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The Talking Book Programme

Case study by UNESCO-Pearson Initiative for Literacy



Name

The Talking Book Programme



Location

Ghana, Kenya, Rwanda, Uganda



Implementing organization

Literacy Bridge



Year launched

2007



Focus of intervention

Improve health, income and quality of life for underserved communities



Reach

Over 400,000 users in currently active programmes

Summary

In Ghana, UNESCO estimated that in 2015 almost a quarter of the adult population could not read (UIS, 2017). Low literacy and geographic isolation are major barriers to improved livelihoods for many individuals in the country. Extension services in agriculture and health to this population are limited because of poorly maintained roads. When materials are available, limited reading proficiency prevents access to information about improved farming strategies and disease prevention.

The Talking Book Programme combines the oral tradition of storytelling with modern technology to present topics related to agriculture and health extension services. Developed in 2007 by Literacy Bridge, a US-based non-governmental organization (NGO), the portable device operates as an easy to use audio library. Pre-recorded content offers practical information aimed at improving the quality of life for rural and underserved communities throughout Ghana, and more recently Kenya, Rwanda and Uganda. An interactive feature built into the device allows listeners to record additional content and provide user feedback. The devices also have the capacity to store usage data, which is continuously analysed by Literacy Bridge for ongoing programme improvement.

To date, the Talking Book Programme has reached over 400,000 rural beneficiaries in Africa and has led to many positive outcomes. Literacy Bridge believes in the importance of measuring the results of its work. In a recent study, 1,000 participants were randomly selected across twenty-four treatment and control communities to assess the impact of one year's implementation of the Talking Book programme. Results demonstrated that programme participants were 50 per cent more likely to wash their hands with soap and use bed nets than the control group (Literacy Bridge, 2016). These results build on earlier findings that demonstrated over 90 per cent application of a new health or agricultural practice associated with exposure to the Talking Book material, and a 48 per cent higher crop yield among farmers (Literacy Bridge, 2012).

ABOUT THIS CASE STUDY

Through the UNESCO-Pearson Initiative for Literacy: Improved Livelihoods in a Digital World, this case study is part of a series highlighting how inclusive digital solutions can help people with low skills or low literacy levels use technology in ways that support skills development and, ultimately, improve livelihoods – in contribution to achieving the Sustainable Development Goal on education. For more information go to en.unesco.org/themes/literacy-all/pearson-initiative.

Why selected

After ten years, the Talking Book Programme has demonstrated sustainability and scalability. While the solution is based on relatively simple technology – an audio player – it is highly appropriate for the target audience and their environment. The lessons learned from a decade of designing, implementing and refining a digital solution with low-skilled and low-literacy communities are worth sharing.

Key takeaways

- 1 / Literacy Bridge understands the importance of properly introducing technology into a community through intentional field-testing and iteration.
- 2 / The continuous user feedback loop and data capture process built into the design allows Literacy Bridge to make constant improvements to the user experience while facilitating monitoring and evaluation efforts.
- 3 / The Talking Book Programme applies a new, affiliate partnership model for creating contextualized content and expanding services.

Context and project origins

Information around health, agriculture and income generation is already widely available in developing countries. However, a major challenge remains in providing access to knowledge for geographically isolated and low-literacy individuals. Some communities in rural Ghana can take up to 15 hours to reach from the regional capital, and are only accessible by motorbike because of the rough terrain.

In developing countries, previous attempts to respond to this challenge utilized existing technology such as radio and cellular phones. However, such interventions have been limited in their ability to incorporate an inclusive design approach. Radio broadcast does not allow users to pause or repeat content. Radio is also limited in its ability to incorporate a built-in feedback channel or capture data on user statistics. Other interventions that deploy content through text messaging via mobile phones require a minimum level

“ Our technology does what cell phones can’t. ”

of reading proficiency, which many farmers do not have, as well as cellular connectivity, which may be unavailable. Further, mobile-based voice response interventions may be too expensive for marginalized and rural groups.

The initial target demographic for the Talking Book is adults and children in rural areas of Ghana. Limited connectivity, isolated geographic location, and communities with low literacy skills are common realities among this group. Rural Ghanaian families are often overlooked by efforts to boost crop yields, distribute life-saving vaccines, or improve sanitation and hygiene conditions for preventing the spread of disease.



Designing with the user

The design of the Talking Book digital solution is the result of an extensive prototyping process informed by various field visits. Participatory research on the product design emphasized functional characteristics including colour, button placement, iconography, and overall look and feel of the device. The result is a durable and intuitive design, accessible through simple-to-navigate audio menus providing dozens of hours of educational listening content and training. Lessons can be played on demand, and are loud enough to be heard in group settings to encourage dialogue among listeners.



Literacy Bridge toured multiple communities throughout Ghana with an early version of the device to arrive at an updated prototype prior to implementation. During these visits, the team discovered several key design issues that needed to be addressed in developing an adequate prototype.

- 1 / Device orientation.** The initial design did not come with any lettering, causing some users to hold the device differently from the way it was intended. This feedback inspired the team to experiment with a vertically asymmetrical design that helps users select the intended orientation.
- 2 / Color options.** The colour of the device was another point of interest during the initial user-centred design process. While they liked the original orange colour, many community members requested a variety of colour options. The resulting colours are sometimes used to distinguish between intended groups of users (women, men, health volunteers and so on).
- 3 / Dimensions.** Literacy Bridge was interested in user feedback on the size and weight of the device. Adult users offered positive feedback regarding the overall look and feel. A suggestion to help improve functionality among school-age users was to allow the device to be used with a piece of material that children could carry over a shoulder or around their neck. While a lanyard hole was already built into the early design, this feedback helped the team understand the specific requirements and improve on the initial design.
- 4 / Audio content.** Many of the communities requested content for improving health and agricultural strategies as well as information about starting a small business. While Literacy Bridge does not create the content directly, this feedback was informative for directing local partnership efforts with specific organizations for content development, and distribution activities in mother-tongue languages.
- 5 / Data Transfer.** Early iterations of the device included an integrated USB cable so content could be copied from one device to another. However, Literacy Bridge found that the most efficient way to ensure all Talking Books had the latest content was to gather the entire community and update all the devices together. Early field testing revealed that relying on peer-to-peer transfer did not effectively capture all usage statistics and produced delays in content updates. Therefore, the team removed the USB cable in the current model since it had a cost but showed no results in achieving their mission or their partners' goals.

Informed by these early field-testing efforts, the revised prototype design incorporated several upgrades. The new design included ten buttons and a front-facing speaker (Figure 1). The dashboard included a play/pause button, four programmable arrow keys to navigate the audio menu, a record button with built-in microphone, two volume buttons, a home button, and an asterisk used for selection. The rear of the device incorporated a larger hook for attaching a lanyard as well as a headphone jack and AC port for listeners with access to electricity. Surrounding the device was a silicone bumper to protect the device from impact and keep out dust and water.

Years later, the display menu was altered to respond to local contexts. Many communities where Talking Book is deployed do not have a word in their language for arrow (the main navigation icon on the 2008 prototype). Therefore, Literacy Bridge sought to update the navigation menu to a set of easily identifiable icons common in the listener's native language. As part of this process, the design team conducted two primary activities to select a new set of icons.

- 1 First, the team tested the response time to identify each of the proposed icons after hearing its name spoken in the local language.
- 2 Next, the team field tested the devices with various combinations of high-response icons so that they could learn how users responded to the combinations (Figure 2).

The ultimate goals of the icon update were clarity and simplicity, but they also wanted the collection of icons to evoke positive feelings from the users. This meant Literacy Bridge was careful not to select a set of icons that made the device feel like a children's toy, for instance. After dozens of hours of field testing and redesigning, the team decided to change the left and right arrows to hands, while the up and down arrows were replaced with a mango tree and table, respectively. The central play/pause button was changed to a bowl, while the asterisk was changed to a five-point star. The recording circle and plus/minus icons remained unchanged (Figure 3).



Figure 1.
Prototype of the
Talking Book device, 2008



Figure 2.
Various icon combinations
for the Talking Book



Figure 3.
Selected Talking Book
icon set, 2012

The digital solution

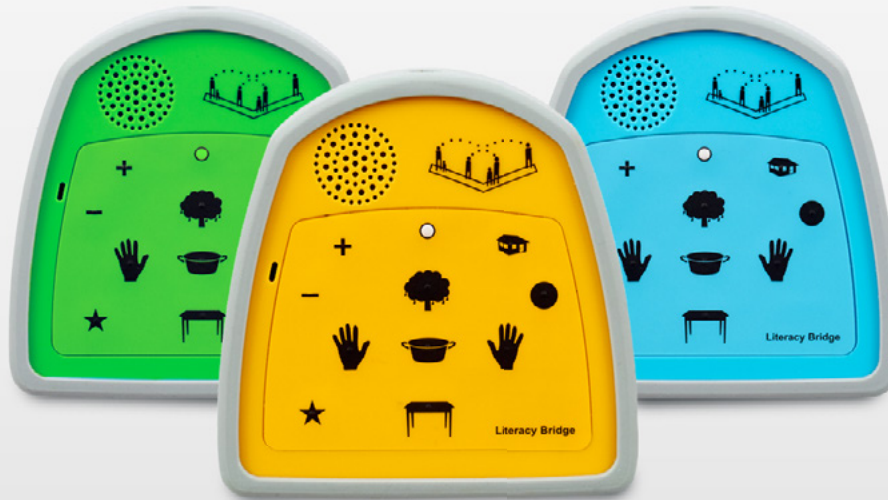


Figure 4. Current user interface design

The Talking Book was designed to provide a low-cost solution for accessing locally relevant content in real time. The device operates as an audio library that connects families with educational lessons on appropriate health and farming practices. Given the cultural and linguistic diversity where the Talking Book is deployed, programme content is provided in mother-tongue languages in the form of songs, interviews and dramas.

The Talking Book is handheld, durable and powered by two size-D batteries that provide up to 15 hours of playback. The device allows users to play, record and categorize audio clips, and to copy content directly to any other Talking Book. Once powered on, spoken instructions guide listeners through the user interface. An audio menu allows listeners to navigate available categories of content which are selected by key presses. Each device might contain up to fifteen audio messages across ten categories for a total lesson capacity of 150 messages (Schmidt et al., 2012).

INSIGHT

Avoid information overload

A practical limitation when designing solutions is the human capacity for learning within a finite timeframe. The devices are never loaded with the full capacity of 150 messages because Literacy Bridge believes that users would not absorb all the knowledge or change their attitudes or practices in accordance with all 150 messages at once. Therefore, the team applies a more targeted dissemination approach as part of a 3-month goal. This practice started as a function of the limited storage capacity on each device before evolving into a pedagogical strategy. For instance, formal classroom instruction avoids overwhelming learners with an abundance of new concepts each term. Through focus group trials, Literacy Bridge concluded that five or six messages per category was a sufficient amount of content to be absorbed by listeners within each 3-month target window.

In addition to lesson content, the Talking Book is programmable, so applications can be added to check on the knowledge that has been imparted. Short surveys and quizzes assess user knowledge and potential behaviour change in real time. After each message, a user can choose to answer a question about the content. For instance, after the message the user is asked to 'Press the Tree if you plan to apply what you learned from this message. Press the Table if you did not find this message useful.' The response is then logged and processed along with other usage statistics. Another type of knowledge application is through a short quiz. After a message on improving agricultural strategies, the user is asked, 'What is the best month to plant maize? Press the Tree for May or the Table for July.' Instant feedback is given to the user, and the user response is logged. Embedded 'audio hyperlinks' allow listeners to pause a message to go to a linked audio clip that defines a key concept or further elaborates on a subtopic.

An important feature of the Talking Book user design is that listeners can record their own messages to ask questions and share feedback, allowing a constant communication loop with Literacy Bridge for enhancing the user experience. The portable audio library has onboard storage capacity for capturing user statistics and storing user recorded messages. In early versions of the device, the recorded messages could be transferred between devices using the integrated USB cable. This was seen as a means of passing along useful information among communities. With device upgrades replacing the USB cable for a mobile application, all content can now be shared over Wi-Fi or cellular signals.

The Talking Book offers the benefits of e-learning through a digital platform that is more inclusive than other technology-enabled devices. Listeners navigate simple audio menus in their local languages to access content of interest to them. This way, learning is self-directed and user-centred. Audio links allow listeners to hear word definitions and respond to multiple-choice questions related to the content they are learning.

The principal programme model provides three layers of support for the end user. At a local level, support is provided through local partner organizations with access to the rural communities where the Talking Book is deployed. An additional level of support provides behaviour change expertise and the capacity to generate new content and some degree of technology support. Support is also provided from the headquarters to deliver ongoing training and monitoring to continuously build capacity for improved programme impact.

LESSON

Encourage whole-community involvement

In the Upper East Region of Ghana, CARE has organized women's groups for training in agricultural practices and nutrition education. The Talking Book complements implementation efforts by providing a platform to deliver follow-up lessons to the training CARE is disseminating to the groups. Therefore, it is not necessary for CARE staff to be physically present at every meeting for participants to receive the key information. Group members rotate possession of the device for home use so that their families can also benefit from the updated content. This approach improves the efficiency of the distribution mechanisms for Literacy Bridge and supports ongoing implementation efforts.

Monitoring and evaluation strategy

The Talking Book technology records usage statistics and user feedback for ongoing process evaluation, while an audio content management (ACM) application transfers data to and from the devices for distribution and analysis. A major emphasis of this strategy is to continue to improve the user experience through ongoing product enhancement.

Monitoring efforts are segmented into four stages: production, deployment, performance and outcomes. Usage statistics and user feedback are automated sources of data captured by each Talking Book device. Data is collected, aggregated and analysed each time new content is loaded on the devices at approximately 3-month intervals.

1 / Production monitoring ensures quality content is consistently developed and appropriately adapted across language groups that adhere to partnership agreements. Once produced, new content is compiled in the ACM and stored into playlists for quarterly deployment to Talking Book devices.

2 / Deployment monitoring tracks the distribution of content to the devices. Information related to number of devices receiving a particular collection of messages, language distribution, dates of distribution and GPS tracking is all collected and monitored. This data helps illustrate the reach of the intervention as well as what content is being distributed. Playlists are uploaded manually to the devices using the Talking Book loader application, and simultaneously usage data and user feedback are downloaded and stored on a cloud server.

3 / Performance monitoring is based on usage data automatically captured by the devices, including frequency and topic selection from the available content. Performance data is evaluated under the assumption that more relevant and engaging messages will be played with greater frequency. Following the theory of change for the Talking Book Programme, the more a message is played, the more likely individuals are to acquire new knowledge, change their attitudes and beliefs about a particular practice, and adopt new behaviours.

FINDING

Message placement and format influence performance

A recent analysis of message placement, duration and format found that earlier messages in a category are played more frequently than later messages, while creative content (songs and dramas) receives more attention than non-creative content (interviews and lectures) (Schmidt, 2015). No differences were associated with message length and performance. As a result of these findings, Literacy Bridge intentionally places the most important messages for a given category in the top three message spots.

In addition to frequency data, performance monitoring includes analysis of user-generated recordings. Language specialists listen to the data provided and code the content by topic and feedback type (question, comment, suggestion or endorsement). A representative sample of feedback data is translated and transcribed. This data is then analysed as a ratio of total user feedback to determine where to focus new production efforts and to progress towards meeting medium and long-term outcomes.



LESSON

Be data-driven

Analysis of performance data might find a message on child marriage to be the most frequently repeated, and listened to completion 95 per cent of the time within a particular content update period. User feedback might further reveal that 95 of 200 user-recorded messages were related to the topic of child marriage, with a majority of those messages inquiring about the availability of funds for girls' education. Literacy Bridge would then use this trends analysis to tailor future production efforts to better align with community interests and partner goals.

4 / Outcome monitoring varies to fit with specific partner objectives. A mixture of qualitative and quantitative data collection efforts is included to monitor outcomes. Of particular interest is identifying knowledge gained as a result of the programme, positive change in attitudes or beliefs, and reported adoption of improved practices. The primary outcome of interest is the percentage of individuals reported moving from the group of ‘undesired behaviour’ to ‘desired behaviour’ during the period evaluated (Literacy Bridge and UNICEF, 2016). Beyond collecting data on behavioural change, Literacy Bridge collects data associated with the underlying factors that may contribute to – or impede – positive change behaviour. In some instances, data is collected quarterly during community monitoring visits to representative samples of users, to inform content strategy, scale or sustainability measures.

FINDING

Messaging to challenge gender stereotypes

‘Before receiving the Talking Book I dared not even talk to my husband concerning men–women relations. At first, he did not show any interest in listening to the Talking Book so I started playing it any time he was eating dinner. He showed a lot of interest in the agriculture aspect. The first day I tuned into the gender messages; he laughed a lot and we argued a lot. The next day he asked to listen to the messages on gender again. We began to discuss how joint decision-making and reviewing the workload can help all of us. I was surprised when he asked our sons to always wash their bowls any time they finish eating.’

– Mary Bognuo, MEDA (2014).



Results to date

To date, the Talking Book has been deployed across four projects in Ghana, Kenya, Rwanda and Uganda, reaching over 400,000 individuals.

Internal midline evaluation results of a Literacy Bridge partnership with UNICEF in Ghana were associated with statistically significant changes in five out of ten key health behaviours evaluated among Talking Book users.¹ Qualitative findings revealed that the Talking Book users viewed the device as a 'health system strengthening tool and a resource for workers in the communities' (Literacy Bridge and UNICEF, 2016).

An external, qualitative evaluation of a 2016 partnership with CARE International assessed changes in knowledge, attitudes or behaviours around farming extension methods, marketing, and gender-related issues among eight communities in Northern Ghana. The findings described regular use of the devices and positive experiences with the content in each of content categories (Turkaly, 2016).

¹ Significant findings were reported on malaria prevention, hand washing with soap, kindergarten enrolment, birth registration and prevention of child marriage.

RESULT

Change in health behaviour in Ghana

In 2016, Literacy Bridge partnered with UNICEF in Ghana to conduct a study of the Talking Book Programme on ten key social and health behaviours over sixteen content deployments. Each household received a Talking Book device which included a collection of messages organized by topic for one week per deployment. The study found 'notable and statistically significant changes in half of the behaviors evaluated'. Results highlighted key health areas associated with stronger improvements in desired behaviours while informing the team's strategy for future content updates. Based on these findings, Literacy Bridge chose to feature more content on areas with less improvement.

Source: Literacy Bridge and UNICEF (2016).



Sustainability and future plans

In Ghana, per-minute costs of voice calls are more than the entire costs of the Talking Book Programme, including content creation.

Since the devices track key usage statistics, Literacy Bridge can accurately estimate programming costs. The entire project budget (including planning, design, content creation, deployment, training and evaluation) typically costs US\$0.01–0.05 for every minute of content deployed. This bottom line could be even lower considering that the content is often listened to by two or more people at a time. While Literacy Bridge continues to experiment with revenue-generating business models, approaches involving a paid access to content have been associated with a drop in user engagement.

Literacy Bridge is investing in a plan to scale its reach from nearly half a million up to 10 million users by 2022 through a network of local country partnerships. In 2017, the organization began to develop an affiliate model to promote expansion and quality control.

Within this affiliate model, Literacy Bridge identifies established local organizations in new countries that have a proven track record of providing behaviour change communication to rural communities. Organizations that are motivated to introduce the Talking Book Programme are trained and supported remotely by Literacy Bridge using the same procedures, tools and standards as the other Talking Book Programmes. New organizations benefit from a network of other affiliates with institutional knowledge of best practices and content outlines. When affiliates update Talking Books with new content, usage statistics and user feedback data are transmitted for analysis by Literacy Bridge. Affiliates and their partners are then

provided with recommendations about new content trends. Ongoing collaboration with the network of affiliates allows Literacy Bridge to constantly monitor performance measures across countries to ensure the overall quality of the programme.

Literacy Bridge also has plans to upgrade certain features of the Talking Book device. Currently, standard disposable batteries are a common source of power for the devices. A new feature that Literacy Bridge is adding into the Talking Book is an optional rechargeable battery for those communities that have solar or other sources of electrical power.

The company is also addressing the technology needs of its partners by developing more efficient and accessible ways of updating and managing content, and monitoring data through online dashboards.

Finally, Literacy Bridge has just released the first version of an Android-based app to load and retrieve usage statistics and user feedback from Talking Books. The application downloads the latest content when there is network connectivity for later access through the USB cable. Once connected to a device, the application also uploads and stores usage statistics and user-generated recordings that are then transferred to a cloud server when the phone reconnects with a network. The app not only allows for more efficient updates of programme content, it also provides GPS mapping of nearby communities and notifies staff of their content update needs. Together, these feature updates will provide a more cost-effective means of monitoring and evaluation.

Lessons learned and recommendations

Lean startup. Literacy Bridge is a firm believer in a lean startup methodology. This means that it only develops as much of a product or service as is needed before it gets direct feedback from its partners.

Understanding the problem and the context. Before any technology was designed, Literacy Bridge spent months working to gain a deep understanding of the problem it was trying to solve through extensive field-based research. This process led to a reframing of the project focus, with a better understanding of the barriers to information access among low-literacy populations.

Iteration with technology. A key lesson from the work is that implementing with technology is an iterative process that must undergo pilot trials. This was apparent in the evolution of the Talking Book icons and the colour scheme of the devices.

Planning for scale. The affiliate model that Literacy Bridge deploys ensures local capacity development while enhancing sustainability overall. The network of regional affiliates provides local implementing organizations with the resources they need to successfully scale the Talking Book model.

Evidence-based planning. Governments have an opportunity to ensure that their most underserved citizens protect themselves from preventable disease, improve their economic opportunities and follow productive farming practices. To achieve these goals, Literacy Bridge recommends that governments and industry make technology-enabled programme investment decisions based on evaluation data and cost-effectiveness comparisons that are most relevant to the communities they are trying to support.

LESSON

Appeal to
the emotions
of the end user

When designing the audio book, Cliff Schmidt, Founder and Executive Director, Literacy Bridge, wanted to know what would be the best colour for the device. 'People told me "Give us choice". It was one of the times in those early days when I realized that the best approach to development is to appeal to joy and fun within the consumer and not be too utilitarian about the mission.' The Talking Book now comes in a range of vibrant colours.

Contact information

Literacy Bridge is a non-governmental organization focused on improving the health, income, and quality of life for underserved communities by providing practical education through technology.



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www.youtube.com/user/literacybridge

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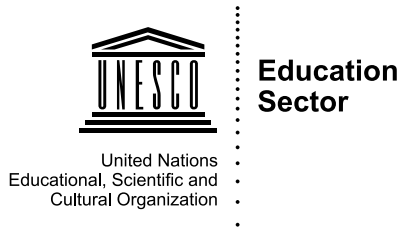
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UNESCO Education Sector

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UNESCO, as the United Nations' specialized agency for education, is entrusted to lead and coordinate the Education 2030 Agenda, which is part of a global movement to eradicate poverty through 17 Sustainable Development Goals by 2030. Education, essential to achieve all of these goals, has its own dedicated Goal 4, which aims to *"ensure inclusive and equitable quality education and promote lifelong learning opportunities for all."* The Education 2030 Framework for Action provides guidance for the implementation of this ambitious goal and commitments.



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About Project Literacy

Project Literacy is a global campaign founded and convened by Pearson to make significant and sustainable advances in the fight against illiteracy so that all people - regardless of geography, language, race, class, or gender - have the opportunity to fulfill their potential through the power of words.



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