was then derived.

Findings

All schools gave evidence of emerging innovation-focused activity, with some evidence of innovation outputs/ indicators. Two schools (Dubai 3 and 5) had innovation labs, and four (Dubai 5, 6, RAK 1, Sharjah 1) reported students and/or staff winning innovation prizes. One school (Dubai 3) provided students with instruction on patents/intellectual property – in the context of ‘academic honesty’ for IB grade 6 and above. No schools reported patents being written/registered by students/teachers yet. Six schools (Dubai 1 to 6) were aiming to deliver against the UAE vision for innovation– but in 3 schools (Abu Dhabi 1, RAK 1, Sharjah 1) there was no evidence of that.

All respondents were able to provide a definition of innovation, with an underlying theme of **creative problem solving for benefit**. Two schools (Dubai 1, Dubai 5) included the word ‘innovation’ in school values; 1 of these, Dubai 5, also with an innovation lab, had innovation activities, teaching and learning embedded throughout the school, demonstrating leadership in supporting innovation through “technology, engineering and construction” delivered by “trained staff” in “well-equipped rooms” (R8). This school’s students participated in regional competitions and won prizes in 2015/2016.

Dubai 3 had an innovation lab and taught on patents and intellectual property from grade 6 up on the IB curriculum. As yet there were no outputs in terms of innovation prizes or patents/intellectual property registration by staff/students. Dubai 6 (secondary 11-18) reported students and teachers winning awards. They are a UAE MoE school following the British Curriculum, rated ‘very good’, with key strengths including ‘technology integration’ (R9), delivering the UAE strategy for innovation through STEAM projects, and competition participation (e.g. EmiratesSkills/ThinkScience). Innovation was embedded in engineering, physics and computer science subjects, and systematically embedded in curriculum through lessons plans, group projects and exhibitions. School leadership took a structured approach to facilitating innovation in school, and supported innovation through staff CPD.

Abu Dhabi 1, Rak 1 and Sharjah 1 were working on school improvement. R12 of Sharjah 1, (rated ‘acceptable’), reported lack of quality staff CPD and lower salaries holding the school back, but “they have established a new quality-assurance unit in the school”. RAK 1 failed its last school inspection, and R11 reported it at a very poor standard (weaknesses: “management”/“lack of direction”). Abu Dhabi 1 (rated ‘good’) had high leadership turnover, and weaknesses in curriculum/resourcing (R10), correlating with lack



of evidence of the school aiming to deliver the UAE vision for innovation. In these 3 schools leadership for innovation was missing, in addition to having a greater distance to travel on the journey of school improvement.

From these findings 10 barriers of innovation in schools as reported by respondents were derived:

1. **Strategic focus**
(Dubai 3: R6: *"A lack of clear direction and an understanding as to what innovation looks like"*)
2. **Financial resources**
(Abu Dhabi 1: R10: *"Resources, budgeting as it's not on the school's priority"*)
3. **Teacher training/CPD**
(Dubai 2: R3: *"Lack of knowledge on the subject and how to develop this in the classroom"*; Dubai 4: R7: *"Lack of [...] professional development for teachers"*)
4. **Knowledge/best practice sharing**
(Dubai 3: R6: *"I am sure there are innovative practices taking place at the school but none of these are being shared with staff"*)
5. **Teacher motivation**
(Dubai 2: R3: *"Lack of [...] motivation of the teachers to be creative in their own teaching"*)
6. **Teacher flexibility**
(Dubai 2: R4: *"Teachers who are not open to move from traditional to modern approach"*)
7. **Timetabling attention**
(Dubai 2: R4: *"Lack of time - school timing is fixed"*; Dubai 3: R5: *"a school that truly championed innovation would have the ability to collapse a student's or group of students' timetable(s)"*)
8. **Exam driven curricula**
(Dubai 2: R4: *"The pressure of completing the curriculum content and preparing students for internal and external exams"*)
9. **After-school activities**
(Dubai 2: R4: *"Lack of time - school timing is fixed and majority of the students cannot stay back due to transport issues"*)
10. **Positive school community culture**
(RAK 1: R11: *Changing the mindset of some students and parents"*; Sharjah 1: R12: *"staff members inhibit and annihilate any desire to innovate among teachers and learners"*)

While the above 10 barriers provide a focus for problem-solving within schools, it was also possible to derive 9 school enablers of innovation from the study as a starting point for change:

1. **Strategic direction**
(Dubai 2: R4: *"Create an innovation committee to support and encourage innovation"*; Abu Dhabi 1: R10: *"Partnership with other schools and companies"*)
2. **Resources**
(Dubai 1: R2: *"Classroom resources"*; Dubai 4: R7: *"Needs to be actively encouraged and funded accordingly"*)
3. **School culture**
(Sharjah 1: R12: *"Treating teachers and learners [...] to self-improve and build their self-confidence, [...] constructing a trust-based relationship between administration, teachers and learners"*)
4. **Teacher CPD**
(Dubai 1: R1: *"CPD sessions on encouraging it in school"*; Dubai 2: R3: *"Regular and sustained effort of educating the teachers and students on the need to be creative and innovative"*)
5. **Best practice/knowledge sharing**
(Dubai 3: R6: *"Sharing of best practices with staff and students"*)
6. **Teacher motivation**
(Dubai 2: R3: *"Motivating the teachers to increase the opportunities for students to show creativity"*)



7. Teaching and learning

(Dubai 2: R3: "Increase the level of higher order thinking in lessons"; Sharjah 1: R12: "Changing one's mindsets about teaching and learning")

8. Timetabling

(Dubai 2: R4: "Have an innovation day once a month"; Dubai 6: R9: "Allocated timetable"; RAK 1: R11: "Extra curricula activities after school")

9. Competing

(Sharjah 1: R12: "Venturing to take part in national and international competitions")

These barriers and enablers create a fulcrum towards understanding ways systemic school improvement can be achieved to deliver the UAE NIS.

Conclusion

In order to fulfill the ambitions of the UAE NIS in the education sector, schools should evaluate their own context and needs in this regard and create an action plan for impact through continual school improvement.

6 Recommendations for practice include:

1. Allocating school lead for innovation
2. Development of school innovation policy
3. Developing school culture, CPD, routines/practices, teaching and learning around innovation
4. Addressing timetabling issues accommodating an innovation culture
5. Encouraging participation in innovation competitions
6. Visiting Google Innovation Hub opened for school access - UAE University, Al Ain (Ednet, 2018)

Recommendations for further research include a UAE survey of schools from all 7 emirates, representing MoE schools and all private school types, inspection category and all curricula. In addition to monitoring of progress and developments of innovation in schools, there is a justifiable need for longitudinal research to elaborate the emerging story of UAE innovation strategy initiated through education to capture long-term impacts of innovation strategies in schools. Creating the right enabling culture and environment for innovation to emerge and exposing young minds to it will help to ignite the fire to fuel genius within UAE schools and beyond.

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