Chapter 5. INDONESIA

Sekolah Enuma, A digital application for young learners

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ABSTRACT

Enuma School is a digital application that aims to support young children's learning of basic literacies: reading, writing and mathematics, as well as additional language learning. It functions without internet access, promotes individualized learning, and is designed for self-directed learning too. Enuma School was first created for use in Indonesia as Sekolah Enuma Indonesia. It supported 586 children in Lampung and Medan to continue learning in early 2021, during the COVID-19 pandemic. Since mid-2021, it has been rolled out to an additional 2,000 learners through 47 kindergartens and primary schools across Java, as education systems continue to navigate intermittent school closures and attempt to build back better. This case study describes Sekolah Enuma Indonesia and reviews the experience of its use in Lampung and Medan.

KEYWORDS

Independent learning, individualized learning, digital skills, literacy.

BIG IDEAS

This case study shows that a well-developed digital application such as Sekolah Enuma can support children's individualized and independent learning, which assists resource-constrained environments in meeting basic learning needs more equitably, while supporting the adoption of digital skills. This may be beneficial to communities facing skilled teacher shortages, or low access to education due to health crises or other barriers. Its ability to work without connectivity prevents the programme contributing to the growing digital divide

WHAT IS ENUMA SCHOOL?

With content covering early childhood education through to Grade 2 (appropriate for 4 to 9 year olds), the Enuma School digital application, developed by Enuma, Inc, a leader in developing digital early-learning solutions, offers hundreds of activities: games, books

and videos that support young children to learn literacy, mathematics and English as an additional language. The activities are organized into learning paths that follow a tightly scaffolded curriculum, with placement tests, check-ins and review units that provide children with additional support when needed or help children jump to more challenging content when appropriate. This allows the application to individualize learning for each student, with the aim of better meeting their educational needs.

In addition to enabling individualized learning, Enuma School is also an independent learning tool that children can, for the most part, use themselves without requiring constant adult direction and support. The application is designed in a thoughtful child-focused and child-friendly way, drawing on the principles of the Universal Design for Learning (UDL) framework 'to improve and optimize teaching and learning for all people based on scientific insights into how humans learn' (CAST, n.d.). It aims to ensure that all learners, including those with special learning needs, are confident and empowered when using Enuma School. Allowing children to learn independently is not only beneficial in terms of developing a love of learning, but also helps address operational challenges where there is a shortage of qualified teachers to support children's learning, whether generally or in a specific subject.

Enuma School can be accessed on a mobile phone or a tablet device. Once installed, the application does not require internet access to function. However, when there is internet access, data can be synchronized with the Enuma School Learning Management System (LMS) so educators can track programme and learning progress. The ability to function without the internet makes Enuma School particularly useful in low-resourced areas, which often have low-connectivity.

SEKOLAH ENUMA INDONESIA

Prior to the COVID-19 pandemic, Enuma was continuing its efforts to develop applications that young children could use independently in literacy and numeracy learning. In 2019, its Kikit™ School application was co-winner of the Global Learning XPRIZE competition. In a 15-month randomized control trial conducted in Tanzania, Kitkit School was found to have produced the highest learning gains for children's basic literacy and numeracy in Swahili, involving those in rural and low-resourced communities and including children who were out of school or previously illiterate (XPRIZE, 2019).

In 2020, The HEAD Foundation, PT Gunung Madu Plantations (GMP) and PT Pemukasakti Manisindah (PSMI) provided a grant to Enuma to further develop Kitkit School for use in Indonesia: Sekolah Enuma Indonesia. GMP and PSMI communities were keen to have a tool to support children's learning in mathematics and English, in particular, as they faced a

shortage of qualified teachers for those subjects. The HEAD Foundation was also concerned with the lack of quality learning resources and teachers in the region.

As the grant was being finalized, the COVID-19 pandemic made the development of a tool to support young children's ability to learn continuously more urgent, as communities navigated school closures. A particular gap was for young children, as most online and digital learning opportunities were geared towards older students and Zoom classes for young children often required more supervision and support, as well as connectivity. An independent tool for young children would be particularly helpful.

With support from The HEAD Foundation, GMP and PSMI, and leveraging its experience in developing applications to help children learn in more than 20 countries, including through Kitkit School, Enuma completed development of Sekolah Enuma Indonesia in December 2020. By January 2021, the application was being used by 586 children in Indonesia: 130 kindergarten to Grade 3 children from the Deli Serdang community, Medan, Indonesia, and 456 children in Grade 1 and Grade 2 from three schools located in plantation communities in Lampung, Indonesia.

In Medan, the initiative was implemented as an extracurricular programme organized by Yayasan Fondasi Hidup (Food for the Hungry, Indonesia), where groups of between seven and 16 children would gather at community sites for 60–90 minutes five days a week to play with Sekolah Enuma. Children had been out of school for over nine months at the time of implementation and had little access to other learning opportunities. Each child played, on average, 41 hours of Sekolah Enuma over a three-month period.

In Lampung, while the programme was initially to be implemented as a 30-minute class during school hours in three schools, COVID-19 related school closures meant that the programme was implemented in hour-long sessions in community halls and as an at-home programme during a more severe community shutdown. Each child in Lampung played an average of 38 hours of Sekolah Enuma over three months.

A rotating schedule of group sessions in both Medan and Lampung allowed devices to be shared by multiple children, with one child playing with one device in each session. Facilitators and teachers helped support children when they gathered at community sites to play with Sekolah Enuma, or to distribute devices for the at-home programme, for which children took a device home and could access the application anytime their families allowed.

OBSERVATIONS

Exhibiting learning efficacy

Students took pre- and post-tests during the three-month beta-testing period. The tests, part of Sekolah Enuma, were administered digitally through the application. The Indonesian and mathematics tests were developed based on the Early Grade Reading Assessment (EGRA) and Early Grade Math Assessment (EGMA), while the English test was developed based on Sekolah Enuma's English curriculum. In both Lampung and Medan, average post-test scores increased from pre-test scores. The average percentage of correct answers for Lampung students increased from 73 per cent to 78 per cent in literacy, 53 per cent to 59 per cent in mathematics, and 44 per cent to 55 per cent in English. In Medan, the average increased from 47 per cent to 53 per cent in literacy, 41 per cent to 53 per cent in mathematics, and 25 per cent to 29 per cent in English[2]. While future opportunities for more rigorous evaluation of learning results, such as through a randomized controlled trial (RCT), would be beneficial, these initial results are an encouraging testimony to the programme's learning efficacy.

Raising empowered learners

Thoughtful design considerations created a child-directed application, which learners are able to use without much, if any, intervention from facilitators during play. By applying Universal Design for Learning principles to its design, children are given multiple ways of approaching or understanding the learning content; for example, through auditory and visual cues, as well as through a tightly scaffolded curriculum that allows children to move along an appropriate learning pathway at a pace that suits them[3]. When interviewed about the project, Nanik Ernawati, the head teacher of three GMP schools involved in the programme noted, 'The Sekolah Enuma programme has succeeded in helping reduce children's boredom ... The children can be independent and identify problems without guidance' (Enuma, 2021a). The application provides little direct instruction, and instead relies on quality game design to craft a learning experience that children explore independently. Through positive feedback and ongoing encouragement from the games and the learning system, Enuma School aims to empower children to be confident and independent learners.

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2. *Tests include timed sections that observe how many questions children can answer within a period of time. Thus, it is not realistically expected that children would attain 100% in correct answers on the tests.*

3. *For more information about Enuma's game design, please refer to the Kitkit School, Learning, Design & Curricular Framework: Available here*

Supporting innovative learning models

Stakeholders note the flexibility of the programme in supporting learning for children regardless of their grade level or location. Children in both Medan and Lampung were able to participate in the programme at scheduled times irrespective of their grade or learning level, resulting in mixed learning groups. The programme has been implemented at community centres (akin to school settings), extra-curricular environments, and in homes. 'Enuma's model is suitable for various learning environments. Therefore, we believe that this model can be applied on a larger scale and used by children from various contexts and regions in Indonesia', said Lim Poh Ching, Operation Director, PT Gunung Madu Plantation (Enuma, 2021a). Future visions of education may require such flexibility, whether instigated by natural or human-made circumstances, but ultimately needing expanded ways of thinking about where and how children can formally learn.

Increasing equity

'During the pandemic, we are increasingly seeing the importance of having access to good digital-based education. Once installed, Sekolah Enuma can be played without an internet connection. So, the children can still learn, even in areas where it is hard to obtain an internet connection. That is why we firmly believe that the Sekolah Enuma model is a good and creative approach and can make a good breakthrough for children's education in Indonesia,' commented Effendy Aritonang, National Director, Yayasan Fondasi Hidup (Enuma, 2021a).

Reliance on online digital programmes during school closures has contributed to increasing inequity during the pandemic. In addition to a barrier to accessing devices, both globally and locally, divisions have widened between those with access to stable connectivity as well as those with access to the requisite hardware and devices. With access to more affordable devices increasing globally, and governments and industry increasingly committed to improving connectivity, the hope is that these challenges will dissipate. The Sekolah Enuma programme so far has benefited from donor support to purchase devices and aims to overcome one barrier by not requiring a stable internet connection to function. This ability to reduce inequities while promoting access to education and digital education has helped galvanize support for the programme from a collaboration between Lazismu, Muhammadiyah and 'Asyiyah, who will be using the Sekolah Enuma programme in Java. 'Our concern as a philanthropic organization is how teachers and students from remotes areas and isolated regions can benefit from the new technology of learning without being burdened by, among other things, the internet connection,' said Professor Hilman Latief, Chair of Lazismu (Vachatimanont, 2021).

Digital skills for young children

In addition to its offline capabilities, Professor Hilman Latief also highlighted the application's potential for supporting digital skills. 'We do hope that our collaborative programme, called EduTabMu and Sekolah Enuma, can enrich teachers' learning perspectives and methods, as well as accelerate students' engagement in new technology and interactive learning processes in such subjects as mathematics, English, and the cultural diversity of Indonesia. This collaboration is a strategic step to familiarize digital technology for our generation and promote what I would call an "inclusive learning acceleration project,"' (Vachatimanont, 2021).

With content appropriate for young learners, the digital programme also provides an opportunity to expose children to digital programmes at an early age. It teaches them how to tap, drag and trace on a touchscreen surface, and how to use a calculator, and provides an opportunity for them to navigate a digital programme independently and confidently. 'Today's children are digital natives. Enuma School not only teaches basic mathematics, Bahasa Indonesia and English, but also digital literacy,' observed Chrisman Bintaro, Regional Team Leader, North Sumatra, Yayasan Fondasi Hidup (Enuma, 2021a).

LOOKING TO THE FUTURE

Following Lampung and Medan, improvements were made to the Sekolah Enuma Indonesia application. The project is scaling up, with plans for more than 2,000 students from kindergarten to Grade 2 across Java to use the programme. This and future projects will provide more opportunity to test and showcase the impact of using the programme with more communities, schools and students.

In Indonesia, Enuma is working with partners to secure more funding and further implement the programme, as well as to conduct more research. Globally, it hopes to have the opportunity to develop Enuma School into more languages, so that it can be available to children in other countries. To do so, funds and support need to be available for localization into local languages and ongoing adoption. This is particularly important for localization, to ensure further divides are not created by making content available only in a few globally dominant languages. Aside from increasing the availability of programmes in relevant local languages, educators and education systems could be increasingly supported to integrate digital learning, particularly independent learning tools, into their systems.

A child-directed application can support basic education and digital literacy and help build confident and empowered learners to engage further in twenty-first century learning. An offline and application-based programme such as Sekolah Enuma can also integrate flexibly

into new learning environments or models, as schools of the future continue to evolve to improve or as they face various challenges to educational delivery. As Dr Ella Yulaelawati, Curriculum Developer and Advisor to Sekolah Enuma Indonesia and former Director, Ministry of Education and Culture (2006–2018) noted with regards to Sekolah Enuma: 'I hope that all Indonesian children are capable of reaching their full potential when given the proper digital technologies and learning experiences towards building twenty-first century lifelong learners' (Enuma, 2021b).

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