Qatar's Edtech Testbed:

Building Collaborative Partnerships for Innovative Teaching and Learning Outcomes



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WISE Edtech Testbed 2022 Report

Seungah S. Lee, *Stanford University*

Victoria Basma, *World Innovation Summit for Education*

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EXECUTIVE SUMMARY

Edtech testbeds can help address challenges and barriers for effective implementation of technology in educational settings, as they seek to provide "an environment to test and experiment with edtech solutions in a real-world setting" (Batty et al., 2019).

In the 2021-2022 academic year, WISE ran its first full cycle of an edtech testbed in an effort to accelerate innovation through edtech within this learning ecosystem based on learnings from the testbed pilot (see Lee & Basma, 2021). In doing so, WISE hoped to increase local practitioners' understanding of edtech use, and how it could be leveraged to overcome persistent problems of practice in the classroom. Developing a community of edtech specialists within Qatar and Qatar Foundation schools also presented a new opportunity to create a sustainable community of practice that could support innovative approaches to learning and capture improved practices.

The idea of establishing this type of network locally was also a key component of WISE's overall ambition: developing a toolkit so that global partners could replicate similar initiatives in their own contexts.

With that said, testbeds are notoriously difficult to manage. Juggling the expectations of multi-level stakeholders, along with the task of delivering research, is no easy feat, but WISE believed that with the right partnerships and a collaborative approach to implementation, a learning ecosystem capable of realizing the potential of technology could begin to form in Qatar.

Findings from this year's edtech testbed revealed that edtech platforms, such as an e-Learning platform, can prove to be a valuable teaching and learning resource, supporting the teachers' work to scaffold and differentiate learning for students across the language learning spectrum. Findings also revealed that fostering a relationship beyond that of service provider-client relations between the edtech venture and the schools is critical. Involving the edtech venture in the training and development process for schools and their teachers, in addition to having a school-champion in the form of the "Chair of Digital Learning," were critical to increasing teacher engagement and use with the edtech platform. This was also important for building a collaborative environment



between the edtech ventures and participating schools, resulting in a feedback loop where the teachers received guidance, resources, and support to better employ the learning platform, and the edtech ventures had opportunities to receive real-time feedback about their product.

This report concludes by providing key lessons and recommendations that emerged from the 2021-2022 cycle of the edtech testbed. Learnings from this year will allow WISE to adapt our approach to testing edtech products and building collaborative partnerships with schools and edtech ventures. Ultimately, we expect this testbed to progress through various iterations as we move closer to delivering our global toolkit. Each iteration will aim to address evolving practitioner needs, and in turn, help create an environment where innovation, testing and experimentation are supported.

INTRODUCTION

1. INTRODUCTION

A number of studies related to educational technology (edtech) and classroom pedagogy have underlined the idea that learning design, rather than the tool or technology itself, is responsible for student success (Busch & Mott, 2009). From computer-aided testing platforms, adaptive learning applications, gamification, and to AI-enabled personalized learning, edtech has been able to offer novel teaching and learning tools. This proliferation of technology has also presented new depths of student data, allowing teachers to adapt and evolve their practice in order to meet the reported needs of each individual in the class (Ostrow, Hefferman, & Williams 2017). In essence, technology, specifically educational technology, has offered educators the opportunity to address various problems of practice, innovate pedagogy, further engage students in the learning process, and help reduce administrative work so that teachers can focus on what matters most: teaching and learning.

Despite the potential and "promise" of edtech, it has fallen short of expectations (Scanlon et al., 2013). Whilst AI, gamification, VR and AR have certainly begun to alter the way we design learning experiences, studies have shown that the impact of technology on student learning remains mixed at best (OECD, 2015). Among the reasons for such mixed results is the complex nature and dynamics of teaching and learning. Although technology can aid the teaching and learning process, one must remember that technology is merely a vehicle that delivers and/or supports instruction and is not itself responsible for student learning. The essence of learning remains in the hands of the teacher. The interaction between appropriate technology and meaningful pedagogy is what allows for impact on student learning. For example, one study on use of smartboards in the United Kingdom revealed that the effective use of the technology improved student learning when used by teachers interested in developing creative and critical thinking skills in their students (Higgins et al., 2005). In other words, technology is at its best when it is used as a medium for intentional learning design and curated classroom experiences.

In this context, increasing efforts have been directed toward understanding how technology can be best used in classrooms to help teachers and student meet specific overarching standards and objectives, and achieve learning goals. The various frameworks developed to support this effort range from internal strategies within schools and school districts, to specific curricular and technology standards such as those stipulated by the International Society for Technology in Education (ISTE), and the International Baccalaureate (IB) curriculum.

Whilst there is a wealth of information on *what* teachers should be achieving, there is little information on *how* they can best *utilize* and employ a plethora of edtech solutions in the classroom. First, although technology has increasingly been integrated into the classroom in recent years, teachers often do not fully understand how to use edtech solutions effectively, and how to use analytics provided by edtech solutions to meaningfully inform their learning design (Batty et al., 2019; Pihlajamaa & Rantapero-Laine, 2020). Moreover, the lack of reliable, relevant evidence on effective selection of edtech, make it more difficult for teachers and school leaders to make informed decisions about the *what* and the *how* of integrating and implementing edtech solutions in their respective classroom and school contexts (Cukurova et al., 2019). Additionally, there is a lack of research that examines how schools can create productive partnerships with edtech providers, both so that they can receive feedback from users, and so that those users —central stakeholders like teachers, parents, and students— can play a role in influencing the design and implementation of classroom solutions.

Edtech testbeds seek to fill the gap between schools and edtech providers by providing an environment to test and experiment with edtech solutions in real-world settings. The idea behind an edtech testbed is relatively simple: provide a school with a piece of technology and develop a tool that meets the needs of a modern classroom through teacher feedback, observations and data analysis by the research partner (Eriksson et al., 2018; Batty et al., 2019). In fact, edtech testbeds are particularly useful in that they help schools test and experiment with edtech products suited to their needs, with hands-on support in understanding what works and generating actionable insights for schools and edtech ventures. This then allows learners, teachers, and schools to make more effective use of technology

and data. Indeed, an iterative and experimental approach to testing edtech solutions provides an opportunity to make innovation safer while maximizing real-world impact. It offers ways to learn how new ideas, technologies, and solutions can be applied to address challenges in learning environments (Rae et al., 2019).

Given the above, this report seeks to answer:

1. How can testbeds effectively build edtech venture-school partnerships to foster an environment where new edtech products can be tested and utilized towards innovative practice in the classroom?

2. How can larger transformations within pedagogy and learning take place through edtech use?



THE WISE EDTECH TESTBED

2. The WISE Edtech Testbed

The WISE Edtech Testbed presents a relevant setting to answer this report's central questions, given WISE's position within Qatar and its education ecosystem. The WISE Edtech Testbed is unique in that WISE, its parent organization, oversees the WISE Accelerator program. For over six years, the accelerator program has worked with and supported entrepreneurs and edtech startups focused on creating better access to quality education globally. This has allowed WISE to create a pipeline of potential service providers for the edtech testbed. The selected edtech ventures for the testbed are trusted, established partners, giving WISE and participating Qatar Foundation schools confidence in the ability of the selected venture's product to meet the schools' needs. In essence, WISE serves not only as a broker and coordinator between the edtech venture and local schools in Qatar, but also as an identifier of edtech products that could provide value and solutions to teaching and learning needs in the schools.

In 2020, WISE launched its first edtech tested pilot in Education City, Doha, in an effort to introduce new edtech products into the schools and leverage these tools to overcome persistent problems of practice in the classroom. Developing a community of edtech specialists within Qatar and Qatar Foundation schools also presented a new opportunity to create a sustainable community of practice that could support innovative approaches to learning and capture improved practice.

The pilot phase (see Lee and Basma, 2021) revealed the importance of recognizing that both the edtech venture and schools operate in complex contexts with various goals and purposes. Edtech ventures need to be able to test their product or solution, and receive feedback from participating schools so that they can improve it to meet the needs of users (i.e. students and teachers). Schools need to be able to observe whether an edtech product or solution helps meet the identified needs and challenges in the school (e.g. improving student outcomes in specific subjects, better management of lesson plans and student assessments). The pilot study found that there needs to be commitment from the schools and teachers to actively utilize the edtech product in their practice. For the testbed to be successful, it was also found that the edtech venture needs to actively provide support so that teachers become familiar with the product and its most effective use.

Learning from the pilot phase of the testbed, the 2021-2022 cycle of the WISE Edtech Testbed was developed based on the following:

1. WISE Edtech Testbed is to be the “bridge” between the schools and edtech ventures, facilitating rapport and communications between the two entities.

2. The edtech venture will be selected out of current and former participants of the WISE Edtech Accelerator program, chosen based on needs of Qatar Foundation schools (as identified by surveys and focus groups conducted in collaboration with Qatar Foundation).

3. Qatar Foundation schools will self-select to participate in the testbed, with the expectation that participating school leaders will communicate with their relevant teachers regarding the testbed and committing to actively testing and utilizing the edtech product in the classroom.

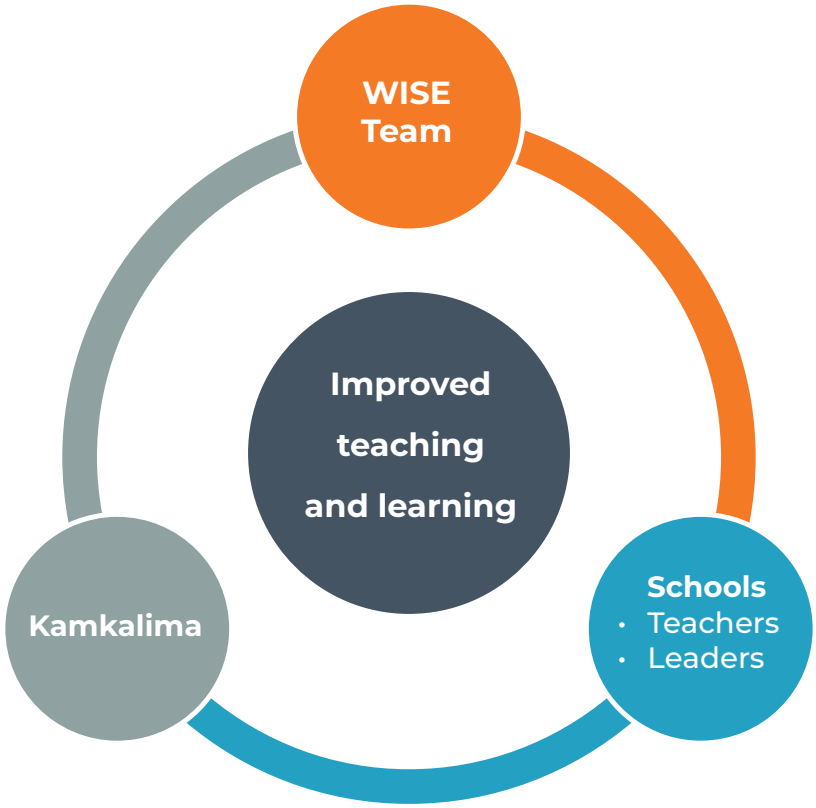
4. WISE team, in collaboration with the edtech venture, provides monthly professional development and technical support to the teachers.

5. Participating teachers are expected to take the learning from sessions with the WISE/edtech venture teams and apply them in their lesson planning and classroom practice.

6. WISE team observes lessons and stays in communication with participating teachers and school leaders to provide further support as needed.

7. Through monthly professional development and debrief sessions with the edtech venture, teachers would have opportunities to provide feedback on the edtech product, helping edtech ventures further validate and improve their product.

Figure 1. WISE Edtech Testbed



2.1. Selected edtech platform: Kamkalima

The edtech venture chosen for the 2021-2022 WISE Edtech Testbed cycle was Kamkalima, an Arabic educational platform for learning and teaching in schools. Kamkalima seeks to empower Arabic classrooms with the needed tools and resources (Kamkalima, 2022). It delivers digital content in Arabic that is aligned with national and international curricula, and covers the key language competencies of reading, writing, and listening. It also offers learning and assessment tools, and data analytics to help teachers in lesson preparation, student progress reporting and follow up, and assessment of and for learning. It helps the teacher both to capture student grades, and bring focus to areas of weakness for interventions and improved learning outcomes. Kamkalima's customizable features enable teachers to add questions to assess student learning.

Preliminary surveys of Qatar Foundation (QF) school leaders and teachers revealed a lack of digital Arabic language teaching and learning resources compared to those for other curricular content. The need for digital resources became even more pertinent for QF schools with the onset of the COVID-19 pandemic, as the schools resorted to online and blended (hybrid) models of learning. Therefore, Kamkalima was selected for the 2021-222 WISE Edtech Testbed cycle to provide participating QF schools additional resources in Arabic language learning. It was deemed that Kamkalima's aim of reimagining and expanding how language learning is accessed could help raise student engagement with Arabic and provide additional tools and resources for the teachers to use in their classrooms.

Based on lessons learnt from the previous testbed cycle, Kamkalima was introduced to the schools and teachers in Fall 2021 (October – December 2021), when they had the opportunity to play around with the platform, and explore how Kamkalima's contents could be utilized and integrated into their classrooms for Spring 2022 (January – April 2022).



SCHOOL CONTEXT

3. SCHOOL CONTEXT

In the 2021-2022 school year, Kamkalima was implemented in Arabic classrooms of two Qatar Foundation schools for grades 5, 6, and 7. School A is a co-educational international school, and School B is a residential school for boys. The primary medium of instruction is English in both schools. Arabic classes are offered at two levels in both schools. Arabic Class "A" was offered at a more advanced level than Arabic Class "B" to accommodate learning needs of both native Arabic-speakers and Arabic as a second language learners.

Table 1. Participating school characteristics

	School A	School B
Number of participating teachers	4	2
Grade levels	years 5, 6, 7	year 7
Number of Arabic classrooms	5	2
Number of students registered on platform	144	26
School-specific program	Chair of Digital Learning	residential component for students

The biggest difference between School A and School B was in school-specific programmatic contexts that influenced the ways that either the teachers or students could have been influenced to use the edtech platform.

The “Chair of Digital Learning (CDL)” position was established and piloted in School A over the duration of the edtech testbed. One of teachers at School A was appointed to this new position. The CDL received additional training around edtech use and integration, and was tasked to advocate for teachers (individually, in teams, and in departments) to use various digital and technological learning tools and resources—including the testbed—to improve teaching and learning in the classrooms.

School B did not have such position. However, School B followed a more regimented style in lesson planning, in which teachers committed to putting the edtech platform into action at least once a week in their lessons. School B, a residential school, had a “homework club” where students were expected work on their assignments after school hours. This was a time identified by the school leadership when students would be able to receive additional learning support if they had difficulty accessing the edtech platform for their Arabic lessons.



INTRODUCING THE EDTECH PLATFORM (KAMKALIMA) IN SCHOOLS

4. INTRODUCING THE EDTECH PLATFORM (KAMKALIMA) IN SCHOOLS

The WISE Edtech Testbed and the selected edtech platform, Kamkalima, were initially introduced to the school administrators towards the end of the 2020-2021 school year. The schools were invited at this time to express interest in participating in the testbed for the following academic year; the two schools, A and B, expressed their desire to participate during the 2021-2022 cycle.

Surveys and interviews revealed great interest among school leaders in identifying and testing various edtech products that could facilitate the teaching and learning process. Specifically, school leaders expressed the desire for digital support to help reduce student learning gaps in literacy and mathematics. At the same time, however, the school leaders expressed concerns around introducing a new tool for the teachers, who had recently ended a disruptive period related to the COVID-19 pandemic. School leaders wanted to maintain a sense of consistency with the platforms they were using (or would be introducing). They believed that having teachers and students using different digital tools year after year, and spending additional time learning the new platforms, could be further disruptive for both. Some school leaders reported that teachers generally did not have enough training on the effective use of digital learning tools, and that some teachers thought that non-digital or traditional tools were more effective than digital learning tools.

Given these concerns, it was decided that Kamkalima would be introduced in the classrooms gradually, giving teachers sufficient time to explore the content of the platform and also receive professional development and training from the Kamkalima team. The participating school leaders and teachers were oriented to the edtech testbed cycle, and Kamkalima at the beginning of the school year in August, 2021. The participating teachers met with the Kamkalima team virtually on a regular basis; the teachers received a guided demo in parallel with other support from the Kamkalima team to help select content that would be most relevant and applicable to the learning goals of the teachers' lessons.

During this “testing period” (Fall term, 2021), student accounts were created so that the teachers could also introduce the platform to the students if they desired. Towards the end of the “testing period,” the teachers and school leaders asked if Kamkalima could prepare resource packages highlighting platform modules and content that would be most relevant and applicable to the learning objectives and targets according to grade level. The team prepared resource packs for the participating schools and teachers to use in the lesson planning process for the Spring 2022 term. The expectation was that Kamkalima would be used actively; it would be integrated into lesson plans for the Spring 2022 term, the “full implementation stage” of the edtech testbed cycle.



DATA

5. DATA

The goal of the edtech-school partnerships is to build effective implementation in the classrooms, innovative pedagogical practice, and improved student learning over the course of the testbed. To achieve this, we draw on data from platform engagement activity, classroom observation, teacher debrief session observation, and interviews with teachers, administrators, and members of Kamkalima team.

Over the course of the edtech testbed implementation period (January to April 2022), we found that the amount of Kamkalima usage varied across teachers and schools (see Table 2). It is worth noting that whereas teachers in School A were encouraged to utilize Kamkalima in their classrooms, there was no regimented schedule or directive for the teachers. By contrast, teachers in School B were directed to incorporate Kamkalima in their lesson planning in a more regimented manner than those in School A.

*Table 2. Teacher platform usage data summary**

School	Teacher	Grade level taught	Number of modules assigned
A	1	5, 6, 7	26
A	2	5	7
A	3	6, 7	9
A	4	5,6,7	5
B	1	7	10
B	2	7	10

*Teachers B1 and B2 shared lesson plans

FINDINGS

6. FINDINGS

6.1. Platform usage: Innovator of pedagogy or a simple substitute?

Classroom lesson observations in February, March, and April of 2022, found that Kamkalima was largely used as a reading resource. In both schools, the Kamkalima platform was used as a means to access chosen text for reading comprehension. Across classrooms in both schools A and B, teachers displayed the Kamkalima platform on the smartboard for the class, and used the display as a live text for collective "read-aloud" segments and/or annotations.

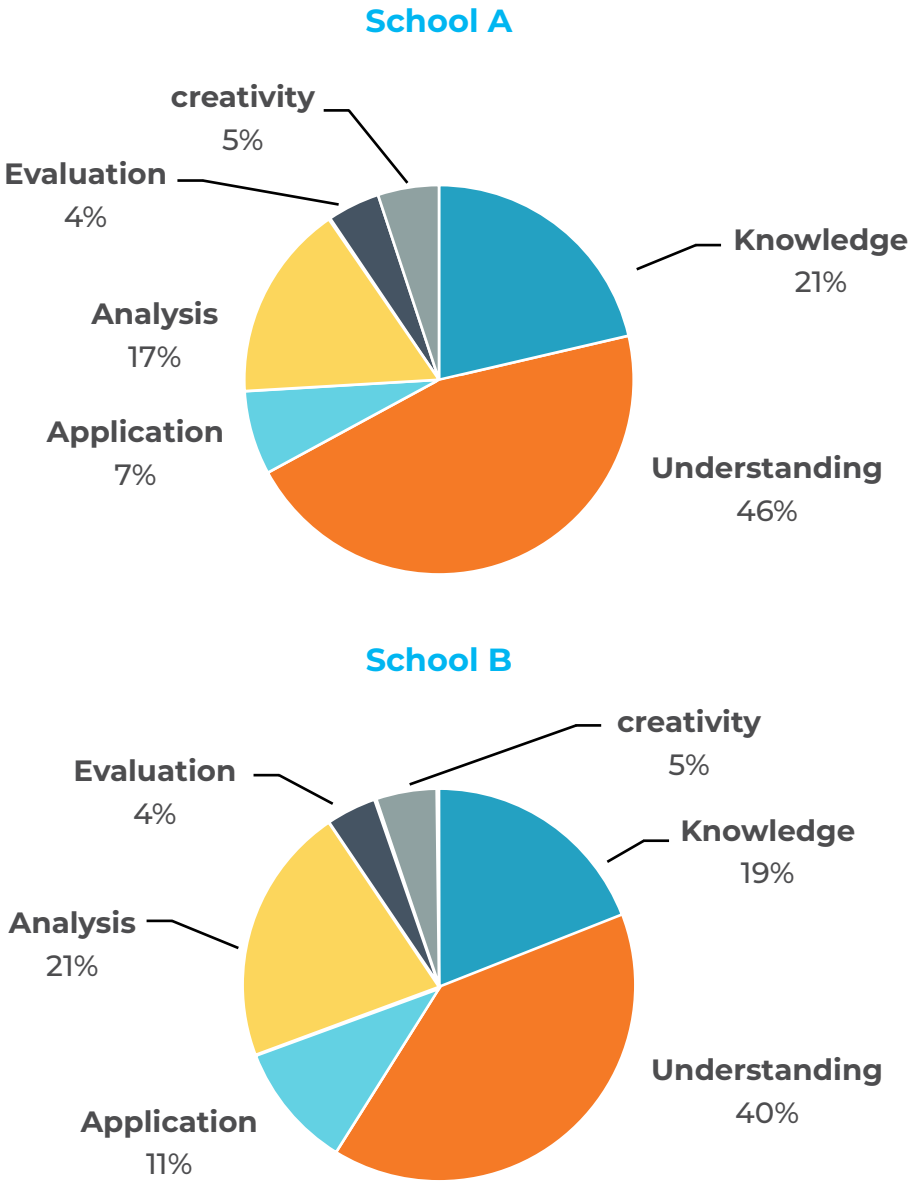
Over time, it was observed that teachers increasingly used Kamkalima for independent learning. Lesson observation indicated that stories (from the Kamkalima library) were read together as a class, and were also featured on individual student laptops, where students were asked to follow along, and later responded to comprehension questions for assessment. This was a change from early uses of the platform, when the reading text was displayed on the smartboard for collective reading. Students were now asked to read the text independently after the initial group exercise, and then respond to reading comprehension questions, which were sometimes differentiated by level.

Although Kamkalima offers reading comprehension, writing, and listening exercises on its online platform, the teachers mostly used it for reading comprehension. Some teachers used the platform to offer listening and writing exercises; these uses were limited, and were largely assigned as homework. It was observed over time that Kamkalima was used largely as a tool for homework, rather than in class learning and assessment.

Overall observation suggests that use of Kamkalima is limited at best, and that introduction of this digital learning tool did not significantly change teaching practice. In other words, no particular teacher actions distinguished Kamkalima from other resources that the teachers were using in delivering their lessons to students. The Kamkalima platform and its resources seem to substitute learning content that could have been delivered to students via textbook, workbook, worksheet, or any other written text found on the web or another digital library/repository.

Ideally, the teachers would utilize a combination of reading, listening, and writing exercises from the same Kamkalima unit/module to build concepts and language skills around a thematic area more holistically. Moreover, the Kamkalima tool could have been used to build students' executive function, higher order thinking, and toward sharing their understandings, either with each other, or via other related activities from the platform such as writing exercises. The teachers could have included questions and activities designed and built by Kamkalima to encourage higher-order thinking across Bloom's Taxonomy. However, this was not the case.

Figure 2. Distribution of assigned questions across Bloom's Taxonomy, by school (average)



Analysis of the types of questions the teachers assigned shows that teachers most often selected questions that require students to demonstrate "understanding," suggesting students had less opportunity to demonstrate higher-order thinking such as "application," "evaluation," or "creativity" while engaging with the Kamkalima platform (Figure 2). The findings indicate that teachers could have better utilized the platform's resources and tools to aid in the differentiation process. They could have further built student language skills beyond performing simple tasks, such as recalling for knowledge and understanding, to engage students in more cognitively challenging work such as evaluation and creativity. Teachers could have benefited from further professional development support to take full advantage of the range of question types on the platform designed to challenge students to progress through Bloom's Taxonomy, and accelerate learning.

What was notable from lesson observation during the Spring of 2022, despite limited use of Kamkalima in the classroom and the need for improvement, was that (1) student independent learning was encouraged through Kamkalima, and (2) teachers moved beyond employing Kamkalima for reading comprehension to assigning writing and listening lessons by April 2022, the end of the testbed cycle.

These changes in teacher behaviour were driven partly by the following factors: (1) a pre-testing period with an internal "champion" advocating for Kamkalima, and (2) continued support from the Kamkalima team.

6.2. Importance of a testing period with a "champion" within the school to advocate for the edtech product

An important lesson learnt from the pilot phase of the testbed was that sufficient time is needed to test the digital tool/platform in the school, beyond providing time for teachers to become familiar with the tool. More effort and time were needed to ensure that all technical issues were addressed (e.g., removing school firewall blocks to the platform and its visual contents) when loading the digital platform in the school network.

The Kamkalima team provided teachers an orientation to the edtech platform, with examples of how they could incorporate and utilize its various modules and resources for their lessons. The teachers were granted full access to the platform and

were encouraged to explore content, identify, and ideate ways to employ its resources in their teaching practice. In the beginning of the testbed cycle, teacher activity on the platform was minimal, as teachers prioritized other, more pressing needs. However, teacher engagement with the platform increased over time, especially as they began planning lessons for the Spring term with Kamkalima in mind. Later interviews with teachers and administrators revealed that the pre-testing period during the fall term was helpful in setting up teachers for actual use of Kamkalima with students in Spring 2022.

Furthermore, we found that having a "champion" within the school to advocate for the edtech platform and encourage its use was critical in encouraging teachers to incorporate and employ Kamkalima into their lesson planning and in-class teaching practice. The role of the "champion" was not an easy task; introducing a new edtech tool/ platform, engaging with it, and putting it to work always requires a shift in both mindset and behavior among teachers.

In School A, the Chair of Digital Learning (CDL) played the role of champion. In School B, a school leader (the Arabic department head) was the champion. The role of the two champions differed according to context and teacher perspectives. At School A, the CDL though a leadership role, was seen as a peer, championing a tool. In School B, the champion was a department head, and thus had a more supervisory relationship with the participating teachers.

Contrary to initial expectations, School A's CDL faced an uphill battle to encourage teachers to utilize Kamkalima actively in their practices. It was challenging for the teachers to learn and become comfortable with a new and unfamiliar edtech tool. Moreover, the teachers were transitioning from a remote/ blended learning environment to in-person classroom learning from the pandemic. Many were fatigued from their efforts to develop digital learning resources during the pandemic. It is no surprise that teacher use of Kamkalima, as observed in Table 2, varied widely among teachers. Teachers who liked the platform (e.g. Teacher A1) continued to use it and assigned multiple modules and tasks to the students, whereas those who did not, employed Kamkalima minimally. Nonetheless, in advocating for the testbed idea, the CDL was, to an extent, successful in coaxing teachers to use Kamkalima in their classrooms. A senior leader at School A noted,

The work of the CDL, combined with the testbed element, placed greater pressure on the teachers to use the platform [Kamkalima] more regularly than they were used to.

The CDL was able to encourage and place pressure on teachers to use Kamkalima at least once ("give it a try"). This may seem a modest achievement, but it was a win for the school and its senior leadership who opted to participate in the testbed for its potential. The CDL was able to exert influence on teachers to test a new edtech platform that could benefit them and their students. In short, the CDL was able to influence behavioral change.

This senior school leader from School A also noted that she observed a "turn" in the teachers and their engagement with Kamkalima when a stronger directive came from senior leadership about the importance of participation in the edtech testbed and that it was a great opportunity for teachers and their students. The directive led to greater teacher engagement with the platform; teachers started to see the value of Kamkalima, encouraging their engagement and utilization of the platform with their students.

This response made clear to School A's leadership that they should have given the CDL a more prominent leadership role to strongly reflect the school core support and commitment to the edtech testbed, and its leadership's desire to apply innovative edtech tools such as Kamkalima toward supporting improved teaching and learning.

Unlike School A, School B did not have a "Chair of Digital Learning" to serve as an advocate for introducing and applying new edtech tools. However, School B's culture had a more regimented, top-down management structure. Departmental leadership made decisions on plans, and teaching staff implemented the plan. The department head of School B was enthusiastic about participating in the edtech testbed, and wanted the grade 7 team to use Kamkalima in their lessons. School B's grade 7 Arabic teachers, therefore, incorporated Kamkalima in their lessons at least once a week. They attempted to utilize the platform's resources in creating in-class and homework assignments. This resulted in a more consistent use and incorporation of Kamkalima in School B.

Notwithstanding the differences in culture and approach of the two schools, the experiences in both revealed the importance of a champion, or advocate, in introducing the edtech product and encouraging its active use among the teachers. Of course, the schools' participation in the testbed, and a more stringent top-down directive in School B (and later in School A), did create conditions and extrinsic incentives for teachers to try the edtech product, and give it time to evaluate. The top-down efforts produced modest, initial effectiveness in encouraging engagement with the edtech platform. Beyond that, it was up to the individual teacher.

In School A, a range of engagement with Kamkalima was observed; some teachers resisted the new edtech tool/ platform, and others embraced it. This was reflected in quantity of their engagement and usage of the platform, measured by the number of modules/ lessons assigned to the students. Teacher 1 in School A (Table 2), who showed the highest usage, enjoyed not only the resources and content provided, but also a competitive element that the platform brought, as Kamkalima reports where a teacher's class and school is positioned, relative to all the other classes who are subscribed to the platform. This served as a motivator for Teacher A1 to further explore and engage with the platform and assign various tasks to improve their language skills, especially in reading comprehension by using Kamkalima's online library.

Again, this example shows how teacher engagement with the platform, beyond minimum expectations, varied based on teacher motivation. But it showed that initial and minimal engagement with the platform is largely driven by school leadership. Therefore, more active involvement of school leadership in introducing a new edtech product could be key to the introductory and testing phase of a new edtech product in the school. In such a phase, the senior leaders should make a case for the importance, of the new edtech, prominently feature its innovative use of technology, and provide time and support for teachers to fully explore the platform and its benefits.

6.3. The role of edtech venture as more than a supplier: Relationship building with the schools

A key prerequisite for edtech testbed success is to provide a supportive environment for all stakeholders to test and experiment with various edtech products, and apply effective solutions to unique classroom needs. Such coordination and collaboration among edtech ventures and educators is essential in building improved practice, and addressing the range of teaching and learning challenges. As the traditional saying goes: “It takes a village to raise a child.”

If such coordination and collaboration is inadequate or absent, gaps between a proposed or applied edtech solution, and the unique teaching and learning needs of a school, are more likely to emerge and widen. In such cases, the edtech testbed can play the role of broker or intermediary to bridge the gap between an edtech venture and a school, forming collaborative networks, and enabling and accelerating improved, innovative practices (Burt, 1992; Ahuja, 2000).

The WISE Edtech Testbed was well-positioned within the broader ecosystem to embed regular check-ins into the testbed cycle among Kamkalima, the schools, and the WISE team. These sessions were critical for strengthening relationships and trust between the edtech provider and users (teachers). They allowed teachers to voice concerns, provide real-time feedback on what worked well, make suggestions to improve the platform, and to ask the Kamkalima team for suggestions and recommendations. Educator comments were invaluable for the Kamkalima team, opening paths for them to provide teachers further support and resources tailored to their needs.

As a result of these sessions, teachers received resource packages tailored to Qatar’s national curriculum and the International Baccalaureate (IB) curricular standards. The Kamkalima team recognized the value of the additional material, and continued to provide schools with monthly resource packages throughout the testbed cycle, and ongoing support.

6.4. Benefit of participation for the edtech venture: Real-time feedback

Edtech ventures themselves benefited from participation and engagement with the testbed. As mentioned, the testbed facilitates relationships with participating schools and teachers on behalf of the edtech ventures. The testbed goes beyond typical service provider-client/customer relations, by seeking to build collaborative relationships between the edtech venture, and participating schools and teachers.

The monthly debrief sessions allowed Kamkalima team to hear first-hand accounts of teachers who were exploring and utilizing the product in real-time, allowing the team to hear where the pain points were. The Kamkalima team found that teachers in both schools were using the platform mostly as a reading resource, and that this was similar –or not very different-- from other schools in their first year of using the product. The team received further constructive feedback from the participating teachers that was similar to what they heard from teachers in other schools. This included needing simplified or abridged texts for lower-level students, having student voice text recording, and the desire for collaborative learning spaces.

The feedback received from the testbed experience validated both the existing product and further measures for improvement the Kamkalima team anticipated for their product. For example, the team articulated how the feedback sessions with the schools validated their plans to simplify the current text and provide abridged versions for Arabic language learners. It also gave them ideas to build a brainstorming tool and provide student voice recordings for students to follow along as they read the text.

Moreover, the iterative debrief process with schools also provided Kamkalima an opportunity to test their professional development and training modules offered to subscribed schools. This opportunity allowed Kamkalima to consider what customer success could look like, helped them design the follow up process for their customers, and how they can better explain the main aspects of the platform to provide more practical examples and applications to the teachers' needs and curricular, school context.

OPPORTUNITIES AND LIMITATIONS OF EDTECH IN THE CLASSROOM

7. Opportunities and limitations of edtech in the classroom

Although classroom use of Kamkalima was limited, and did not significantly alter teaching practice, Kamkalima provided resources and tools to enable differentiation and encourage student independent learning. This outcome, witnessed during the cycle, suggested a promising opportunity for how edtech tools, such as Kamkalima, might further support students. While an edtech tool alone cannot substitute for in-person instruction, findings revealed that edtech can be an effective means for scaffolding and differentiation, allowing teachers to meet a range of student learning needs. As one teacher noted,

> *Kamkalima allowed for personalized instruction based on students' skill levels. I created two groups to allow for differentiation on the platform. I have been differentiating reading questions for high achieving [and] low achieving students by taking advance of the customization features. I assign more analysis questions to the high achieving students, and recall, quick response questions for the low achieving students. Right now, the higher and lower-level students are together in one class, so the platform has been good to differentiate and allow for more personalized instruction.*

Kamkalima's customizable features and ability to assign a variety of questions and tasks provide a simple way for teachers to differentiate instruction and provide more individualized learning to students in a mixed-level class. Kamkalima further provides a curatorial process of data analytics to track student progress, and compare student outcomes with the school average and user average benchmarks. Interviews and observations revealed, however, that data and analytical tools were largely underutilized by teachers and school administrators.

In School B, the student data from the platform was provided to the residential boarding team to create intervention plans to support struggling students during homework club. Summary data and analytics that could be used to view each assignment and track student progress were not actively used by the teachers. The teachers' lack of sufficient training to determine what these trends are, how the trends from the dashboard related to and complemented other assessments of student progress and performance, explained

their limited (or lack) of active use of data. No significant use of dashboard data analytics by School A was reported.

Observations, both in classroom and on the platform, revealed that Kamkalima was mostly used for scaffolding and differentiated instruction. This is a core benefit and an opportunity for edtech platforms like Kamkalima. Such digital tools can provide additional teaching and learning resources for teachers and students, and reduce prep time for teachers who may need to develop further materials to scaffold and differentiate learning. Moreover, although Kamkalima was not widely used during this cycle of the testbed, teachers did use it to assign homework and to provide space for student independent learning. This confirms that tools such as Kamkalima can provide valuable supplemental learning materials for students who are more advanced and need additional materials. The teacher can determine the number of assignments students are tasked with according to student level, and suggest further content for students who need more materials.

Furthermore, encouragement of independent learning through Kamkalima can help students at various stages and levels of language learning to work at their own pace, taking more time to do the readings or re-read texts if needed. This could allow for more individualized learning for students, help accelerate language learning and improve student efficacy and self-determination (Hiemstra, 1990; Skehan, 1991; Danneker & Bottge, 2009; Li & Lu, 2012).

Some teachers found the generic nature of edtech platforms, such as Kamkalima, to be problematic as they are intended for use by a variety of schools, districts, and countries. Teachers looking for assignments that directly align with the curricular standards and learning objectives of their specific country or district, may identify this generic nature as a limitation. Although Kamkalima's modules are developed with various national standards for Arabic language in mind, they are not necessarily sorted by learning objectives. This was one of the drivers for the Kamkalima team to provide resource packages that included curated, recommended modules for the two schools. Creating resource packs for every school/district client may not be feasible for Kamkalima at scale. However, adding sort features based on generic, common learning objectives could be a helpful feature to increase teacher engagement and use.

LESSONS LEARNED AND RECOMMENDATIONS

8. LESSONS LEARNED AND RECOMMENDATIONS

Reflecting on the experience and findings of the 2021-2022 WISE Edtech Testbed cycle, we note at least four key recommendations for more effective implementation of the testbed, and for improving the constructive partnership among the edtech venture, schools, and the testbed.

8.1. Recommendation: Involve the edtech venture in professional development and teacher training

Relationship building between the edtech venture and the schools and teachers was an integral part of the edtech testbed. As discussed previously, teachers found engaging with Kamkalima staff for professional development, including the reflective sessions, especially valuable. The interactions allowed teachers to troubleshoot, witness demonstrations of effective platform use, and resulted in the development of tailored teacher resource packages. These resources and sessions were a critical boost for teacher engagement, testing, and to student use of the platform. Frequent, intentional interaction benefited both teachers and the edtech venture itself by allowing Kamkalima to validate its product and envision its future directions.

The Kamkalima team led trainings and demos, encouraging teachers to test and implement the product in their classes, and receive feedback. The testbed facilitated this relationship building between the venture and the teachers. The resulting feedback loop benefitted all stakeholders, and supported the edtech venture's ongoing product development.

8.2. Recommendation: Provide practical examples and models for incorporating the edtech tool into lesson planning and delivery.

Studies found that lack of professional knowledge, among teachers, of digital technology, design thinking, and how these relate to everyday pedagogy poses a significant challenge in introducing technology as a design tool in schools (Smith et al. 2016, Eriksson et al. 2018). As noted throughout this report, we found that providing specific resource packages and demonstrations of how to use and incorporate the edtech platform into teaching practice was a key to improving teacher engagement and use. Post-participation, year-end reflection interviews with teachers and

school leaders revealed that more concrete, specific examples for effectively incorporating the edtech platform into lessons, and ways to engage students through the product would have been helpful. They indicated that such further pedagogical tools, training, and modeling could have further encouraged and improved both teacher and student use of product.

8.3. Recommendation: Provide additional training and support on effective use of data, generated by the edtech platform, for continued assessment of student learning.

As noted, this testbed cycle revealed that teachers and administrators rarely took advantage of the dashboard data analytics provided by Kamkalima. This may be partly explained by the platform's lack of integration with the wider learning management systems (LMS), used by the teachers. A greater impediment was likely the lack of training and support on leveraging data analytics to inform teaching practice. Further training, development and support from administrators could improve data-informed teaching practice, including creating individualized support and group differentiation plans.

8.4. Recommendation: Identify a "digital innovator" or "edtech champion" to help drive and motivate teachers to try out the edtech product in coordination with school leadership.

Appointing a "champion teacher" to advocate for effective use of the edtech product, think/ideate with participating teachers to address challenges --especially those around student access and student digital literacy-- could help sustain energy and enthusiasm. This can extend engagement with the edtech and increase the likelihood that exploring more deeply will produce favorable assessments and outcomes. This advocate among peers can help create a culture of reflection, iteration, and innovation among teachers. Testbed success largely relies on teacher willingness to engage with the edtech in their practice. Collaborative co-creating with edtech partners in the testbed contributes to improvements in the venture. As shown, the "Chair of Digital Learning" position had a positive impact in encouraging and motivating teachers to explore and apply edtech tools in varied and innovative pedagogies.

Some teachers, on their own initiative, actively seek out digital learning tools to engage students. Schools can support such teachers by creating a leadership role like the CDL in School A. The leader in this role could encourage teachers to diversify and add to their portfolio though further professional development. Sufficient active support and endorsement from senior school leadership would be essential to the effectiveness of the new leader. Raising the profile of the CDL as a leading digital innovator can spark renewed excitement within the faculty for integrating edtech tools and more varied, innovative pedagogy, toward improved student engagement and outcomes.



CONCLUSION

9. CONCLUSION

This report sought answers to the following questions: (1) How can edtech venture-school partnerships be effectively built to foster supportive environments for testing and using edtech products for innovative practice in the classroom? and (2) How can larger transformations within pedagogy and learning take place through edtech use?

Findings from this year's edtech testbed revealed that edtech platforms such as an e-Learning platform can prove to be a valuable teaching and learning resource. They can support teachers in scaffolding and differentiating learning for students across the language learning spectrum. We found that fostering relationships beyond the conventional, contractual service provider and client model was critical to increasing teacher and student engagement with the edtech platform. Involving the edtech venture in the training and development process for schools and their teachers was important for building a truly collaborative environment between the edtech ventures and the schools. In the resulting feedback loop, teachers received guidance, resources, and support to better apply the learning platform, whilst the edtech ventures received invaluable real-time feedback on their product.

Consistent with lessons from the pilot phase, we found that the presence in the school of a "champion," or active advocate, for the edtech product would be an important galvanizing force. With strong support and empowerment by school leadership, the champion teacher can successfully encourage teachers to test and explore tech tools, engage students in new and varied ways, and transform teaching practice. As noted earlier, however, without adequate support from leadership, the champion teacher may not be effective.

From IT and data protocols, to the incentivization behind professional learning, and to system level policies, developing an edtech testbed cannot be approached through a single lens. Rather, it should be considered an effort that involves the entire learning ecosystem. Our experiences and lessons from the 2021-2022 cycle of the WISE Edtech Testbed revealed that building strong relationships

and collaborative partnerships is key to implementing effective, innovative teaching practice for improved student engagement and learning. We found that all stakeholders, including the testbed, edtech ventures, and the partner schools leaders and teachers, together play crucial roles in approaching and achieving these common goals.

In future iterations of the WISE Edtech Testbed, WISE will give more attention to relationship building, and facilitate greater opportunities of interaction through professional development and group debriefing sessions. We believe this would allow the testbed to provide a learning laboratory and incubator for the integration of tech-enabled education solutions toward innovative practice, and foster a supportive ecosystem for what matters most in education: teaching and learning.



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ABOUT THE AUTHORS

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Seungah S. Lee is a visiting senior lecturer at New York University Abu Dhabi, and a research fellow at WISE. Her research broadly explores how nation-states, especially Arab Gulf states, negotiate changing demands of a globalized world and adapt global models around youth development, education, entrepreneurship, and innovation to their respective local contexts. She holds a Ph.D. in International Comparative Education and Organizational Studies from Stanford University.

Victoria Basma is a former education consultant and teacher; she holds a degree in Social Policy and Development from the London School of Economics. Currently, as policy development officer at WISE, Victoria is responsible for managing the edtech track, including working with entrepreneurs to create a positive impact in education.

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