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External strategies for improving national education systems: policies and implementation practices by which *The digital school* is achieving scale

EXTERNAL STRATEGIES FOR IMPROVING NATIONAL EDUCATION SYSTEMS: POLICIES AND IMPLEMENTATION PRACTICES BY WHICH «THE DIGITAL SCHOOL» IS ACHIEVING SCALE

This article describes a digital educational system and its impacts in various countries. For a nation to enhance its education system, ideas, strategies, and models from outside the country are important. Also, as countries become more diverse through other ethnic groups immigrating, an educational system may become less effective unless adaptations are made. However, because education is a means of ideological transmission and socialization into a country's beliefs and values, typically nations are wary of outsiders seeking to serve their students. The Digital School (Tds) is a nonprofit initiative in its fourth year, sponsored by Mohammed bin Rashid Al Maktoum Global Initiatives from the United Arab Emirates (Uae). Tds is developing, implementing, and refining a model for digital education for marginalised communities around the world. Tds partners with countries attempting to enrich their national education curriculum for currently underserved marginalised students and to enable those students to learn digital skills. Frameworks from the scholarly literature are discussed to illustrate the challenges of an external group offering to enrich a country's education system. The Tds model is articulated: vision, mission, and values; a digital ecosystem for learning; educators' professional development; partnerships already attained with a variety of countries; and strategic outreach. The article then discusses findings from evaluative interviews of stakeholders about Tds operations in four countries. Evidence supports two hypotheses: 1) Tds is seen as an agent for delivering each country's national curriculum to underserved and marginalized groups with fidelity, as well as for equipping students with digital skills that prepare them for future life and work, and 2) Tds' adoption policies and implementation practices are based on Trust, Coordination, Co-learning, and Co-invention, consistent with the research literature on this topic.

KEYWORDS *National Educational Systems, Marginalised Students, Digital Skills, Adoption, Implementation.*

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1. The challenge of improving national educational systems

Globally, almost all countries have national educational systems with prescribed content and processes. How these standards are implemented and enforced by each country's government varies (Reimers and Chung 2016). For example, Mexico has a very detailed curriculum that can extend to mandating specific lessons. Their ministry of education provides national textbooks and teacher guides. At the opposite end of the spectrum of centralised vs decentralised control of education, the United States has minimal national standards for curriculum and instructional processes, providing guidelines that allow a broad range of interpretation. Most countries are somewhere between these two extremes.

Regardless of specific policies and practices, all countries view their national educational systems as important mechanisms of economic development and socialization. The Oecd Future of education and skills 2030 curriculum analyses (Oecd 2020) identified several policy issues commonly faced within Oecd members, as well as other nations across the world. Managing the time lag between today's curriculum and future needs is challenging given the pace of change and disruptive innovation in the 21st century. Also, curricular overload in the limited schooling time available generates problems in conveying the content, skills, attitudes and values students need. In addition, as curricula and instruction evolve, equitably implementing those innovations is difficult. Further, migration is making many countries more diverse, leading to strains for educational systems and creating difficulties in providing quality education for groups marginalised within the country's culture.

To meet these policy challenges, importing ideas, strategies, and models from outside the country are important. However, because curriculum and instruction are means of ideological transmission and socialization into cultural beliefs and values, typically nations are wary of outsiders seeking to serve their students with different models of teaching and learning. Even given the rising emphasis on globalization, individual countries are jealously guarding the content and processes of their national educational systems (Green 2019).

Foreign language education is an example of a curricular area in which many studies have documented implementation challenges across the world (Yedigöz-Kara and Bumen 2022). In a meta-synthesis, ten evidence-based studies across seven countries found common issues with teachers' qualifications at the micro-level, lack of support and infrastructure at the meso-level, and lack of guidance or misalignment between curricular change and high-stakes testing policy at the macro-level. The authors recommend (*ivi*, 357):

Firstly, when designing a curriculum adopting a global approach, local realities and needs should be analysed better at the macro-level. Secondly, a coherent message should be delivered with curricular change. For a coherent message, the other policies such as testing policy, college admission, or teacher education policy should be addressed within the curricular reform as they have a role in the implementation.

Beyond top-down control and guidance, an empirical study of curricular change in Vietnam documents the importance of teacher buy-in and agency (Nguyen and Bui 2016). Data were collected from interviews and classroom observation of the teachers to shed light on their visions and practices in responding to a reform policy in English language instruction. The findings indicate that teachers are highly capable of exercising their agency as comprehensive policy implementers, both by resisting curricula they feel are defective and by working towards meaningful pedagogical transformations when they approve of the shift.

Fitzsimons and Johnson (2020, 31-32) developed four principles to guide the collaborative process of external participation in national curriculum development and implementation:

- *Trust*: relevant knowledge and information should be shared. The specific knowledge, perspectives and skills of each partner should be trusted as having value.
- *Coordination*: partners should be working towards a common goal. Differences in time, space, sociocultural environment and resources should be taken into account and appropriately accommodated to ensure a common goal can be worked towards.
- *Co-learning*: there must be a recognition that upskilling and knowledge acquisition will occur on all sides of the partnership, with the epistemic status of partners shifting depending on the skill and knowledge that is required. Co-learning also involves the ability for different parties to challenge and critique one another in a constructive way. Co-learning should not only be planned in the early phases of the project, but should also occur organically as particular knowledge and skills emerge as being valuable.
- *Co-innovation*: the final «product» should be a result of co-innovation, which means it should be a collaborative process that results in innovative and bespoke solutions that specifically emerge as a result of the collaboration.

This framework suggests strategies for infusing external enrichment into a country's national curriculum. The next section describes the insights and

strategies underlying Tds as an outside agent aiming to help marginalised students across the world.

2. The digital school initiative

This section describes a digital educational system and its impacts in various contexts. Since its inception in November 2020, the vision of The digital school (Tds) stems from His Highness Sheikh Mohammed bin Rashid Al Maktoum's statement at the launch of Tds: «our goal is to bring digital learning to new horizons as it is the education of the future and the future of education» (Government of Dubai Media Office 2022). Tds has a larger purpose beyond just equipping a series of online and hybrid schools; its aspirational mandate is to develop, implement, and refine a model for digital education for marginalised communities around the world. Tds' objectives are to deliver quality education empowered by applicable digital means, in order to enable wider access to academic learning and help bridge the education gap. Its approach seeks to aid participating countries in meeting their goals for diversity, equity, and inclusion in their educational systems.

Over the past three years, Tds team has developed the Tds model and conducted outreach for this educational system through a non-profit organization specializing in digital education for marginalised communities worldwide. Tds is based on a holistic approach toward digital transformation in education, illustrated in this six-dimensional model.



FIG. 1: The Digital School analytical framework.

Source: Author's own elaboration.

This suite of strategies is intended to meet to varying needs across countries and communities. As documented later, Tds has been flexible in de-

veloping its interventions and partnerships, adapting each implementation via a structured, phased change-management program.

In all cases, the national curriculum of each country serves as the foundation for Tds learning experiences. This curriculum is digitalized in ways that seek to enable active learning by students. For example, Tds does not simply make a .pdf of a paper-based reading but instead adds various types of interactivity in electronic form, such as opportunities for further explanation and embedded questions for students. Through these shifts in instruction, Tds aims to transform learning experiences for students, seeking to move away from traditional teacher-dominated, onsize-fits-all lessons towards a more personalised, self-directed approach. The goal is for each student to learn at his/her own pace, with support to meet their learning needs and challenges to suit their aspirations. Doing this digitally potentially offers significant opportunities, removing many of the barriers of traditional learning environments, and enabling learning to take place across a wide range of times and locations (Bonk and Zhu 2024).

Through Tds approach, whether students learn in a face-to-face classroom or online, they have the opportunity to acquire digital competencies beyond the knowledge and skills the national curriculum is teaching. These digital competences are based on the Digital kids asia pacific (Dkap) framework, published by Unesco in 2019 (Unesco 2019):

TABLE 1. *Standards - Digital Kids Asia Pacific framework*

| Principles | Rights-Based, Child-Centric Approach |
|-------------------------------------|---|
| Prerequisites | Equity in Quality of Access to Ict |
| Domains | Competencies |
| 1. Digital Literacy | 1. Ict Literacy 2. Information Literacy |
| 2. Digital Safety and Resilience | 1. Understanding Child Rights 2. Personal Data, Privacy, and Reputation 3. Promoting and Protecting Health and Wellbeing 4. Digital Resilience |
| 3. Digital Participation and Agency | 1. Interacting, Sharing, and Collaboration 2. Civic Engagement 3. Netiquette |
| 4. Digital Emotional Intelligence | 1. Self-Awareness 2. Self-Regulation 3. Self-Motivation 4. Interpersonal Skills 5. Empathy |

(continues)

(follows)

| | |
|--------------------------------------|----------------------|
| 5. Digital Creativity and Innovation | 1. Creative Literacy |
| | 2. Expression |

Source: Author's own elaboration.

This extension of the national curriculum is intended to aid students in preparing for technology-enhanced work and life locally, nationally, and globally (Dede and Richards 2020).

Based on research and international best practice in curriculum design, Tds curriculum model identifies three main learning pathways:

- Pathway 1: Core national curriculum subjects - maths, science and main language of instruction (language A). Tds scanning indicates that these core subjects are common in most national curricula worldwide. These are typically identified by governments as priority subjects and therefore form Tds' starting point with each new location. The core national curriculum subjects are provided in the country's main language/s of instruction.
- Pathway 2: Extended national curriculum subjects - second languages (language B), humanities/ social studies, the arts, and technologies. These subject groups are usually represented in national curricula worldwide and are in all Tds countries, although the specific subjects within each group vary. These extended national curriculum subjects are provided in the country's main language/s of instruction.
- Pathway 3: Enrichment content - this covers a broad range of programs, created and curated by Tds in an attempt to achieve specific relevance for each local context, including life skills, vocational programs, social-emotional learning, and academic support. Enrichment content is provided in one or more of Tds languages, depending on identified needs and implementation locations.

In every Tds country, each instance of enrichment content is approved by the Ministry of Education, so the nation retains control over students' learning experiences.

No two Tds communities or cohorts are identical: each has a different starting point; each has different circumstances, challenges and enablers; and each can implement at a different pace. Tds applies a core principle of contextualising to meet local needs, so with implementation of its Learning Model the initiative applies an incremental approach that seeks to adjust expectations,

allows sufficient time, and provide ongoing support for students and educators to build the necessary confidence and skills.

Tds incremental implementation process identifies four stages on the journey towards self-directed student learning:

- Stage 1: Instructional: learning is teacher-directed, with students working independently only on some steps of their learning. For example, they might prepare questions of personal interest and do some investigation, with constant instruction from their teacher.
- Stage 2: Guided: students take more independence for some steps of their learning. For example, they prepare questions, plan what resources to use, and do small-scale independent investigation with close guidance from their teacher.
- Stage 3: Collaborative: students follow most stages of the curriculum independently, in close collaboration and with frequent check-ins with their teacher.
- Stage 4: Independent: students follow all of curriculum independently and refer back to their teacher only when they need support.

The incremental implementation process is applied in each new location, embedded as part of the Country Plan. It is guided by Tds Monitoring, evaluation, research, and learning (Merl) protocols, in order to monitor starting points and progress through the stages towards student selfdirected learning.

Tds teacher capacity building

Tds must have well-prepared educators to teach and support the students. In the locations where digital education is most needed--where students are most marginalised and have least access to education--the lack of skilled educators is a crucial factor contributing to the students' lack of access. This includes overall shortages of teachers entering the profession, poor training, high absenteeism, safety concerns, low pay, inadequate facilities and working conditions, all more acute in the areas of highest needs (Yedigöz-Kara and Bumen 2022).

In response, Tds has partnered with Arizona State university to create a structured sequence of asynchronous, self-paced online courses intended to prepare educators to teach online. The original sequence of courses was designed specifically to prepare educators to teach online using Tds Learning management system. As Tds has engaged with different countries and communities, the worldwide digital transformation movement has accelerated, driven by the

pandemic, with a corresponding growth in demand for accessible, affordable training for teaching in online environments. The Digital educator global academy (Dega) was created as a joint initiative between Tds and Arizona State university to respond to that demand, for all teachers--not just those teaching with Tds.

Through Dega, educators worldwide have the opportunity to create their own personalised learning pathways, accessing a broadbased menu of quality courses from a range of well-regarded Higher Education entities. Over time, Tds vision is to extend Dega to include different specialities and different styles of professional development, leading to microcredentials and certifications.

Tds present status: students, teachers, and countries served

Tds currently supports around 160,000 beneficiaries and 1000 educators in eleven countries across the Middle East, South America and Southern Africa. Previous pilots were implemented in Afghanistan, Bangladesh and Colombia; and future growth is scheduled in Mongolia, Uzbekistan, and ten more Southern African countries.

In five of the current countries (Egypt, Iraq, Jordan, Lebanon and Mauritania), there is full implementation of both teachers' training as digital educators through the Digital Educators Global Academy and students' digital learning through Tds Learning Management System. Operations in these countries have steadily expanded both in scale and scope since the start of each partnership. Egypt and Jordan were two of Tds' first countries, joining in 2021, and the others joined in 2022.

The other six current countries (Angola, Lesotho, Madagascar, Namibia, South Africa and Zambia) joined in 2023, and in 2024 these partnerships started with teachers' training and digitalisation of the national curriculum content, in preparation for students' digital learning to be implemented in the coming school year.

Evaluation of Tds adoption and implementation across multiple countries

This section summarizes evidence related to two hypotheses about why Tds has an unusual and exemplary rate of adoption as a provider of national curricula in many countries. The first hypothesis is that Tds is seen as an agent for delivering each country's national curriculum to underserved and marginalized groups with fidelity, as well as for enriching their students with digital skills that prepare them for future life and work. This is consistent with the

theories described above about decision making related to national education systems (Green 2019; Oecd 2020).

The second hypothesis is that Tds leadership has developed implementation policies and practices based on the four principles for external participation in national curriculum development articulated by Fitzsimons and Johnson (2020). Discussed earlier, these principles center on Trust, Coordination, Co-learning, and Co-invention.

To test these two hypotheses by collecting evidence, Tds staff conducted a series of structured interviews in four countries with selected stakeholders at three different levels:

- Educators. Teachers and facilitators who are responsible for implementing the Tds model with students in classrooms and digital learning spaces, including lesson plans, learning activities, and assessment
- School leaders. Principals and coordinators who are responsible for implementing the Tds model at school level, including scheduling, systems, and processes
- Policy makers. National and regional leaders who are responsible for strategic decisions relating to engaging with and implementing the Tds model.

In analyzing the interviews, the statements and perspectives of all stakeholders are anonymized.

The next sections summarize the evidence collected related to both hypotheses above about adoption into a national curriculum. The author, an external advisor to Tds, prepared this synthesis of insights from their evaluative process.

Evaluative methods

Tds staff developed a set of interview questions that explored contextualisation, motivation, decision-making processes, challenges, alignment of key principles and values in partnerships, and the desired next steps from the stakeholder's perspective. From that central set, three interview protocols were crafted, tailored for the context of each level of stakeholder. The questions were originally phrased in English, the common language of Tds staff and the author, and then for use with interviewees translated into standard Arabic by a Tds team member, using ChatGpt with personal editing. These processes aimed to produce consistency of language form and meaning. As an illustration,

the Interview protocol for policy makers in education is delineated in the Appendix to this article.

Tds elected to conduct interviews rather than surveys, for several reasons:

- direct past experience of conducting surveys with Tds stakeholders yielded low response rates and took too long;
- general understanding about survey methodology indicated that this past experience was typical and therefore would likely recur;
- the ideas Tds wanted to explore required complex language that would likely be challenging for some stakeholders, from both conceptual and linguistic perspectives;
- this was further complicated by the need for translation of the initial questions from English to Arabic, and then the translation of responses from Arabic to English – interviews would allow clarifications that surveys do not;
- interviews would recognise the cultural value of oral interactions that still dominate in these locations, especially in the marginalised communities that Tds serves;
- interviews would make personal connections with the stakeholders, which are important for Tds ongoing relationships.

So, Tds embarked on a series of semi-structured interviews: a common set of themes for all stakeholders and a common set of questions for each category of stakeholders, with interviewers' flexibility for some adaptation and elaboration for clarity, if needed. Interviewers rehearsed the protocols together to further consolidate common understandings of each question. Similarly, if interviewees were hesitant or gave abbreviated responses, it was agreed to judiciously use follow-on prompts to clarify or elaborate as needed. Interviewees were requested to respond in standard Arabic to facilitate subsequent translation and transcribing, although they did not always comply for the whole of the interview. It should be kept in mind that not all interviewees were fluent in spoken Standard Arabic, and therefore this flexibility was felt to be essential to ensure the main gist of each question was conveyed.

Interviewees for each category were selected in two main ways:

- they were individually selected by Tds from previous interactions as known individuals with first-hand knowledge of and involvement with the project in that location, or

- they were nominated by the local team or ministry as individuals responsible for implementation of the project at a strategic or policy level.

In both cases, it was felt that the interviewees were able to accurately represent the local experience from their different stakeholder perspectives.

Tds staff initially targeted at least one interviewee from each category in each location, giving sixteen in total. However, the categories of stakeholders are not clearly distinct in some locations. For example, in Egypt the one-room schools typically have 2 community teachers and one assistant, mostly untrained and unqualified. There is no separate school leader. It was considered to interview some educators using the educators' questions and others using the school leaders' questions. However, this option was dismissed as being inappropriate, as the educators in these schools do not have leadership responsibilities or decision-making authority and would not be able to respond authentically to the leadership level questions. So, in this situation we used only the teacher interview protocol.

In other categories and locations, interviewees were more readily available, so more interviews were conducted. The final headcount was twenty-three:

TABLE 2. Interviewees by country and category

| | Educators | School leaders | Policy makers |
|------------|-----------|----------------|---------------|
| Egypt | 4 | 0 | 1 |
| Jordan | 2 | 1 | 1 |
| Lebanon | 5 | 3 | 1 |
| Mauritania | 3 | 1 | 1 |

Source: Author's own elaboration.

On reflection, it is possible that Tds could have fulfilled the original plan, by selecting only one interviewee from those available, or afterwards, by selecting only one response. However, given the complexity of language, recording, transcribing and translation, on balance, it was decided that to include all available interviews would give a more representative overview.

The interviews were conducted by six Tds team members, with three focusing on educators and school leaders, and three focusing on policy makers. Interviews were conducted using Ms Teams or Zoom, and each interview was recorded. Each interview took between 30 and 50 minutes. The interviewer delivered a short, standardised introduction explaining the purpose and structure, and then led the interviewee through the set of questions. The interviews

were then transcribed and translated if needed, using various tools, including MsWord Transcribe, ChatGpt and Turboscribe.

Limitations of these methods

One of the main limitations was language. The language of most interviewees was Arabic but, as noted, they did not always comply with the request to speak in standard Arabic, which complicated the translation and transcription. A written survey format would have avoided this challenge, as respondents would have used standard Arabic. Although as already noted, this would likely have limited the responses or excluded some interviewees from participating at all.

Also, the content of the questions was complex and conceptual, and interviewers frequently had to paraphrase, clarify or elaborate to aid interviewees' understanding. When this was reported anecdotally by the interviewers, a was conducted to determine the extent that this had been necessary. The survey indicated that all interviewers had used this technique to some extent (scale of options was not at all / to some extent / extensively).

Also, the use of six different interviewers introduced some variation into the process, although this was mitigated by the rehearsing of the questions and protocols.

Further, the tools used for transcription and translation were not standardised, so different interviewers used different tools, which also allowed slightly different outputs. With all tools, personal editing was needed, and this introduced a further element of inconsistency.

In addition to the language challenges highlighted above, other factors also increased the risk of response bias from participants:

- the perceived 'power-distance' relationship between Tds and different stakeholders. For example, the educators regard Tds as a government authority while the policy makers interviewed regard us as a partner or provider; these perceived relationships influence responses;
- social desirability bias, linked to the relationships mentioned above, but also influenced heavily by culture, responses given can be what the interviewee thinks the interviewer wants to hear.

Despite these limitations, the evidence provided from the interviews provides a suggestive confirmation of both hypotheses, as discussed below. Rigorous confirmation would require more types of evidence from a larger sample collected by multiple methodologies.

3. Findings

Descriptions of the interview findings are grouped into four countries

Lebanon

Tds has operated in Lebanon for two years and currently serves 5230 students and 291 educators across 5 locations. A policy maker involved in national-level decisions about Tds as an external provider stated: «governments always will be sensitive about how do you educate or what do you teach children. Because of that, each country has their own curriculum. Using the national curriculum ensures alignment with national values and students' safety».

This leader also stressed the value of digitizing the curriculum and providing computer skills for students. Even refugee students who had never used a computer had no problem using the digitalized curriculum, enhancing equity in educational support. The importance of building teacher capacity was highlighted, and the Digital educator global academy was praised as a resource. This person said, «The digital school's role in this transition is a qualitative addition to support the shift towards future digital education. Our plan is to continue improving the level of digital teaching alongside traditional methods».

When asked about the four dimensions of implementation, the leader described a «bridge of trust» between Lebanon's national decision makers in education and Tds. In terms of Coordination, Tds was praised for their respect for local culture and for developing a Learning management system (Lms) customised to that culture. Co-learning and Co-innovation occur in meetings of top managers held every three to six months in which the processes and outcomes of curricular lessons are discussed. The interview closed with the statement: «we are working on seeking support from funders, donors, and international partners to enhance this digital education initiative and learn from experiences in other countries».

Three school leaders were interviewed in Lebanon. Their statements reinforced the themes discussed by the national leader. One principal described a success story involving an older teacher who initially struggled with the digital platform: «With continuous support and training from the content team, he became proficient and now competes with newer, tech-savvy teachers». Certificates and rewards proved motivating for students: «one student recei-

ved four Tds achievement certificates and was motivated to attend school outside of regular hours to follow her lessons».

Another Lebanon principal indicated that, thanks to the digital platform: «Each teacher, staff member and school principal are able to follow-up with students' progress regularly without any issue. The first step in integrating technology with learning was very good and successful with all age groups. We can clearly see their enthusiasm and motivation about it». The third principal discussed how teachers «are enhancing the implementation of new self-directed strategies. The more teachers develop technologically, or the more they open up the horizons of their development, the more they have new windows for success in new areas of education».

All the principals also discussed challenges in implementing the Tds model. «In Lebanon or the Arab world, the internet was a significant issue. We managed to set up broadcasting devices in our centers, but in the tent, a strong internet connection was needed for students to access their accounts from a distance. Second, tablets should be available for every student at home. Many Arab families often share a single device». All principals wished for additional funding to strengthen the technical infrastructure and appreciated Tds efforts in that regard.

Every principal indicated Tds support and student/teacher success has led to Trust and Coordination: «Yes, we are always supported by Tds and solutions are offered with any issue that we face from email, platform, or any difficulty that we face. The communication and collaboration with Tds are not 100%, but 1000% exceptional». This has led to Co-learning and Co-innovation: «the recently added enrichment programs on the Tds platform were a big success. Not only did they engage the students, but we were also able to involve parents and community members in activities such as drawing, painting on glass, embroidery, crochet, and Arabic calligraphy».

The five teachers in Lebanon interviewed reaffirmed the support they receive. Representative quotes include:

«Even my confidence as a teacher is that I am delivering content professionally at a high level, because in the end, I have all the tools in front of me, PowerPoint, videos, everything that can visually, auditorily, and sensorily impact the student deliver the information».

«For example, in biology, the student receives information directly from the teacher through the digital classroom or traditional teaching methods. The benefit is that the student can access the Tds platform, revisit the material, and use all related educational resources, which is very beneficial».

«For example, if we wanted to modify or add something to the curriculum to better suit our students' age group or intellectual stage, The digital school has been very responsive. I could make adjustments that fit our students and teachers as well».

«The digital school has always listened to our ideas and needs. We even held discussion sessions to update the learning platform, last summer. The best example of that is when I decided to integrate gamification in my teaching and using new digital learning tools in my lessons».

«For instance, the platform provides a lot of rich educational resources and continuous support like workshop and training to enhance the digital learning experience».

Overall, the responses from these three types of stakeholders in Lebanon affirm the two hypotheses, while indicating work in progress on the adequacy of technical infrastructure.

Jordan

Tds has sponsored schools in Jordan for three years and currently serves 1199 students and 100 educators across two locations. A Jordanian policy maker expressed satisfaction that marginalized students in the Mrajeab camp were now receiving a quality education via Tds. «Students enjoy their classes through the interactive discussions between them and their peers in other digital schools worldwide. Parents were thrilled with the achievements of their children, who have acquired a range of skills, whether technological or educational, through the digitalized school textbook». This person advocated an expansion of Tds to the Khazen camp. Tds is on a path toward increasing equity and inclusion within Jordan.

When asked about the four dimensions of implementation, the Jordanian policy maker stated, «There is absolute trust between The digital school's administrators, the teachers, and the students in the digital classrooms. Our goal is unified and shared (Coordination), whether we are educational supervisors, teachers, or those running The digital school. The planning done in collaboration between the educational supervisor, the teacher responsible for delivering the material, and The digital school team (Co-learning and Co-innovation) represents the pinnacle of our achievements».

In terms of challenges, the policy maker cited issues with technical infrastructure: «The real gap lies after the digital class session. When teachers go to the staff room or their homes, they face challenges in achieving their goals, as I mentioned earlier, regarding the availability of devices and a reliable internet connection to communicate with their peers and students. Social and cultural

environments and resources are generally provided, thanks to the efforts of the Uae Red Crescent. This adaptation, in fact, allows teachers to achieve their goals in The digital school classrooms and fulfill their assignments».

One school leader in Jordan was interviewed. That person reiterated many themes discussed by the national leader, particularly a shortage of devices, and added: «the most important challenge is that, as I mentioned, our age group is the age group from grade one to six. At this age they all see these devices and tools as gaming tools. Teachers trained students on the fact that these devices are not just a game, but rather they are educational devices. The teachers took training courses in digital education; the great thing about The digital school is that training sessions are always available on the platform. Also, administrators value that monitoring and supervision of the teachers regularly occurs through their performance records, where each teacher maintains a documented record of their work in The digital school».

In terms of the four dimensions of implementation, the principal indicated, «I have high confidence in The digital school, and I believe it greatly contributes to the academic achievement of the students (Trust). It understands our needs (Coordination), but I think it might not meet all the needs because of the large number of students and teachers. Certainly, there must be joint plans between both parties to develop the innovation process (Co-learning and Co-innovation), even between the traditional school and The digital school, to achieve something exceptional and better than what we currently have». A current limitation expressed was, «The current programs are useful and age-appropriate, but as I mentioned, I wish they covered all grade level students and subjects other than the core subjects».

Two teachers in Jordan were interviewed. They discussed themes similar to the national leader and the school principal. One teacher emphasized the importance of Tds offering the national curriculum: «the educational materials and resources available in The digital school consider the values of the community and adhere to the national curriculum, ensuring that students are not exposed to harmful content or advertisements that could disrupt their values and customs». That teacher also indicated, «the digital school provides students with a learning experience that is full of creativity and innovation. As a teacher, I apply these lessons and transfer my expertise to the students to fulfill the school's mission. We are working to connect these marginalized students to the reality surrounding their camp, and also to the digital reality that they have never seen in their life».

The second teacher praised the capacity building they had received via the Digital educator global academy: «In terms of digital education, I consider I am well-prepared thanks to the training I received from The digital school,

and after the digital school lessons, I also became more capable to manage the digital classroom well. I was one of the first teachers who joined the first cohort of the course from the University of Arizona as a digital teacher, and I also won first place in this course in all three levels». Challenges cited included «some of the challenges revolved around the use of technology and the student's conviction that this is a good and useful alternative to the traditional classroom. We were also facing challenges such as lack of the availability of devices inside homes, but thanks to the development of the digital education in the camp, students have become able to frequent the digital classroom more and is able to access the digital platform at any time he wants. It also helps them overcome shyness and introversion, making them feel more comfortable participating».

Overall, the responses from these three types of stakeholders in Jordan affirm the two hypotheses, while indicating work in progress on the adequacy of technical infrastructure.

For reasons of space, the responses from the next two countries will focus on themes not already covered by the prior discussion.

Egypt

Tds has operated in Egypt for three years and currently serves 7442 students and 295 educators across 202 locations. The leader of a partnering Ngo, the World food program, indicated, «the digital school was actually the missing link for us to reach the target of having a product of a student capable of continuing the journey of modern education. The difference in space and social culture - this was overcome by adoption and mindset». Coordination, Co-Learning, and Co-Innovation were highlighted: «Even in the very first day when The digital school was just an idea to be implemented in the Egyptian context, we had a lot of sessions to plan how this would best be designed to fit the context. For example, we have a challenge related to Syrian students. They can enroll in public schools, but they face bullying and a lot of challenges fitting in. So with our work with The digital school, we roll out a pilot for this in the Syrian refugee context».

Making progress on equity and inclusion is important for the Egyptian government, particularly in rural areas and with immigrant populations. «When we talk about inclusion, gender inclusion, there is also in rural areas, the preference of keeping girls at home, not sending them to schools. Parents are more accepting to the idea of sending their girls to Community Schools because these Community Schools are within the same village».

The Tds model in Egypt is one room schoolhouses in remote areas, so no school leader was available. Four Egyptian teachers were interviewed; representative quotes include:

«When The digital school came, it saved me so much time. I could be teaching a science lesson to fourth grade while fifth and sixth grades are working on their smart boards, taking the science lesson on their own, watching, entering, and solving their exercises, so it saved me a lot of effort. Also, the students themselves have changed their readiness for studying. Before, a student might sleep while you are explaining the lesson, but now, no. They compete to get the laptop or tablet to work on it, to solve the exercises themselves».

«The digital school gave us the opportunity for self-learning via the Edraak platform at any time, allowing us to learn useful things and also the content team trained us on how to create a pre-test and a post-test while following international standards and excellent content. The digital school always gives priority to the e-safety and security of the students while using the platform for learning, especially when preparing lessons and content».

«In our society, old traditions are passed down among them, including not educating girls. The highest level is 5th grade; then they let the boys work and earn money and the girls help with household work. However, after Tds and the digital transformation, some of them progressed to middle and high school, which is a significant achievement».

«Sometimes there is no internet access to interact on the platform, or certain links from the Knowledge Bank are unavailable, especially for grades 4 and 5, as the community education curriculum is limited. Also, there is no content for Social Studies, Religious Education, and English on the platform. The number of tablets in the school doesn't cover all students, so two or more students may have to share a device to interact with it».

Overall, the responses from these two types of stakeholders in Egypt affirm the two hypotheses, while indicating work in progress on the adequacy of technical infrastructure and the currently limited span of curricular materials.

Mauritania

Tds has operated in Mauritania for two years and currently serves 19,511 students and 193 educators across 68 locations. The Mauritanian policy maker expressed: «adopting the national curriculum is very important to ensure that all digital content is aligned with the educational plan approved within each country. Every student is attracted to what is interesting and related to the use of electronic tools. I think that lessons in their digital form, as well as educational tools in their digital form, are overall very attractive to any student and

also assist the teacher in saving time. Regarding equity, ensuring that students receive the same lesson, effort, and conditions is also important. Digital education, if generalized, will ensure broader equity in terms of students accessing the same information».

In terms of the dimensions of implementation, the policy maker stated: «Without close coordination between us and The digital school, this collaboration would not have continued. Indeed, we have encountered significant challenges, which we have overcome through a high level of coordination. Sometimes, we do reach points of intense discussion between us at the local level and The digital school, especially when it comes to certain issues we disagree on. These discussions can become quite heated at times. However, in the end, we always find a common ground to overcome these challenges (Trust, Co-learning, Co-innovation)».

The Mauritanian school leader described multiple challenges: «If we had enough time and sufficient training, there would have been great results. There is no result for the students and the school now because of the challenges. We lack internet connectivity, devices, and time. Continuous digital skills training for teachers and students is needed». However, the principal was optimistic about the future, «Mauritanian teachers have a level of ownership through which they can adapt to everything, but they need support and help. I am certain that education in the future will inevitably be digital».

Three Mauritanian teachers were interviewed. Representative quotes include:

«Trust is there, and there is confidence in the sense that Mauritania is ready to support with The digital school to help us and our students. At present, if we had devices, the Internet, and more communication with The digital school, we would innovate better with the students».

«For shared learning, The digital school offers a rich and innovative experience that helps overcome classroom challenges, like overcrowded classes. For co-innovation, the mere act of students using digital devices fosters innovation and discovery. For coordination, we have some challenges as the local representatives here in Mauritania are not always available and don't always provide us with the needed support».

«There is advanced education, there is digital curricula and students can study at any time they want, even at home. Students can study independently, and quickly do their homework at home, thanks to the excellent digital content on the platform. I think this is the Co-Innovation part with Tds. The challenges here in Mauritania are mainly the lack of devices, especially for the fifth and sixth grades. There are approximately more than one hundred students, and we only have eighteen devices, which is not enough of course. What

I usually do like other teachers, is to use our phones or bring our devices to address the lack of devices».

The responses from these three types of stakeholders in Mauritania affirm the hypothesis about national curriculum and equity, while indicating some frustration with the four dimensions of implementation. This is to be expected for any innovation in its early stages: reaching full capacity and building Trust and Coordination take time and effort. Overall, Mauritians expressed optimism about the future of Tds in that country.

4. Summary

This article has described an educational experience and summarized evidence related to two hypotheses about why Tds has an unusual and exemplary rate of adoption into national curricula in many countries. Consistent with the research-based theories described earlier about decision making related to national education systems, the first hypothesis is that Tds is seen as an agent for delivering each country's national curriculum to underserved and marginalized groups with fidelity, as well as for enriching their students with digital skills that prepare them for future life and work. The evidence from the interviews conducted with stakeholders in four different countries provides suggestive support for this hypothesis. National leaders, school principals, and teachers all affirmed the importance of Tds adherence to these principles.

The second hypothesis is that Tds leadership has developed successful implementation policies and practices based on the four research-based principles for external participation in national curriculum development: Trust, Coordination, Co-learning, and Co-invention. The evidence from each country is suggestively supportive of this hypothesis, but the degree of confirmation varies depending on the length of time Tds has been active in that nation. In early stages of implementation, stakeholders report significant challenges but retain faith in Tds as a partner in overcoming these issues. Trust, coordination, and collaborative actions are not instantly received by innovators; these attributes build over time and experience.

The countries described are different in many ways, and the confirmation of hypotheses across these is suggestive about the flexibility and adaptivity of the Tds model. Findings from the interviews support that, for an external group to enrich a country's educational system, the strategies Tds uses are helpful, practical, and well received across a range of cultures, governance systems, and educational objectives. These insights are of value for all policy set-

ters and decision makers who wish to improve education outside of their local context.

The factors that emerge as persistent challenges for Tds are consistent with the research literature on educational improvement via digital technologies. Fishman and Dede (2016) extensively discuss the types of barriers and issues that arise in technology-enriched teaching and learning. Two of these on which Tds seems effective are attaining equity for marginalized groups and building teacher capacity for digital instruction and assessment. A third, developing requisite technological and curricular infrastructure, is especially difficult in rural areas, Global south countries, and in multicultural contexts, but Tds is demonstrating that, with time, resources and effort, these challenges may be overcome.

Advances in online learning have the potential to enable worldwide implementation proven educational improvements (Dede and Lidwell 2023). Developing models such as Tds to overcome challenges discussed in this article is essential for achieving quality at scale.

For reasons of length, this article is unable to discuss Tds work from an improvement science perspective. Digital education dialogues (2024), a podcast series sponsored by Tds, has episodes that further describe the initiative's strategies while situating each in the context of related work in the field. The interested reader is urged to view these for further information.

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References

- BONK, C. J., and ZHU (朱美娜), M. (2024), "On the Trail of Self-Directed Online Learners", *ECNU Review of Education*, 7(2): 406-419.
- DEDE, C., and LIDWELL, W. (2023), "Developing a Next-generation Model for Massive Digital Learning". *Education Sciences*. doi: 10.3390/educsci13080845.
- DEDE, C. and RICHARDS, J. (eds.). (2020), *The 60-Year Curriculum: New Models for Lifelong Learning in the Global Digital Economy*, New York, Routledge.
- DIGITAL EDUCATION DIALOGUES (2024), "A Podcast Series Sponsored by The Digital School". <https://www.linkedin.com/showcase/digital-education-dialogues/posts/?feedView=all>.
- FISHMAN, B., and DEDE, C. (2016), *Teaching and Technology: New Tools for New Times*, in D. Gitomer and C. Bell (eds.), *Handbook of Research on Teaching*, 5th Edition, American Educational Research Association, New York, Springer, 1269-1334.
- FITZSIMONS, S. and JOHNSON, M. (2020), "How Collaborative Project Development Theory can be used to Provide Guidance for International Curriculum Partnerships", *International Dialogues on Education*, 7(2): 24-39.
- GOVERNMENT OF DUBAI MEDIA OFFICE (2022), "Mohammed Bin Rashid launches First Phase of The Digital School", *Five Countries*, 28 February, <https://mediaoffice.ae/en/news/2022/Feb/28-02/The-Digital-School-establishes-strategic-partnerships-to-enhance-digital-learning-solutions>.
- GREEN, B. (2019), "Introduction – National Curriculum, International Perspectives", *Curriculum Perspectives*, 39: 179-180.
- NGUYEN, H. T. M. and BUI, T. (2016), "Teachers' Agency and the Enactment of Educational Reform in Vietnam", *Current Issues in Language Planning*, 17(1): 88-105.
- OECD (2020), "Technical Report: Curriculum Analysis of the Oecd Future of Education and Skills 2030", Paris, Oecd. Available at https://www.oecd.org/education/2030project/contact/Technical%20_Report_Curriculum_Analysis_of_the_OECD_Future_of_Education_and_Skills_2030.pdf. Last accessed July 10, 2024.
- REIMERS, F. M., and CHUNG, C.K. (2016), *Teaching and Learning for the Twenty-first Century: Educational Goals, Policies, and Curricula From Six Nations*, Cambridge, Harvard Educational Press.
- UNESCO OFFICE BANGKOK AND REGIONAL BUREAU FOR EDUCATION IN ASIA AND THE PACIFIC (2019), *Digital Kids Asia-Pacific: Insights into Children's Digital Citizenship*, Paris, Unesco. Available at <https://unesdoc.unesco.org/ark:/48223/pf0000367985>. Last accessed July 10, 2024.
- YEDİGÖZ-KARA, Z., and BÜMEN, N. T. (2022), "The Search for Effective Curricular Change Adoption in Foreign Language Education: A Meta-Synthesis", *International Journal of Curriculum and Instructional Studies*, 12(2): 337-366.

Appendix

Interview protocol for policy makers in education

The digital school is gathering information about operations in different locations, to better understand our impact to now, and to help us plan the most effective support for the future.

We will ask you a series of questions. There are no right or wrong answers. Please answer from your own opinions and experience.

1. To what extent was it important that Tds adopted your national curriculum and assessments? To what extent was it important that Tds was responsive to the local context and culture of the students served?
2. Was the development of digital skills in students and teachers using Tds seen as providing additional value? What was attractive about this for students? For teachers? For families and local communities?
3. To what extent was Tds adopted to achieve goals of diversity, equity, and inclusion for students in your country who were not receiving full educational services?
4. To what extent was Tds' successful implementation in other countries a factor in your adopting this model?
5. What was the underlying theory of change in adding Tds? Within the country, who was involved in its implementation? What challenges have emerged, and by what processes are they overcome?
6. To what extent does your country's collaboration with Tds illustrate each of these four principles? (Please give a specific example for each.)
 - * Trust: Do you and Tds share relevant knowledge and information? Are the specific knowledge, perspectives and skills of each partner trusted as having value?
 - * Coordination: Do you feel that you and Tds are working towards a common goal? Are differences in time, space, sociocultural environment and resources taken into account and appropriately accommodated towards that common goal?
 - * Co-learning: Do you feel that this is a learning experience for you and for Tds? Do you challenge and critique one another in a constructive way?

- * Co-innovation: Are you developing and implementing innovative and bespoke solutions that specifically emerge as a result of the collaboration with Tds?
- 7. What do you envisage as next steps for your country's education system?