



mHero: Video and Gamification Integration Options

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¹ Image: Health workers in Nigeria study content on mobile phones. Photo Credit: Karen Kasmauski/MCHIP

Introduction

mHero is a mobile platform that combines existing systems for rapid SMS communication with health workers². Based on mPowering's expertise in adapting, creating, and deploying mobile training programs for health workers, we feel that there is a high potential for mHero to integrate training into its existing functionality. mPowering's ORB platform³ hosts and aggregates training materials that can be used by health workers, and all content referenced in case studies in this document is available on the ORB site.

This document describes the possible options available for the distribution and delivery of video training content, how it could be integrated into mHero, and finally what the options are for adding gamification. These are presented separately, but it should be noted that options taken for the distribution and delivery method will have implications in the options for mHero integration and gamification.

The assumptions made in this document are that health workers:

- will have some form of mobile data connectivity, but this is likely to be erratic, slow and/or expensive;
- will not have sufficient connectivity to download or stream video content using a mobile data connection;
- will not have access to a Wi-Fi connection;
- will have access to an Android device - either phone or tablet – which may be owned by them or shared with others, or they have other regular access to this type of device; and
- should be able to view the video at any time (so options such as community screenings of videos have been deliberately excluded).

Based on mPowering's experience delivering training materials to health workers in low-resource settings, these assumptions represent elements that are likely to be in place in areas where mHero will be used.

² www.mhero.org

³ Health-orb.org

Video Distribution and Delivery

This section describes the potential options for getting video/media content into the hands of community health workers. Video and multimedia content allows for training to be delivered effectively via mobile devices. Video may be especially useful for skills and competencies which are difficult to describe and present simply by text or static images and/or where hands-on practical sessions may not be feasible due to lack of skilled trainers or resources.

Video content may help to overcome literacy issues and, in comparison to in-person presentations, be a resource that health workers would watch repeatedly. Results from the case studies below also show that health workers very often share and show video content to colleagues, friends and relatives in a way they don't tend to do with text/workbook based training content, allowing much broader reach than may be otherwise possible.

Case Study 1: The Nigerian Reproductive Health Initiative used videos, distributed directly to devices, to provide training on reproductive health and counseling skills for health workers. The program has observed improved skills, knowledge, and practices in health workers who used the videos.

We have assumed that existing video resources may be re-used or adapted (eg dubbed into local language) rather than created from fresh. Creating good quality video that demonstrates best medical/clinical practice can be time consuming and costly to produce⁴. Adapting existing content to make more applicable to a local context (most notably into local languages) is much cheaper and quicker than creating original content. A large amount of quality health training content already exists and may be used as-is or dubbed/translated. For example, mPowering's ORB platform hosts more than 300 resources for training health workers via mobile devices; many of these may be freely adapted to new languages or contexts.

⁴ Based on quotes from content developers, a short animated video may range from \$10,000 - \$25,000 and upwards to produce.



Case Study 2: In Ondo State, Nigeria, mPowering, Medical Aid Films, and InStrat used a video based training package for training nurses, midwives and community health workers. This training was loaded onto tablets, which are kept at health facilities and shared by staff. This training was adapted from existing films, which were shorted for mobile viewing, and later translated into local languages. Uptake and interest from both the trainees and health managers has been very positive, with plans for rapid scale up only a few months after launch.

Image: Health workers study training materials on a shared tablet.
Photo courtesy of InStrat Global Health Solution

There is an important distinction between distribution and delivery methods:

- Distribution method refers to how to get the video content to the health worker - in terms of getting a large video file onto a device that the health worker can then view
- Delivery method refers more to how the video content is integrated into the health worker's ongoing professional development (e.g. as part of a structured course)

There is a link between distribution and delivery method. For example, using a delivery method such as mobile learning platform will still require a distribution method such as distributing via SD card, or pre-loading the videos onto the health workers' devices. In each option presented, there would need to be some form of local support to help get the videos to the health workers and deal with any issues related to the devices and the online content. Many of the options may be implemented together, for example 1 & 2, where content could be provided on an SD card to a small number of health workers (or their supervisors), who then pass this on to their colleagues via Bluetooth.

Table 1: Options for Distribution of Video Content into mHero

#	Description	Pros	Cons	Examples
1	<p>Distribute on SD card Provide an SD card (or USB stick) with the videos preloaded, for the health workers to copy onto their phones - or the videos are copied onto their devices for them</p>	<ul style="list-style-type: none"> • Low-tech • Cheap and straightforward • Could share with users on lower end feature phones (assuming the correct video format is used) 	<ul style="list-style-type: none"> • Very unstructured, essentially would be organized by the filename and/or directory structure • Will make evaluation very difficult • Not possible to track how many users are copying/watching 	<p>Several projects have used this approach. For example it was the initial approach used by Project Ujwal in India, and has also been used by the English In Action project in Bangladesh. Also in India, Simavi used an SD-card based distribution for video content.</p>
2	<p>Peer to peer sharing (Bluetooth) Share the videos onto a few users' devices (as with option 1 above), and they can then share these using Bluetooth, WhatsApp or another method to their colleagues.</p>	<ul style="list-style-type: none"> • Similar to SD card distribution, but only need to provide the content on a much more limited number of devices to start with. 	<ul style="list-style-type: none"> • Not possible to track how many users are copying/watching • Very unstructured, essentially would be limited by the filename and/or directory structure • Could have extra demands on technical support (e.g. issues connecting particular devices and video formats) 	<p>Unclear if this has actually been used formally, likely this might have happened 'organically' as users share music and other video clips in a similar manner.</p>
3	<p>Broadcast via Outernet (or similar) Outernet is a system for broadcasting content to local devices (e.g. in a health center/clinic), that users can then connect to via a Wi-Fi signal created by Outernet to obtain content.</p> <p>There are many other types of platforms such as this (internet-in-a-box type initiatives), although Outernet is the only one we've seen that allows the remote updating of content.</p>	<ul style="list-style-type: none"> • Content can be updated remotely • Provides space for additional content (news, Wikipedia etc) that the general community could use • Health workers not formally included in the program would also have access to the health information 	<ul style="list-style-type: none"> • Would need some technical set-up and support in country (e.g. at a health center) • Tracking information will be limited • Outernet is broadcast only (not 2-way) 	<p>mPowering is working with Outernet to set up some instances in Uganda and Nigeria.</p>

4	<p>Mobile Learning Platform (OppiaMobile) Use a dedicated mobile learning platform to deliver structured courses</p>	<ul style="list-style-type: none"> • Content can be structured into specific courses or topic areas to ease navigation • Additional learning content around the videos can be added • Could get a lot of tracking information and has point/badges/gamification already built-in 	<ul style="list-style-type: none"> • Would require some technical set-up and the videos/content still needs to be copied onto the devices 	<p>App already being used in Ethiopia, India, Nigeria, Ghana, Pakistan.as described in all the case studies in this document</p>
5	<p>Build into data collection/patient management app Data collection tools that use xforms (products based on ODK, such as CommCare) can have video content</p>	<ul style="list-style-type: none"> • User may already be using data collection apps 	<ul style="list-style-type: none"> • Would require some technical set-up for creating the forms and still the videos/content needs to be copied onto the devices • Unclear how users may be able to go directly to a specific video, the forms are usually set up in a very linear fashion • May still be difficult to evaluate/track who has actually watched the video 	<p>IntraHealth developed mSakhi in Uttar Pradesh to deliver health messages and training using the CommCare platform.</p>

Integration with mHero

Integration of video content into mHero would allow Ministries of Health and other users to send video or other mobile content to health workers. This could be used as stand-alone content, such as refresher training sent on a quarterly or other basis. It could also be used to supplement queries or messages sent through mHero – for example, to demonstrate a skill that health workers may need to use the information in an mHero message.

There are opportunities for integrating video distribution into mHero workflows. For example, if a health worker indicates in a workflow that they would like more training on family planning counseling, the workflow could include a link to a video of training content that is already in existence on ORB⁵.

For each of the delivery and distribution options, we describe how this could potentially integrate with the mHero workflows and messaging (Table 2). In each case we assume that the mHero workflow would direct the health workers to a specific video - although in some cases it could also direct them to a different type of learning resource, depending on the chosen delivery and distribution option.

There are differing levels of possible integration. At a ‘loose’ level it would simply involve telling the user in the mHero workflow to (e.g.) “Now watch the video about breastfeeding”; so essentially the workflow is just pointing the user in a particular direction. A ‘tighter’ level of integration could have a much more structured set of videos (or other content such as quizzes) linked to mHero workflow(s), and directly launching the video content from the mHero workflow message.

⁵For examples of family planning materials on ORB: <http://health-orb.org/tag/view/family-planning>

Table 2: Options for Integration of Video into mHero

#	Distribution Method	Integration Options
1	Distribute on SD card	[Options 1 and 2 presented together as the integration options are essentially the same]
2	Peer to peer sharing (Bluetooth)	<p>This would allow only very loose integration, where the mHero workflow would direct a user to go and watch a particular video, which would then be stored separately on their device. The mHero message would not be able to link directly to or launch the specific video on the device, as there's no way to know even whether the user has stored the video on the device, under which filename or in which folder.</p> <p>It would not be possible to track or check whether the user had actually watched the video or not. Any checking of this would need to be self-reported by the user (e.g. by replying in the mHero workflow that they have watched a specific video), which would require extra steps on the part of the user and would not necessarily be reliable.</p>
3	Broadcast via Outernet (or similar)	The option here is very similar to 1 & 2, the slight difference is that it may be possible to get some (limited) usage information from the Outernet platform, but it would be a manual process to link this back up to mHero data (essentially the data would need to be manually retrieved from the Outernet Lighthouse box).
4	Mobile Learning Platform (OppiaMobile)	<p>It would be possible to include a link in a mHero workflow SMS that would directly open a video/quiz or other activity in OppiaMobile . This would require a small amount of technical development in the app to make this happen⁶.</p> <p>There may also need to be some technical development on the server side to link up the data stored by mHero with the data in the mobile learning platform - for example for reporting and data analysis.</p>
5	Build into data collection/patient management app	Similarly to the option of a mobile learning platform, this method could be implemented in other Android apps (to launch directly from an mHero workflow SMS), but much will depend on how the data collection app is structured. The downside to this approach is that it essentially forces the data collection app to perform a function that it's not designed or optimized for.

⁶<http://stackoverflow.com/questions/3086774/launch-android-app-from-within-sms-mms-message>

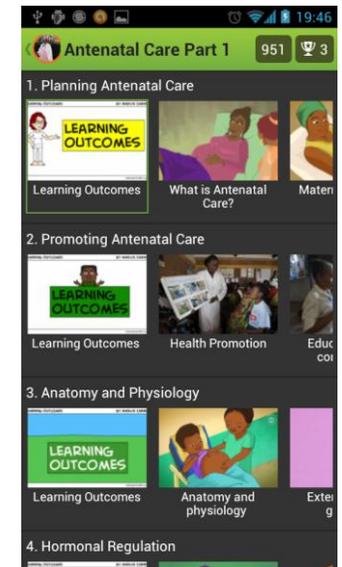
Gamification

Gamification refers to the use of elements of game design outside game settings or contexts.⁷ Gamification is often used to make users more engaged, to improve productivity, and to facilitate learning. It has been applied to commerce, education, health, and other social settings. A review found that gamification can lead to positive results in learning and behavior change, though contextual factors influence results⁸.

Gamification for health is a relatively new idea in low-resource settings, with a few notable exceptions such as the Hello Nurse app by Leti Arts in Ghana⁹ which is a fully interactive story game developed in collaboration with USAID's Maternal and Child Survival Program to help train community health workers in malaria prevention, diagnosis and case management. Gamification covers a broad spectrum of approaches, from highly interactive educational games (such as Hello Nurse) through to rewarding learners with points and badges as they progress through course content (for example Khan Academy and DuoLingo). Experiences even with basic forms of gamification, show that health workers will compare scores and progress with each other, helping to increase engagement with the training content by adding a dimension of friendly competition between users.

Case Study 3: OppiaMobile uses points and badges to help gamify learning content. Users of OppiaMobile earn points for taking quizzes and watching videos, and they also earn extra points for regularly repeating learning activities. Badges are awarded once a course has been completed and all the quizzes passed. Community health extension workers in Ethiopia using OppiaMobile in their upgrade training regularly compare their points and scores with each other, providing additional motivation to participate in training.

Image: Example of OppiaMobile user interface. Courtesy of Digital Campus.



⁷ Sebastian Deterding; Dan Dixon; Rilla Khaled; Lennart Nacke (2011). *From game design elements to gamefulness: Defining "gamification"*. Proceedings of the 15th International Academic MindTrek Conference. pp. 9–15.

⁸ Hamari, Juho; Koivisto, Jonna; Sarsa, Harri (2014). "Does Gamification Work? – A Literature Review of Empirical Studies on Gamification". *Proceedings of the 47th Hawaii International Conference on System Sciences, Hawaii, USA, January 6–9*. doi:10.1109/HICSS.2014.377.

⁹ https://play.google.com/store/apps/details?id=com.leti.letiframework.mcsp_hellonurse

Badging and Points

Gamification covers a very broad set of concepts. Fully interactive educational games - the educational equivalent of video games - generally require significant resources and effort to develop, and may only focus on a very specific skill/knowledge area. Simpler forms of gamification, such as points and badges are more straightforward to implement and may be applied on top of existing content and applications. For these reasons, here we focus on more basic forms of gamification.

In general, points are used as a measure of learner engagement/activity, so they may be awarded very often and for completing very simple actions (for example, watching a video). In contrast, badges are generally used as a measure of attainment and indicate the learner has reached a particular level. The number points could be compared to the number of times a student has attended a class, and the badge could be compared to the certificate they receive for passing the exam. Different platforms and systems will use points and badges in different ways, for example the StackOverflow¹⁰ website uses points and badges for users to recognize who is knowledgeable on particular technical topics whereas Duolingo¹¹ uses points and badges to help motivate language learners.

Badging is usually used in a similar way to giving certificates, in recognition of attaining a particular skill or course result. Badges can then be used to prove a competency or skill. Until recently digital badges usually only had any meaning within the particular app or platform they were awarded by. However with the introduction of OpenBadges (see Annex), digital badges can now be shared and, crucially, verified against the awarding organization¹².

For each of the delivery options, we describe how gamification could be incorporated (Table 3).

10 StackOverflow website. <http://stackoverflow.com/>

11 Duolingo. <https://www.duolingo.com/>

12 Penn State Educational Gaming Commons. <http://www.gaming.psu.edu/gamification/digital-badges/>

Table 3: Integration of Badging and Points into mHero

#	Distribution Method	Gamification Options
1	Distribute on SD card	[Options of 1, 2 and 3 are presented together as the options are essentially the same]
2	Peer to peer sharing (Bluetooth)	Given that it wouldn't be possible with any of these options to track usage of the videos (or at least very difficult), this would then also make it very difficult to then award points/badges - unless it was based on health worker self-reported video views. The only real option here would be to build the gamification directly into the mHero platform, and have the platform award points/badges, therefore it would require technical development in the systems and platforms that make up mHero..
3	Broadcast via Outernet (or similar)	
4	Mobile Learning Platform (OppiaMobile)	
5	Build into data collection/patient management app	This would likely need fairly significant technical development, as with the integration with mHero, it's using a data collection app for a purpose it's not really designed for.

Conclusion

There is a high potential to integrate training materials and gamification into mHero. By combining training materials with its existing functionality, mHero could provide a comprehensive source of training, information, and communication for health workers in low-resource settings.

For any recommendation on the approach that could be taken by mHero, much depends on what the future development/implementation path of mHero may look like. If only looking at the short-term, then simply distributing the video files via SD card is the simplest/easiest approach. However, this means losing the opportunity for close integration and gamification. If looking longer term, and linking in formal health worker training programs, with richer and more structured content than can be delivered by mHero on its own, then a mobile learning platform may be a more appropriate approach.

In the annex, we have included some potential future technical and standards integrations the mHero team may wish to consider in their ongoing development of the mHero platform, which would add value and help to future-proof the mHero platform.

Annex: Ideas for Future Directions

Integration of mobile phone and learning platforms has a lot of potential, especially as more mobile users across the world are transitioning to smart phones and tablets. The table below lists some potential future technical integrations that mHero implementers may wish to consider, especially if moving towards more formal/structured course delivery using mobile devices. All of these tie in well with existing platforms, such as the OppiaMobile learning platform and OpenHIE.

Technology/Standard	Description	Why is it useful for mHero?
xAPI (sometimes also referred to as TinCan API)	xAPI is an open standard for recording and sharing learning experiences (in the form “I did this”).	<p>This standard is one of the likely interoperability standards that could be used in HIS interoperability, for recording and sharing the learning experiences of health workers.</p> <p>The mHero platform, with any learning/training type workflows, could then also feed in learning experiences to a learning record store using xAPI.</p> <p>In work with OppiaMobile and with the Jhpiego ICT4D team, mPowering is starting to look at how this standard could be implemented.</p>
OpenBadges	OpenBadges is an open standard for recognizing and verifying learning. OpenBadges can be shared and the data contained in them means that the badge can be verified against the organization that provided the training/assessment.	<p>As with xAPI, OpenBadges could also be one of the standards used in the HIS interoperability proposal</p> <p>With training/learning workflows, and linked to verified completion of learning activities, mHero could award OpenBadges to health workers.</p>
Telegram	Telegram is a messaging platform similar to WhatsApp. The key differences between Telegram and WhatsApp are (1)	OppiaMobile has been looking at how Telegram could be integrated, for example to support teacher-student or

	<p>Telegram app is open source - meaning that it can be integrated into other apps and (2) Telegram has an API - so (for example), groups of users and/or message threads can be automatically be created.</p>	<p>student-student communication.</p> <p>Telegram could also be used as a supplement, or alternative, means of communication for the mHero workflow messages - for those who have capable devices.</p> <p>Building out the mHero platform to use these types of data-connection based communication tools (rather than only SMS) could help to future-proof the mHero platform, as well as allowing more sophisticated uses.</p>
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