LEAP Final Deliverable(s)

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Executive Summary

Introduction

Little Thinking Minds (LTM) is an edtech company with two core digital products for Arabic language learning for native speakers and Arabic language learners. LTM sells its software to 700+ schools in the MENA region and is seeking to grow its user base and scale its impact beyond the 450,000+ students it touches now. Through this LEAP project, LTM sought to:

- Bring more scientific evidence into its product and demonstrate student learning outcomes
- Understand areas of improvement for user retention

Organization's role & strength

The organization is mission-driven and is attempting to make Arabic language learning engaging through a gamified platform with some traction across several major Arabic-speaking territories. There are ambitious growth plans to enter new regions (like Iraq) and even reach out to countries where Arabic is learned primarily for religious reasons. But the organization understands that this is a competitive market with many similar public and private sector initiatives. It is quite difficult to make learning Arabic engaging and interesting given it is often not central to long-term success in educational curricula across the MENA region. LTM also realizes that to stay on a trajectory of growth with potential for additional funding, it needs to understand how learning outcomes are measured, whether its approach is consistent with the latest in learning (especially reading) science and engineering and whether it is adopting the best approaches to measuring and improving retention, the user interface and gamification.

Needs summary

We can separate the organization's needs in three areas:

- Scientific evidence / Learning outcomes
- User engagement and retention
- Relaying the integration of more scientific rigor in its messaging

Scientific evidence / Learning outcomes

The LEAP team focused on educating the organization on the "Science of Reading" (SoR) and the potential avenues to design and modify the product based on scientific evidence on how individuals learn to read and how we should teach reading. For instance, LTM products utilize leveled readers, an approach that is centered around assigning primarily those books to children that best match their current reading level. While this sounds like a reasonable approach, the LEAP team advises that LTM understand the limitations of a product utilizing leveled readers based on current research.

User engagement and retention

LTM expressed interest in the LEAP team identifying best practices around retention, user-interface design and gamification to drive engagement. This input was being given in the

spirit of some specific feedback as well as general frameworks for experimentation and assessment that LTM can follow in the future.

Solution summary & next steps

Ultimately, we have identified three key recommendations:

1) An overview of SoR and how it is relevant to the context of LTM with a view of explaining to them how evidence-based learning outcomes can be measured and which aspects they should be aware of in thinking about their own learning outcomes.

2) An overview of the game design providing precise feedback on user design, engagement and retention strategies. This includes feedback from people with specialized knowledge in these domains and references to comparable successful products. The purpose of this overview is to provide a framework in which LTM can plan future experiments and approaches to gamification and enhanced user engagement.

3) Review LTM marketing and fundraising materials to integrate messaging around using the SOR or other evidence-based approaches in the curriculum.

How we understood LTM's state of the world

Cultural Context
Arabic is an essential language for the MENA region; however it is a complex language to learn to read, write and speak. There are many dialects of the spoken language, and they do not necessarily align with the written language. Furthermore, due to globalization and social media influences, children and adolescents often lack motivation to embrace their language heritage and are hesitant to learn or maintain their Arabic language skills. LTM was designed to help bridge this gap and keep this important cultural aspect alive in Arab-speaking countries.

Project Scope
LTM has two core software products: "I Read Arabic", built for native Arabic speakers, and "I Start Arabic", built for new learners. For the purpose of this project, we primarily focused on the "I Read Arabic" product though feedback relevant to "I Start Arabic" is also provided.

Business Overview
LTM has had great success in the MENA region, reaching 700+ schools in 10 countries. LTM sells its software products to schools with its main buyer as school administrators. LTM has ambitions to grow its customer base across MENA, via a mix of government contracts and private/public school contracts.

LTM operates in varying environments:

- Private schools: where students primarily speak and learn in English, and Arabic is a mandatory course within schools from kindergarten onwards
- Public schools: where students primarily speak Arabic

The motivation for students to learn Arabic is also mixed. Students across the region are faring poorly on standardized tests in Arabic, and governments feel the pressure to improve Arabic language outcomes for work and cultural reasons. Often, students are motivated by extrinsic factors (i.e., competitions, pressure from teachers, awards, certificates, recognition) vs. intrinsic reasons.

Product Overview
Currently, the I Read Arabic product touches two core user groups: 1) Students, ages 5-15 and 2) Teachers, median ages 30-55. As a B2B2C product, LTM must think about engaging students and teachers in a harmonious way. When teachers are engaged with the product, students tend to use it more. Similarly, having students engage with the product will support teacher engagement.

Two main challenges exist amongst users: activation and stickiness. Students who activate on

the platform tend to stay with the product; however 48% of users do not log in monthly. Student usage is driven by teacher engagement, and there is no formal product onboarding to help school administrators encourage teachers to use the product. With this, many schools are left to decide product value based on teacher engagement even if the student outcomes are clear.

Evidence and Outcomes

LTM must strike the balance between building an effective and engaging product, and relying on evidence-based approaches grounded in the Science of Reading to develop the product and to demonstrate user outcomes (in students, educators, and administrators). In our conversations with LTM, we synthesized that several aspects of the product were not designed and developed based on current scientific evidence and further lacking a development strategy grounded in the Science of Reading. Furthermore, no scientific consultant was employed in order to develop key features of the product, especially in regards to Science of Reading informed practices.

Limitations

Given the condensed time frame of this project, the LEAP team was not able to do a full analysis on both the product and the curriculum/evidence-based approach. We have put forward recommendations based on our limited discussions with the hopes to advance LTM's education on these topics and provide guidance on how to build out internal capabilities to continue this analysis.

We are also very mindful that we do not have a full grasp of the important cultural context in which LTM and its users, buyers and investors operate.

Recommendation 1: Align LTM with the Science of Reading (SoR)

In several conversations during the LEAP Sprint, the importance of considering how research on reading and its developmental trajectory can influence the development of ed-tech products such as LTM was discussed. It was emphasized that there are many international efforts to ensure that reading instruction and technology designed to enhance reading instruction is aligned with what is known about how children develop literacy skills (e.g.; for resources see Ontario Right to Read Report, The Reading league, National Center for Improving Literacy).

In the following, we provide a high-level overview of the "Science of Reading" (SoR) and discuss the implications of this body of research for the design of ed-tech products, such as those created by LTM, whose aim is to facilitate children's development of literacy skills. We will then discuss whether leveled readers, such as the approach LTM employs, are aligned with the SoR and discuss other approaches which may offer options to LTM to further develop and align their product to the SoR.

What is the Science of Reading?

The Science of Reading refers to the large body of empirical evidence on how children learn to read from an early age onwards. The Science of Reading encompasses evidence from cognitive psychology, developmental psychology, educational psychology, psycholinguistics as well as cognitive neuroscience. The SoR refers to a broad, multidisciplinary body of scientific studies that cover language, reading, and writing development and its key components. These federally and privately-funded research studies have been conducted globally over the last 50+ years in various languages.

Through this research, a substantial amount of evidence has accumulated to guide our understanding of how reading and writing skills develop for proficient readers, the reasons why some individuals may experience difficulty, and the most effective approaches for assessment, teaching, and intervention to enhance student outcomes by preventing and addressing reading difficulties. Very important implications and theoretical and practice-informing models have been synthesized from the body of the SoR. For instance, the Science of Reading emphasizes that unlike most aspects of spoken language, reading needs to be explicitly taught. Put differently, while the majority of children are able to develop most oral language skills without
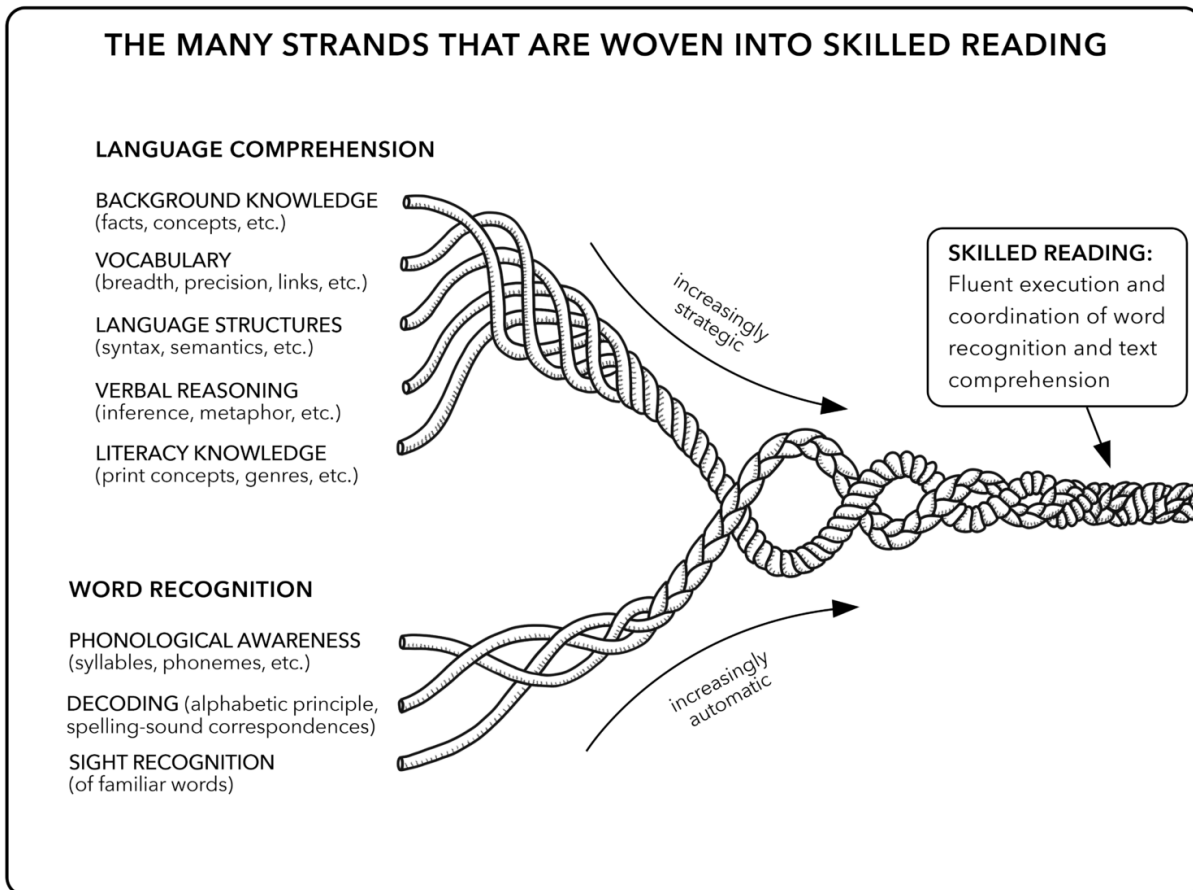
instruction, reading skills do not develop naturally and require prolonged, explicit and systematic instruction.

One aspect that has been derived from the body of knowledge of the SoR is the so-called '*Simple View of Reading (SVR)*' (Gough & Tunmer, 1986). The SVR posits that RC (Reading Comprehension) is the product of two essential components, word recognition (WR) and oral language comprehension (LC), often depicted as the formula RC = WR x LC (Refs). Breaking down these two essential components and its underlying key processes we can simplify that WR can be defined as the capacity to accurately decode and recognize written single words . On the other hand, language comprehension refers to the ability to be able to derive (literal and inferred) meaning from various levels of linguistic discourse represented in speech.

For instance, the level of language comprehension exhibited by a child is influenced by their vocabulary development, their background knowledge (e.g. if a book is about Ancient Egypt then readers who have existing knowledge about Ancient Egypt will be able to extract more meaning from text than readers who lack such background knowledge) and syntactic knowledge. Numerous research studies have shown that this theoretical model can explain a large amount of variance in reading comprehension (the ability to to derive and construct meaning from written text) for elementary- and middle-school-aged children across several orthographies.

However, increasing evidence has challenged the simplicity of this framework. Specifically, it has been shown that both WR and LC skills require complex cognitive and linguistic processes including phonological and morphological awareness, as well as orthographic symbol knowledge for word recognition. Furthermore, it has been shown that LC requires several language and cognitive component skills such as vocabulary, executive functioning, or working memory.

The notion that the development of reading comprehension is the *product* of word recognition and language comprehension is nicely illustrated by Scarborough's *Reading Rope* (2001):

THE MANY STRANDS THAT ARE WOVEN INTO SKILLED READING

LANGUAGE COMPREHENSION

BACKGROUND KNOWLEDGE
(facts, concepts, etc.)

VOCABULARY
(breadth, precision, links, etc.)

LANGUAGE STRUCTURES
(syntax, semantics, etc.)

VERBAL REASONING
(inference, metaphor, etc.)

LITERACY KNOWLEDGE
(print concepts, genres, etc.)

increasingly strategic

SKILLED READING:
Fluent execution and coordination of word recognition and text comprehension

WORD RECOGNITION

PHONOLOGICAL AWARENESS
(syllables, phonemes, etc.)

DECODING (alphabetic principle, spelling-sound correspondences)

SIGHT RECOGNITION
(of familiar words)

increasingly automatic

The SVR emphasizes the importance of word recognition as one of two important strands of successful development of reading comprehension and a large body of research in the Science of Reading has demonstrated that decoding is the key building block of literacy development but that oral language skills are equally important (Castles, Rastle & Nation, 2018) and should both be considered when designing products that aim to enhance reading comprehension. Approaches that emphasize the use of picture cues or discourage children to "sound out" words and focus on recognizing "whole words" is often referred to as "balanced literacy" but this approach is not supported to evidence evidence as part of the SoR (for an overview of the SoR and best practices see: https://www.thereadingleague.org/what-is-the-science-of-reading/defining-guide-ebook/)

Leveled Readers vs. Decodable Books

One prominent approach used in "balanced literacy" curricula is to provide children with so-called 'Leveled Readers', in print or (less often) in a digital format. Leveled readers provide children with libraries of books that are designed for their specific "reading level". They often contain illustrations that are designed to help children understand the text they are reading. Put

differently, leveled readers aim to make the text that children read predictable through the use of repetition and picture cues. In this way, leveled readers are aligned with the 'whole word' or "balanced literacy" approach to reading instruction. Approaches that emphasize the use of cues (e.g. illustrations, sentence context, word shapes etc.) have not been shown to be effective tools for reading instruction. An analysis of some of the most commonly used curricula in the United States suggest that most of them are designed to teach cueing to facilitate children's reading rather than to rely on decoding (see: bit.ly/3H67InL). Therefore, while leveled readers are popular and in wide use, they are grounded in approaches to reading instruction which have been shown to be ineffective.

Leveled readers have also been criticized for the way in which levels are determined. This is frequently done by the perceived difficulty of the book (e.g.; vocabulary levels) rather than being aligned with the child's decoding skills and their knowledge of foundation skills which should be taught in highly explicit, systematic ways (e.g. see structured literacy approach).

An alternative to leveled readers are so-called *decodable books*. In contrast to leveled readers, the aim of 'decodable books' is to encourage children to rely on using "sounding out" (decoding) strategies to read unfamiliar words and to use their foundation skills in decoding and oral language skills as well as skills foundational to language comprehension (see a guide here for an overview of structural literacy https://app.box.com/s/mvuvhel6qaj8tghvu1nl75i0ndnlp0yz). Importantly, these books are designed to meet children at their level of decoding by presenting them with text that they can decode without guessing or the use of cues. In other words, the text in decodable books is chosen carefully so that children can use their foundational decoding skills to read the text. Therefore decodable books are aligned with the simple view of reading, discussed above.

Decodable Readers	Leveled Readers
Phonetically decodable text	Predictable Text
Intentionally aligned with child's decoding skills	Not intentionally aligned with child's decoding skills
Encourages phonics strategies such as sounding out words	Encourages guessing through use of cues
Introduces irregular (with respect to sound-letter mapping) gradually	Uses many non-decodable words from the beginning. Levels

Contains supportive illustrations	Illustrations designed to help with understanding the story and words in book

Table 1: Overview of differences between decodable and leveled readers. Adapted from: https://tinyurl.com/mtr448wt

As the above table illustrates, leveled readers encourage strategies that are not based on the science of reading. Furthermore, the levels are not intentionally designed to meet the child at their level of decoding. Instead, it uses the perceived difficulty of the text to determine levels. Current programs that are more closely aligned with the leveled readers approach, such as LTM, could be redesigned to become programs that give children access to decodable books. This would require ensuring that the sequence of books is structured in such a way that it begins with books that contain highly regular words and gradually increases in terms of the demands of the books on decoding.

The importance of the socio-linguistic context

a.) Learning to Read Arabic

It is critical to acknowledge that much of the research that grounds the content discussed above comes from studies of emerging readers of the English language (Daniels & Share, 2017). Given that LTMs market focus is on learning to read in Arabic, it is critical for this LEAP project to examine what we know about reading development in Arabic and the extent to which recommendations from the Science of Reading can be generalized to learning to read in Arabic. In the below we provide an overview of some of the unique aspects of learning to read and Arabic and consider the extent to which the recommendations from the SoR can be generalized to learning to read in Arabic. We note at the outset, that this review is not comprehensive and therefore strongly recommend that a more detailed literature review (in collaboration with a scientific consultant) should be conducted/commissioned that could inform the development of LTM going forward and thereby ensure that LTM is aligned with what we know about learning to read Arabic.

Arabic, like English, is an alphabetic language. However, Arabic differs in a number of ways. In a detailed literature review of what is known about learning to read in Arabic, Al Ghanem and Kearns (2014) provide a detailed review of what is known about how children learn to read Arabic. They note that Arabic is written in cursive and that the orthography is very detailed. They note that there can be very subtle differences in the visual appearance of letters and words. Furthermore, the authors discuss the fact that written Arabic has two orthographic

forms. Specifically, while older children read a form of the orthography that does not contain vowels, beginning readers learn a transparent vowelized Arabic script. They also note that in several Arabic speaking countries there is an emphasis on orthography in reading instruction. However, despite the detailed orthography, the empirical literature reviewed by Al Ghanem and Kearns (2014) did not indicate that orthographic skills were a strong predictor of individual differences in children's reading skills, that is differences between children in terms of how advanced they are in their reading development. Against this background, a strong instructional focus on orthography may not be warranted.

With respect to phonology, Al Ghanem and Kearns (2014) note that speakers of Arabic use two different forms of spoken Arabic that differ from one another in their phoneme systems. On the one hand Modern Standard Arabic (MSA) is spoken in formal settings and is used in mass media communications, such as television news. On the other hand, speakers of Arabic use various forms of spoken Arabic Vernacular (SAV) that all diverge from the MSA in their phoneme systems. This means that children learning to read in Arabic are growing up in a highly diglossic environment in which two forms of Arabic language are spoken in different contexts. Reading instruction, including that delivered by LTM, is focussed on teaching children to read MSA.

Despite these differences, the literature review by Al Ghanem and Kearns (2014) suggests that phonological skills are related to reading in the different forms of Arabic and that poor Arabic readers have very weak phonological skills. The review of the literature suggests that phonological skills are related to reading for both vowelized and un-vowelized forms of Arabic. Furthermore, phonological skills have been shown to contribute to reading development in Arabic in both early as well as later grades. *Therefore the importance of phonological skills for the development of word reading skills can be generalized to the learning to read Arabic* (also see: Abu-Ahmad, H. A., Ibrahim, R., & Share, D. L. (2014))*.*

Importantly,   Al Ghanem and Kearns (2014) note that despite the clear importance of phonological skills they could not find much of an emphasis on phonological skills in the national curricula of both Saudi Arabia and Egypt. *In view of the evident importance of phonological skills for learning to read Arabic, the authors recommend that training students phonological skills and providing them with phonics instruction will help both early and later readers and would be particularly important for students with reading difficulties. LTM may consider how these empirical research findings regarding the importance of systematic phonological skill training may affect their product going forward.*

Furthermore, although phonological skills have been shown to predict both reading MSA and SAV, there is ample evidence to suggest that learning to read in a highly disglossic contexts (in which the language in which students learn to read differs from that spoken everyday life) has a negative effect on literacy levels overall and has a negative influence on children's word reading

accuracy and fluency (e.g. Ayari (1996); Saiegh-Haddad & Schiff (2016)). *It is recommended that LTM consider the role the disglossic context may play in student learning of Arabic on the LTM platform.*

b.) Learning to Read Arabic in Context

In addition to considering the unique psycholinguistic properties of Arabic, the broader contexts within which children are learning to read Arabic needs to be carefully considered. *In particular, it is important to analyze what role is played by the language used in the home, whether schools are teaching subjects other than Arabic in Arabic spoken language and to what extent students are bilingual and if they are which language they use most dominantly. In this context it is also important to note that the fact that children are being taught to read MSA, while they are mainly exposed to SAV in their daily lives may have a significant effect.*

During our meetings there was some discussion of the role of dialects and ways of perhaps thinking of integrating this into LTM. This could be a promising way of minimizing the disglossic effects and could drive engagement.

c.) Reading motivation in the sociolinguistic context

Intrinsic reading motivation can be loosely defined as being interested in reading and, most importantly, finding enjoyment in reading or being read to (e.g., Guthrie & Wigfiled, 2000; Schiefele et al., 2012). Research has suggested a positive relationship between increased intrinsic reading motivation and better reading skills and engagement with text (e.g., Becker et al., 2010; Froiland et al., 2012, De Naeghel et al., 2012, Schiefele et al., 2012). However, extrinsic factors can also influence reading motivation (extrinsic reading motivation) and can, for example, be in the form of recognition from caregivers or educators. Several studies have examined extrinsic and intrinsic reading motivation and their relationships to reading outcomes and these studies show mixed results but generally suggest improved reading outcomes as a result of intrinsic versus extrinsic motivation (Schaffner and Schiefele, 2016) but extrinsic reading motivation can initially lead to increased reading time (Guthrie et al., 2007; Pierce et al., 2003). There is at least one study that examined extrinsic and intrinsic reading motivation and home variables in an Arabic context (e.g., Yang et al., 2018) and results suggest a mixed picture but highlights the roles of the home literacy environment and extrinsic variables. However, more carefully designed experiments (maybe even within the LTM platform) are needed to determine the sociolinguistic influence of reading motivation and reading outcomes in the LTM customer base.

Takeaways and Recommendations

- Consider greater alignment with the SoR. We would emphasize that our analysis of SoR is relevant to all age groups. Perhaps through incorporation of decodable books and leveless readers and the design of outcome measures that are aligned with the SoR.

- Hiring a scientific advisor with strong expertise in learning to read in Arabic to help LTM align their product more closely with the SoR. We will provide LTM with a list of recommended experts and will introduce them to these experts and academic research institutions.
- Recommend commissioning a systematic review of the nuances of learning to read in Arabic and to assess what consequences such a review might have for LTM development going forward.
- We recommend that such a review focus not only on the unique features of written and spoken forms of Arabic but also include a review of what is known about the socio-cultural contexts in which children learn Arabic (e.g. the difference between MSA and SAV and how this affects engagement, motivation etc; the roles played by bilingualism and which language is dominant outside the language instruction context etc.)
- Explore the possibility of providing some books that are written in SAV.
- Partner with established research organizations that are studying reading and its development in the Arabic context. See for example: https://dyslexiaida.org/in-your-area-with-global-partners/

Recommended resources:
Reading Rockets:
https://www.readingrockets.org/article/print-speech-and-speech-print-mapping-early-literacy
National Center on Improving Literacy: https://improvingliteracy.org/
The Reading League: https://www.thereadingleague.org/
Florida Center for Reading Research: https://fcrr.org/
The International Dyslexia Association: https://dyslexiaida.org/
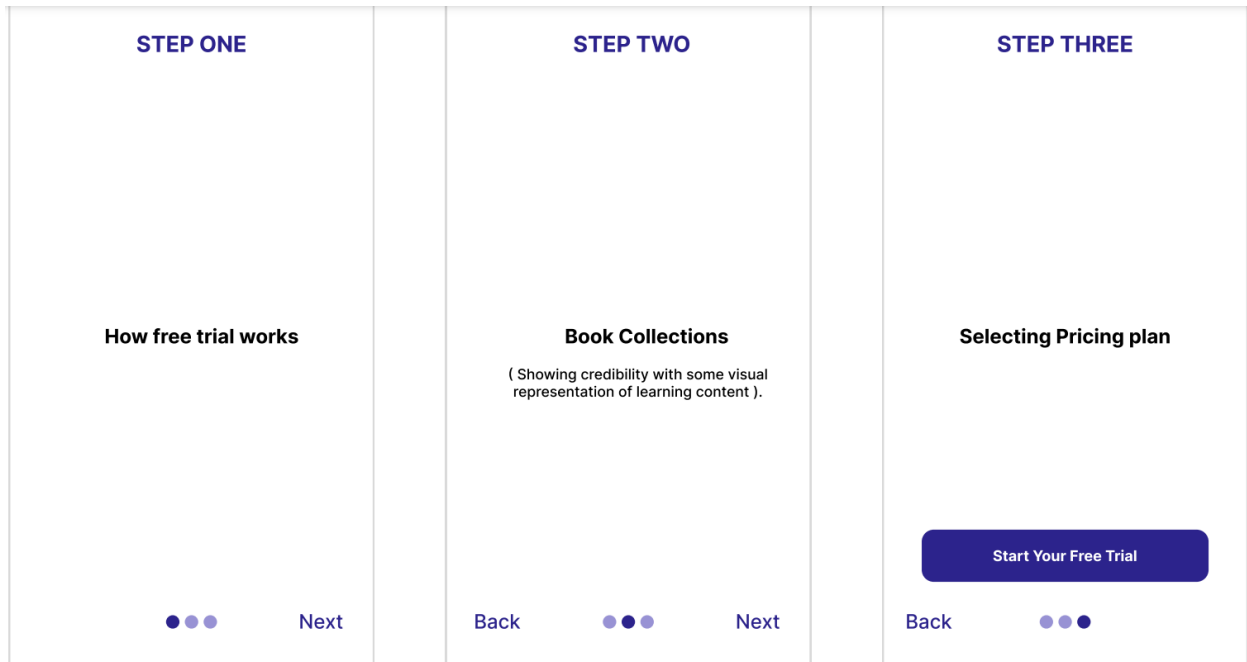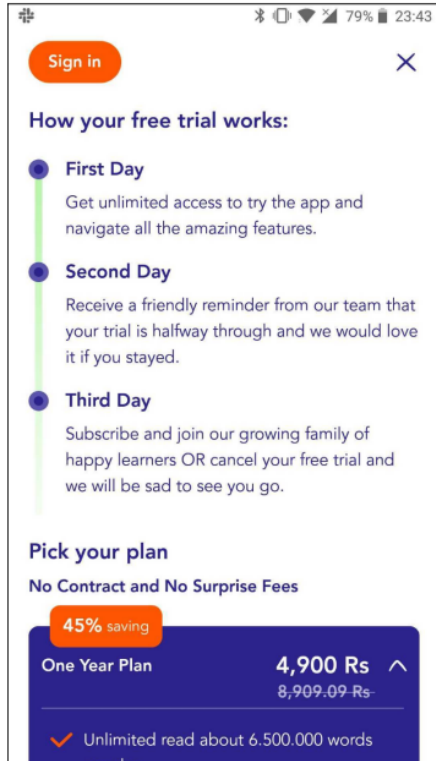**The Society for the Scientific Studies of Reading:** https://www.triplesr.org/

Recommendation 2: Product recommendations advising on an approach to user experience, gamification and feature development

While recommendation 1 explained how you might adopt a more evidence-based approach to the educational value of your product, this section will advise Little Thinking Minds on thinking about the product strategy and roadmap for the near future. This is with the intention of making your product strategy grounded in experimentation and testing and improving the user experience. The suggestions are based on references from comparable apps as well as insights from professionals who have worked on such products.

UI/UX Feedback

Here is some of the general feedback:

a) I Read Arabic App

● There are some screens where content needs to be broken up for easier visual consumption. The screen below is one such example where several different points are combined into one screen:

Sign in

How your free trial works:

First Day
Get unlimited access to try the app and navigate all the amazing features.

Second Day
Receive a friendly reminder from our team that your trial is halfway through and we would love it if you stayed.

Third Day
Subscribe and join our growing family of happy learners OR cancel your free trial and we will be sad to see you go.

Pick your plan
No Contract and No Surprise Fees

45% saving

One Year Plan   4,900 Rs
                       8,909.09 Rs

✓ Unlimited read about 6.500.000 words

STEP ONE	STEP TWO	STEP THREE
How free trial works	Book Collections	Selecting Pricing plan
	(Showing credibility with some visual representation of learning content).	
		Start Your Free Trial
●●● Next	Back ●●● Next	Back ●●●

We feel this is a better approach with more visual feedback on the content to be reviewed. Such an approach to breaking content down will make it easier to avoid content being missed by users.

- Judicious use of a 'skip' button could allow users to get through sections not of interest during onboarding without having to exit the app.
- There is some mis-match between video resolution and device resolution. Should pick a video format that looks equally good across devices since the current experience may vary depending on the device used.
- We found some places where text was overlapping with the images. While this might have been done intentionally, we felt many users may see it as a shortcoming in UI/UX. Some examples are shown below:
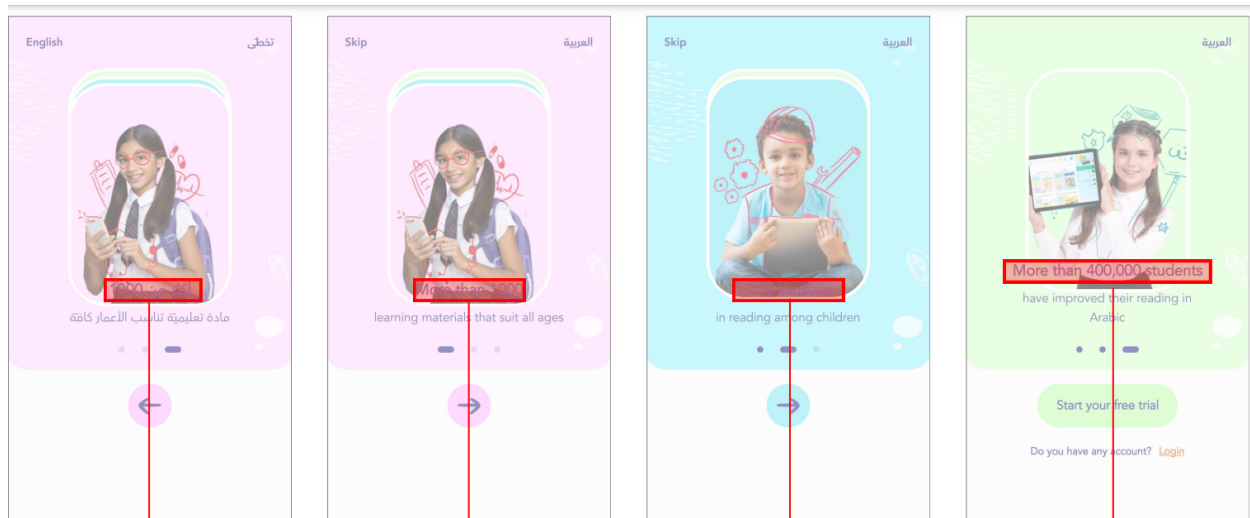
- For the same on-boarding process shown above, we found that sliding from left to right would be more intuitive than the current vertical movements.

● **Search**

3.1
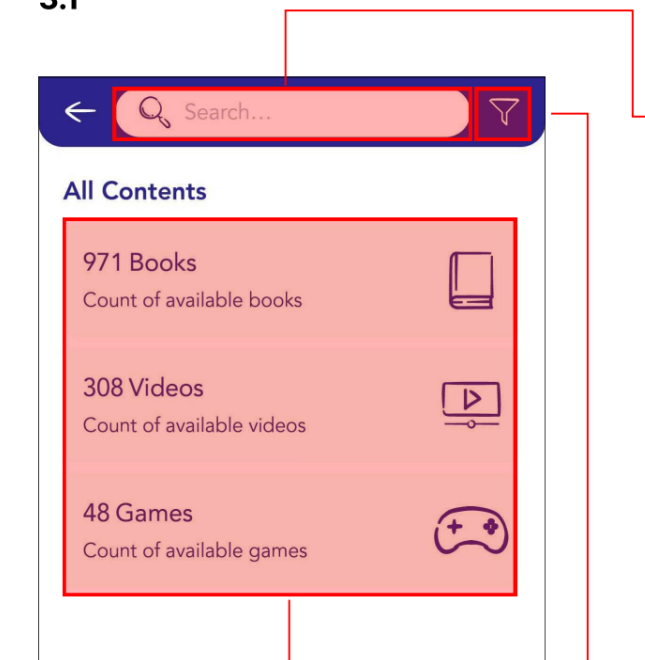
We had some suggestions on improving the experience on the search page that are generally the norm for such pages:

- The search bar lacks real time auto-complete and history of searches. Such features are very helpful in allowing search to be used in an effective and efficient manner.
- Seeing the top trending search items would also be a source of guidance for users
- We'd give the CommonSense Media app as a reference for strong search functionality where multiple categories are involved. You can have a look at their approach here: commonsensemedia.org

b) I Start Arabic App

This app is generally less further along in its development so the nature of feedback is different:

- It could benefit from a more colorful and playful layout comparable to the I Read Arabic app.
- Generally feel that you should stick with a vertical orientation as this is more intuitive and the norm for most such apps. Having to switch between vertical and horizontal orientations should be avoided. The best reference might be how

this is handled by the youtube app where you can view the video in vertical form but can also switch to horizontal viewing at your leisure.

- Review placement of buttons as the audio button looks out of reach for children at the moment.
- Should encourage the use of more visual/audio feedback on pressing buttons and more visual feedback on how far along you are within a book and other content.

UI/UX Process Feedback

- Use this reference to audit your app (mobile and web) and make sure button placement and size is optimal in every case. This is particularly important for global collaborations where organizations, particularly educational ones hold vendors responsible for conforming to these guidelines.

  https://www.w3.org/TR/WCAG21/

- Visualize where you want the user to spend most of the time in the app (even thinking about it in percentage terms) and assess whether you are giving proportional importance to that part on the screen and guiding users accordingly.
- Conduct some user experience testing where you observe users on the app and see where they get stuck, where they seem confused or where they seem to lose interest. Observing this first-hand and also extrapolating this from the data are ways to think about continuous improvement processes.
- Generally it looks like most apps go through an annual refresh on improving the user experience (without necessarily changing the brand look and feel) just to make sure they are following the latest designs and are likely to remain featured. You should also reach out to Apple/Google to recognize you as a major app in this region and get their guidance on what it takes to get featured.

Gamification Processes

While the UI/UX enhancements are being conducted with the intention of improving the immediate user experience (as measured by longer and repeat usage and use of varying functionality), we think gamification could potentially be a longer process with the intention of

building longer-term engagement through providing a purpose and reason to continue to play the game. Some of our recommendations are:

- Give users the option to set their own goals and guide them through the app accordingly (such as how much time a day they want to spend, what purpose they want to learn for). We've seen this used in Duolingo to increase customization and engagement.
- Allow them to personalize the content based on their topics of interest. This is another strategy adopted in the Duolingo app. This links to the point in the Science of Reading about familiarity with the topic. Allowing users to pick topics out of the themes in reading will also increase agency and should show improvement in time spent on the app and tasks completed.
- Make more elaborate use of leaderboards, badges and rewards. Consider adding map scenes as well as avatar purchases for higher engagement in usage
- Identify the metrics of interest: 1 day retention, 7 day retention, 30 day retention and experiment accordingly to optimize that
- Key metrics to look at could be:
  - Sessions/day
  - Lengths of sessions
  - Retention/attrition
  - Lifetime value
- Use your analytics tools to identify cohorts in the data and find their commonalities. This would give you clues as to user experience that can be leveraged among active users.
- Experiment in each sprint with changes that affect 10% users at a time and get compared to 10% of existing users. Adding some experiments to each sprint is a best practice in adopting an experimental approach
- Think about how to add surprises in the content, rewards/characters etc. You may often find that the data suggests that people keep playing to reach a surprise and continue to play after receiving one
- Ask kids what specific game mechanics they like and design accordingly. Kids may reference many simple game mechanics they find appealing and take naturally to games building on those. These could be 'battle' style games or puzzle style games where progress is linked to completion of learning tasks.
- Involve teachers in picking content, assigning content and being able to review dashboards of results. We've found that the more agency teachers have in using these tools, the more they tend to encourage their students to use them. This makes teachers your 'co-creators' and improves scalability. This also moves you towards more of a 'platform' model connecting students, teachers and schools through a common interface even as activities and content might vary.

- When it comes to the level of gamification, we feel you can adopt two approaches:
  - Some edtech apps use the Duolingo approach which has minimal gamification but still has a main character that interacts with you and a simple map interface showing your progress:
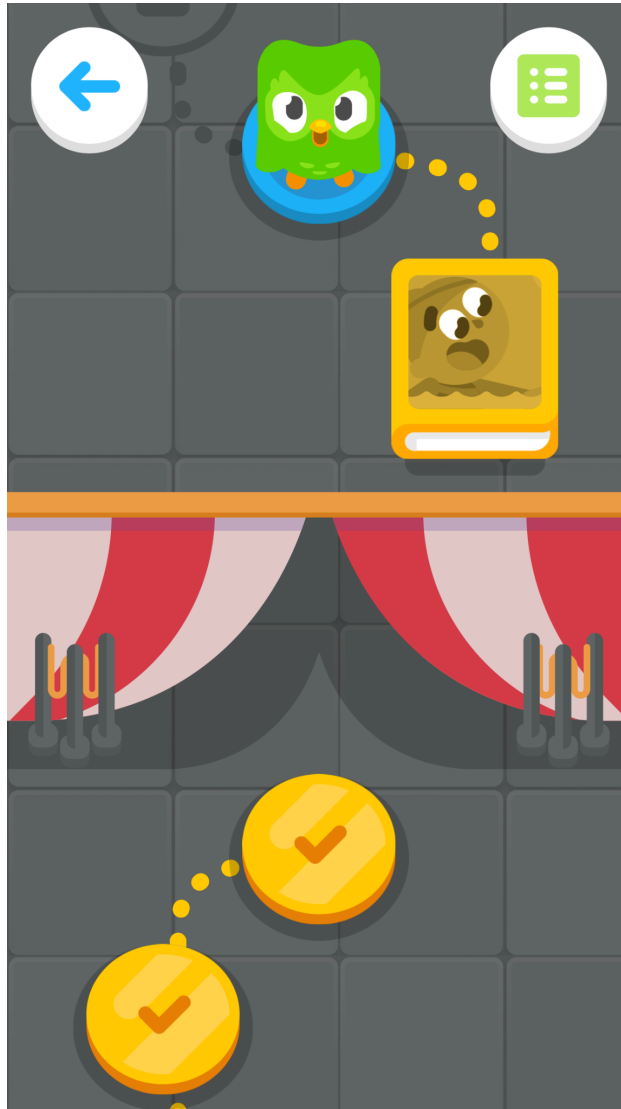
  - The other approach is to go for a more immersive experience such as that which is used by the Gamerize Dictionary (https://gamerize-dictionary.com/en/) which is an elaborate Role Playing Game in a market which appreciates games of such scale (with inspiration from titles like Pokemon). It allows users to engage in much more elaborate 'quests' and construct 'buildings' while fighting 'monsters'. They've found this to be quite popular in that market and demonstrating high engagement levels.

New Feature Development

We also feel LTM needs to plan to prioritize emerging technologies that are a part of current edtech development roadmaps to stay relevant and stay appealing to investors and other stakeholders. These are some of the areas we feel are relevant to you as well as our recommendations on how best to approach them:

Speech Recognition

We've heard from you that speech recognition is one of the areas you are looking to incorporate into the app. Some information we might share in this regard:
- Native speech recognition on Google/Apple devices often doesn't work that well since it has not been trained on your market of interest (native Arabic speakers in a certain age group who may have their own specifics with regards to pitch, syntax and other considerations).
- You will find specialized companies that have developed proprietary speech recognition algorithms that are optimized for certain age groups. We recommend speaking to Soapbox Labs which has experience in developing such an algorithm https://www.soapboxlabs.com/). You should consider approaching them for a partnership opportunity specific to your target group. They also have a wealth of resources on their website with regards to the technicalities of speech recognition and will also give you many ideas on how to integrate speech recognition into a range of activities.
- Speech recognition algorithms often come with 'thresholds' that can be dynamically adjusted by you to encourage struggling students and help refine the approach of the stronger ones.

AI/Chat GPT

Duolingo has incorporated Chat GPT in two scenarios (https://blog.duolingo.com/duolingo-max/):

- Getting explanations. This allows users to get more detailed answers on why a certain response is incorrect (beyond what you might be able to program into the regular app).
- Role playing. Conversational approaches with Chat GPT that help users get language learning experience through speaking with the equivalent of a chatbot.

We can share with you that in Pakistan, groups are setting up Urdu text based versions of Chat GPT through open-source and industry efforts as well as government and academic

contributions. We think you should push for such an effort at this point to get a more central role in Arabic language teaching and identify partners who are keen to make this happen.

Besides this, you can still incorporate AI in more limited ways within your existing app. Keeping track of common errors and making users repeat and practice them with certain frequencies and spacing can demonstrate learning improvements.

Our overall recommendation for this section are:
- There are some 'easy wins' you can get on the side of UI/UX. Improving search functionality, fixing orientations and some features like messaging that should be high priority in getting a slicker app. We expect the data here will show increased ease of usage and finding things. This could conceivably be a priority over the next 6 months.
- There are some longer term strategies for developing a platform. We feel just having some form of map/progression along the lines of Duolingo with a more playful feel can improve engagement and if you are successful there, you can potentially evolve to some of the features of a more immersive platform like Gamerize with a larger sense of quests and avatars. This is something you should consider over a 12 month timeline.
- In either case, we recommend developing an experimental approach where you roll out sprint-wise updates to small populations to test their response.
- We think you should have an R&D effort focused on new areas like speech recognition and Chat GPT incorporation as investors and stakeholders expect this even if the horizon for launching such features might be 1-2 years.

Recommendation 3: Considerations for integrating Science of Reading into company marketing and positioning

Integrating recommendations 1 and 2 into the LTM model will support greater efficacy and usage of the LTM products. With more rigor around the product's leverage of the Science of Reading, there will be a credible foundation for LTM to prove and measure improvement of learning outcomes. With better UX/UI design, users will engage with the product more resulting in longer term customer contracts and happy customers at the student, teacher and school levels. Ultimately, this will benefit LTM's core stakeholders including students, teachers, schools, investors and partners, and be important elements to integrate into marketing and fundraising efforts.

For context, LTM's growth strategy is focused on penetrating private schools in Saudi Arabia, United Arab Emirates (UAE) and Qatar, and public schools in Saudi Arabia, Iraq and other parts of MENA.

This section will focus on general guidelines and best practices for integrating research-backed approaches into marketing materials and examples of these practices from LTM's competitor and peer set and other edtech companies. This information is not specific to LTM's operating context in MENA.

Edtech nuances for marketing and fundraising
It will be important for LTM to customize these messaging practices for their various audiences, especially when seeking investment from different stakeholders including NGOs and impact investors who are more likely to reward LTM's use of evidence-based practices. While more traditional investors will care about this as well, LTM will want to keep its messaging balanced between business objectives and learning outcome objectives. Ideally, the two are tightly correlated but in practice, this is often difficult to achieve.

A 2019 Forbes article articulates a dichotomy of edtech well:

> "Keep in mind the differences in positioning to schools/customers and investors, too. Edtech sits at the intersection of two disparate industries: the highly regulated and notorious slow-moving public-sector of education, and the rapidly-evolving world of

tech. Investors love to hear that a company is only 4 years old and growing 80% YoY – but educators often worry that a young company may not be around for the long haul. Given their lengthy buying cycles and budget approval process, being a young company is a decided disadvantage. Keep in mind who you're talking to as you decide which elements of your company to highlight."

LTM will have to both prove that it can shift learning outcomes *and* retain and delight its customers to continue to attract diverse streams of revenue. This is an important and delicate balance.

<u>Best practices for integrating research-backed approaches into marketing materials</u>

Talk about specific value
It will benefit LTM to truly understand the value that its product brings to each user group: students, teachers and schools. This will help its messaging be clear, effective and genuine. For example, describing a product as "motivating" students is less compelling than demonstrating what happened because of that motivation, such as "Our product motivates students to speak more Arabic at home based on surveys of parents."

Often eliciting feedback from users in multiple ways such as surveys, focus groups, product enabled polls, and 1:1 discussions can bring these examples to life. Taglines are more effective when paired when real-life stories of how the value proposition manifests in a students, teacher or administrator's life.

Create layers of credibility
Simply stating that a product uses "science" and "evidence-based" approaches is helpful, but lacks transparency. These terms are quite broad, and do not give the organization enough credit for this work. Organizations that can cite specific advisors, curricula, or methodologies can build more trust with those seeking to understand the *how* and *what* of the product.

Other signs of credibility include 3rd party verification, awards won, honors given to the organization and external partners. These are all signals that the organization takes these claims seriously and is prepared to defend them if questioned.

Speak to the right audience in the right place
LTM's public marketing materials are targeted at many audiences: students, teachers, schools, investors, partners, etc. This makes it difficult to capture all of the audiences' needs in one place. A couple of best practices to help with this include:
- Having multiple links designed for specific audiences
  - In LTM's case, a page for "Investors" may be helpful to add more information about the rigor behind the curricula

- Have a place where website browsers can request more specific information based on what they're interested in
  - Ex.) Having a place with the text "Want to learn more about our science-based approach? Click here" can lead browsers to a blog post, PDF or contact form that helps LTM understand who is most interested in this content and provide it without sacrificing precious space on the core parts of the website

Moreover, LTM should include at least one slide in their investor pitch deck on how they plan to integrate the Science of Reading or other research-backed methodologies into their curricula and product. It can reference the LEAP project as an external consulting partnership that aimed to create more rigor around this process, signaling that LTM is willing to make investments in this area of the organization.

<u>Examples of these practices and feedback on LTM</u>

LTM website and copy could be even more specific
The LTM website has generic language around science and methods in a few places, and a fantastic page that talks about specific features of the product that is influenced by them. However, once the organization has a learning scientist in place for the necessary guidance, the organization could consider going further to define what those scientific methods are and why they chose to adhere to them. This would differentiate LTM from others. Having a separate page to highlight this could also be helpful. LTM could consider including a quote from an advisor, partner or consultant or leveraging media or studies that conclude that incorporating such rigor improves student outcomes.

Source: LTM website

Features designed to effectively support curriculum standards implementation and enhance learning

Leveled Educational Programs

- Designed by literacy experts and aligned with regional national curricula
- Holistic approach to learning and teaching that aims to advance the quality of fluency and literacy in a child safe environment
- Offers various levels based on scientific rubrics and measurable learning outcomes per level
- Aims to enhance Arabic language acquisition for native and non-native leaners from KG-12
- Interactive content provided in multiple formats that cater to every type of learner profile (e-books, flash cards, audio books, videos, digital activities, assessments)
- Widest selection of content sources from award-winning publishers and created by literacy experts
- Gamified and reward based journey

STUDENT CENTERED TEACHING & LEARNING

- Differentiation within the same classroom
- Insight-driven intervention
- Multiple assessments to measure improvement of learning outcomes
- Placement tests to determine student level
- End of level diagnostic tests for remediation
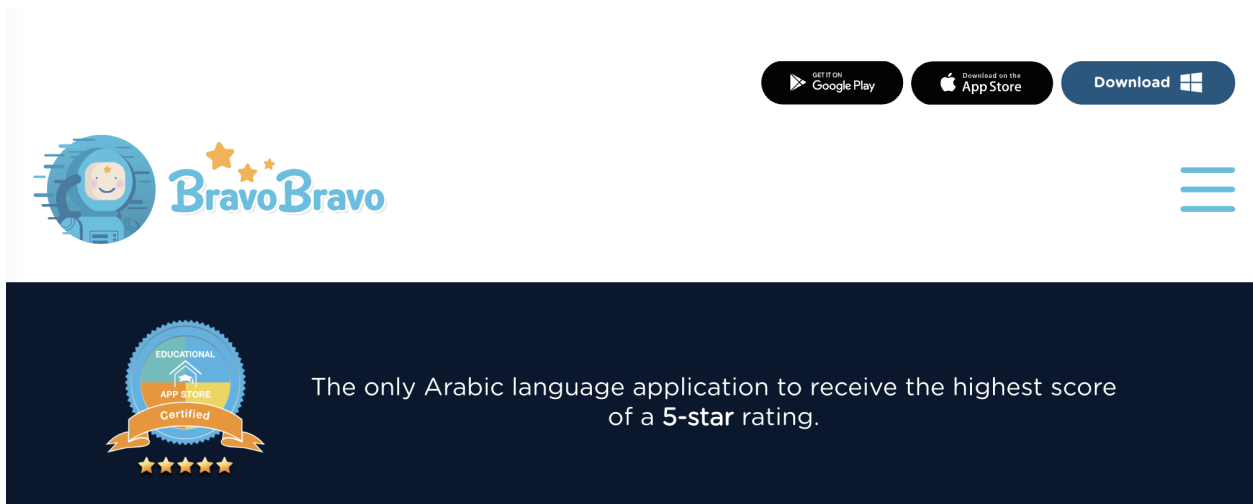- Leveled lesson plans developed by pedagogy experts

Source: LTM website
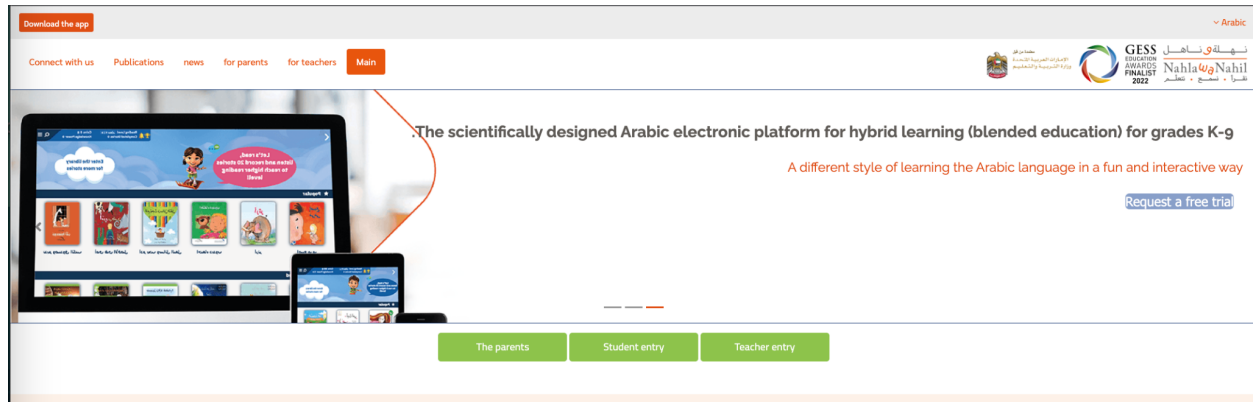
Source:

Third party verifications can grab user attention

The Bravo Bravo app prominently displays its verification via the Educational App Store Certificate. This is one of the first things a user sees when coming to the webpage and provides a stamp of approval to the average user. If this certificate is something that LTM stakeholders value, they may consider applying for this.
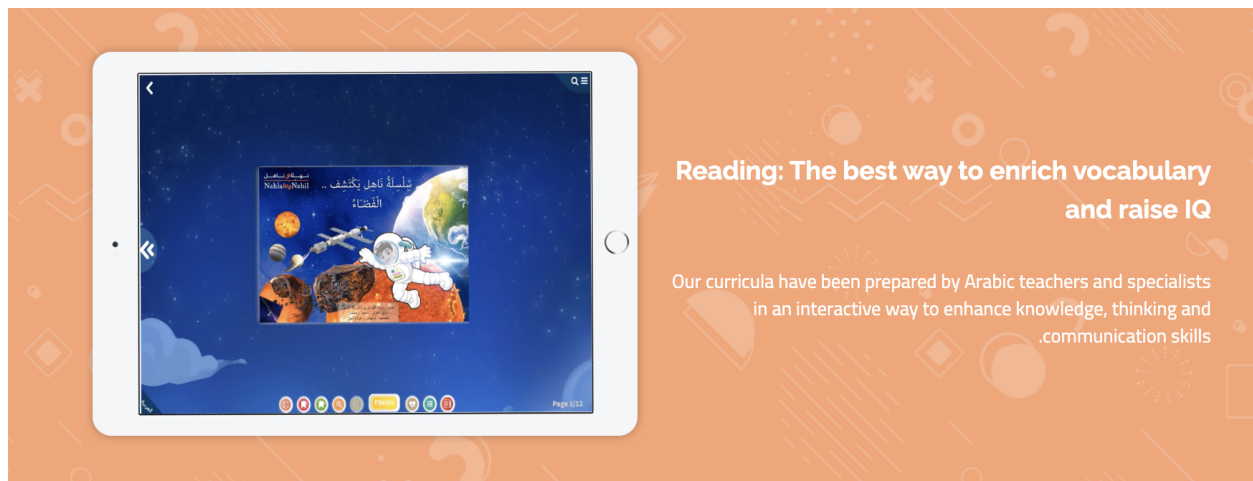

Source:

Specific language for outcomes is helpful

While the Nahla wa Nahel website includes a vague "scientifically designed" phrase in its tagline, it does substantiate these a bit more by claiming two outcomes from its products: enriched vocabulary and raised IQ.

Source:

Source:

Credibility can be created despite broad language
Alef has many impressive partnerships (i.e., Google, Microsoft) boasted throughout its website that gives the organization credibility, yet the language around learning design is not very specific. This could be strengthened by referencing which standards and curricula it aligns with. It is sensible to not include all specifics in this short paragraph, but there could be a link to more information for those interested.

Alef also builds credibility by sharing its research papers with team members as authors.

Who we are What we do Why choose Alef Where we are Media Contact Our Research Privacy Login

LEARNING DESIGN

Alef Education designs impactful learning experiences for students cutomized to different curriculums.

CURRICULUM DESIGN

Learning journeys are designed with outcomes in mind, aligning with various curricula and international standards and their end-of-year expectations for student growth and achievement.
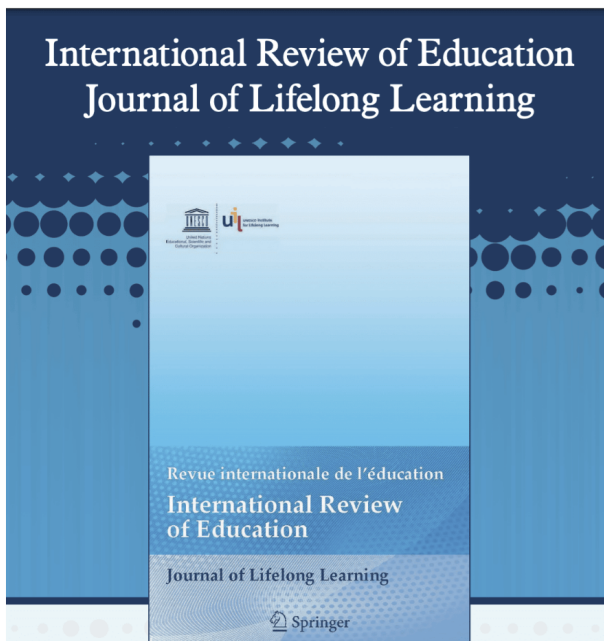
ASSESSMENT WRITING

Assessments are designed according to required depths of knowledge and proficiencies associated with skill mastery. Assessments are balanced and continuous, and used as opportunities to reflect upon student progress, motivation and choice of strategies.

Source: Alef website

Who we are What we do Why choose Alef Where we are Media Contact Our Research Privacy Login

International Review of Education
Journal of Lifelong Learning

Revue internationale de l'éducation
International Review of Education
Journal of Lifelong Learning
Springer

EVIDENCE-BASED EDUCATION REFORM TO INTEGRATE GLOBAL COMPETENCE INTO ABU DHABI K12 PUBLIC SCHOOLS FOR 21ST CENTURY LEARNING

Author Names & Affiliations: Xin Miao (Alef Education) Ali Nadaf (Alef Education) Zhuotong Zhou (Alef Education)

As our world goes through tremendous global and local changes over the last decades, international organizations (i.e. UN and OECD) and national governments have been adopting new policies and strategies across sectors to tackle issues of local and global significance such as digital & technological revolution, climate change, global pandemic, sustainable developments. Global competence has [...]

Source: Alef website

We recommend that once LTM reviews its marketing materials for areas where it can incorporate some of these best practices. Doing so may separate them from their competition and leave little doubt that LTM incorporates rigor into its products. If LTM considers the suggestions in Recommendation 1 and decides to advance its product through the Science of Reading, referencing some of the materials and frameworks in that section may be helpful on their website, and certainly in their investor pitch decks. Moreover, if LTM has a credible advisor or consultant on an ongoing basis, highlighting this individual's role within the organization will be critical. LTM can create a team page, blog content, social media posts, or dedicate pages of its pitch deck to show its dedication to this area by having this critical team member support the organization.

Conclusion

Looking at all these different recommendations, we have some overall conclusions as well:

- We recognize that it is a leading product with much potential. We think an initial focus on enhancing the user experience and approach to messaging can go a long way in getting you more outreach and growth right away. We think metrics like engagement books completed, phonemic awareness, fluency and comprehension still have value at this point outside of specific metrics around reading ability. We also feel you can focus on how children increase confidence through this product or are more involved in class. You can also use the EGRA-Arabic tool at this point.
- You should be clear at this point that the product is, at present, not aligned with the Science of Reading and is not based on evidence. The truth is most edtech products are not so you are not an outlier in any case. By recognizing this now, you have the chance to take the lead in evidence based learning through edtech products.
- We'd also like to emphasize that we are not suggesting you revamp the product. The backend and your programs are all good. It is the front-end user experience that we are suggesting can be tweaked in the long run to make a product that is more focused on learning outcomes. We recognize that this change would happen in phases and your market would also need to be educated accordingly.
- We'd also emphasize that decodable books are just one of the ways you can achieve this, just the particular one we recommend most based on what we know at present. We think it will most of all benefit the younger ages and you'll see instant results in how they pick up reading.
- We realize it's challenging to involve a consultant/learning science professional. Such people would generally only be available part-time. We'd encourage you to prioritize someone with private sector experience who has interest in these specific problems. You could focus on solving the problem of developing decodable books as part of an effort of educating users on their value.

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