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FACULTY OF EXTENSION

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AN INTRODUCTION TO TECHNOLOGY STEWARDSHIP FOR AGRICULTURAL COMMUNITIES OF PRACTICE

TRINIDAD & TOBAGO
MALF NORTH REGION CASE STUDY

CASE STUDY BOOKLET

This is a fictional case study created for training purposes only. Names, characters, businesses, places, events, locales, and incidents are either the products of the author's imagination or used in a fictitious manner. Any resemblance to actual persons, living or dead, or actual events is purely coincidental.

Contributors:

Gordon A. Gow, University of Alberta
Chandana Jayathilake, Wayamba University of Sri Lanka
Wayne Ganpat, University of the West Indies
Ataharul Chowdhury, University of the West Indies
Jeet Ramjattan, Ministry of Agriculture, Trinidad & Tobago

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Key Terms

Technology Stewardship

Technology stewardship is a leadership role that almost any practitioner can assume. In this role, a technology steward is someone who works with a community of practice (COP) to encourage the adoption and use of digital technologies for communications, training, and knowledge transfer.

Technology Stewards need to know how to engage their community members to identify opportunities and challenges; they need to be able to acquire and configure appropriate digital information and communication technologies (ICT) platforms to support innovative practices; and they need to be able to evaluate and report the outcome of their efforts back to the community and to organizational sponsors. Technology stewardship is not the same as 'IT support'. It is a leadership role intended to help members of a community of practice to better understand and make informed choices when incorporating ICT for communication and knowledge sharing.

This course is designed to introduce you to a leadership strategy that will help you understand and assume the role of a technology steward with their COP. The course sessions will present a process and set of activities that will equip you with the means necessary to analyze the communication challenges facing a COP, identify and assess a range of technology choices to address those challenges, and undertake an exploratory campaign to respond to those challenges using low cost ICTs.

The medium range goal of implementing a Technology Stewardship program is to promote experimentation with digital ICTs, and to build capacity for innovation within a community of practice. Technology Stewards should aim to cultivate a culture of innovative thinking among their community members with the long term objective of enhancing the range of real choices available to practitioners when it comes to sharing information and mobilizing knowledge with digital ICTs.

Livelihood Communication

'Livelihood communication' refers to many types of interaction that take place between people about the activities and demands of work life. Examples range from scheduling meetings, sharing techniques or new methods, or sharing vital information about the marketplace or changes in government or administrative requirements. While these interactions often include casual personal exchanges, livelihood communication has a central purpose to share information and knowledge in order to support learning and work-related decision making.

Stewards talk to their community members to identify priority needs or concerns related to livelihood communication and its challenges. They then select and introduce practical, affordable

technology to address these challenges through an intervention called a campaign. Campaigns begin as limited duration, small-scale interventions intended to achieve a specific objective in relation to the community priority. Over time, a campaign might evolve into a sustained use of ICT and the emergence of new communication practices but this is not the only measure of success.

A Technology Steward is successful if he or she can raise awareness of possibilities with ICTs and expand the range of choices community members consider when responding to challenges related to livelihood communication. The Tech Steward's role is shaped by four primary responsibilities with regard to using ICTs for livelihood communication:

- Make the community aware of the existence of choice;
- Help the community to develop a clear sense of choice;
- Facilitate and support the effective use of choice;
- Recognize and sustain the achievement of choice.

Communities of Practice

An important aspect of livelihood communication is sharing information that will help us to improve our practices, to improve outcomes, and therefore contribute to the overall improvement of our situation; in other words, to sustain and improve our livelihoods. When we share information of this type, we are taking part in a learning experience. In other words, the need to exchange information for the purpose of learning is an important motivator for livelihood communication.

A group that comes together to share information for purpose of learning is also known as a community of practice:

> *Communities of practice are groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis.*
>
> -Wenger E., R. McDermott, W. Snyder (2002). Cultivating Communities of Practice. Harvard Business Press. (p. 4)

When we talk about community in this course/workshop, we generally mean Community of Practice as defined here. We can abbreviate the term to COP. Practitioners can be (and often are) members of more than one COP.

Campaign

A Tech Steward helps the community to choose and try out new ICT practices through an intervention we call a 'campaign'. A campaign is a limited duration ICT trial. It requires a well-defined objective related to a specific activity of importance to a COP.

A campaign consists of three core activities:

- Community engagement and priority setting
- Technology acquisition, rapid prototyping, and piloting
- Campaign management and evaluating outcomes

The Tech Steward must work closely with their COP to identify its needs and challenges, and to help prioritize these when choosing a focus for the campaign. The key to success is a well-defined objective that responds to a need identified by the community members. The guiding principle here is *Vision before technology*.

Low Cost ICT

A low cost ICT is one that is affordable and practical for a COP. Technology stewards are encouraged to use ICT devices, tools, and platforms that are already available to community members (e.g., mobile phones, SMS, social media) and to enhance the value of these ICTs by exploring how they can support livelihood communication more efficiently and effectively. In some cases, the Tech Steward and the community might try an unfamiliar ICT if it seems like a good fit. In all cases, however, the guiding principle is *keep it simple and affordable* for the community.

Rapid Prototyping

Technology stewards play a key role in implementing new practices with ICTs through a process of trial and error with quick turnaround times. Testing and refining an ICT tool or platform quickly helps to keep up interest and momentum, reduces costs, and provides immediate feedback on the design of the system in order to assess its value for the COP.

Evaluation

When leading a campaign, a Technology Steward is responsible for managing the overall process and evaluating the final outcome. Responsibility is divided into three basic phases: pre-campaign, mid-campaign, and post-campaign. In addition to their own role, stewards must also be mindful of three other important influences on a campaign: (1) support of the sponsor; (2) community readiness; (3) suitability and reliability of the ICT tool or platform. Campaign management and outcome evaluation is based on a simple plan that the steward develops and implements as part of the pilot. At the end of a campaign, the Tech Steward reports the results back to the community members and to the sponsoring organization, with results informing the decision about next steps. The guiding principle here is to *understand failures and build on successes*.

Preparing to be a Technology Steward

Sometimes individuals take up the leadership role of Technology (Tech) Stewards on their own initiative without having any specific training for it. That is perfectly acceptable, and we have seen this before in our research in Sri Lanka as well as other places. However, the goal of this short course is to provide you with some basic training in the strategy and techniques of Technology Stewardship should you decide this is type of leadership would benefit your COP.

It is important to be aware that this is a pilot course and part of an ongoing action research project to better understand how to encourage appropriate adoption and use of ICTs in various communities of practice. Your participation in the course will provide us with important lessons about your experience as a member of a COP, the course curriculum, training materials, and course format. We appreciate you taking time to contribute to this research but, more importantly, we hope that you will find the course helpful in your own work.

Case Study: UWI and MALF North Region

The following case study is a fictional account about a COP in the Ministry of Agriculture Land and Fisheries (MALF) North Region of Trinidad & Tobago. The details in this case study will be used in the first session of the Technology Stewardship Training Course to introduce you to the principles and practices of this important leadership role.

Figure 1: Training session for MALF

PART A

The Community of Practice

The Ministry of Agriculture Land and Fisheries provides extension services to agro-ecological areas organized into the North and South Regions and the Extension Training and Information Services Division. Tobago is divided into East and West Divisions of the country. The primary extension service provider is MALF together with state owned institutions.

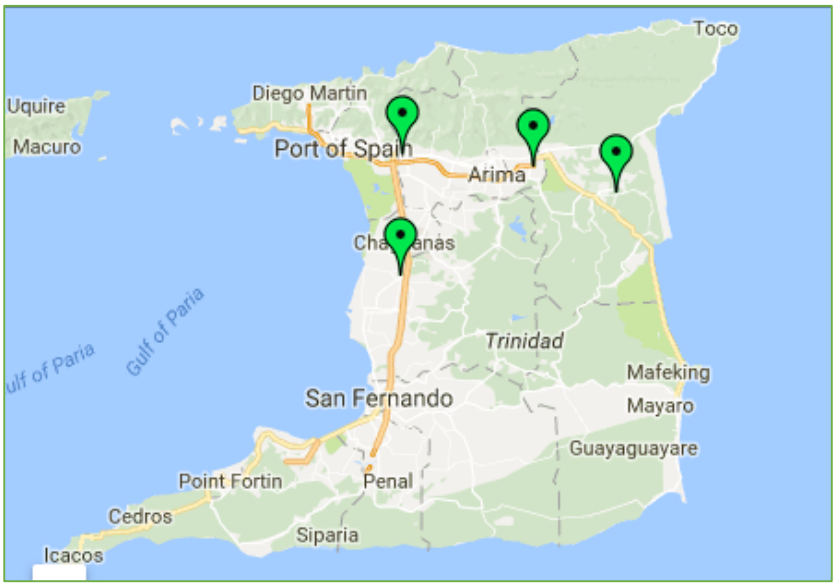

Figure 2: Community locations North Region

Some of the significant agricultural and ecological related problems in the North Region Counties of Trinidad include

- Limited rainfall leading to water scarcity during the dry season;
- Slash and burn agriculture leading to flooding in the rainy season;
- Land tenancy issues, change in land use policy (urbanization) and squatting;
- Poor access to credit due to non-regularization of land tenancy;
- Pesticide misuse, gaps in pesticide legislation and a failure to operate at international levels which prevents export of local produce;
- Difficulties in managing invasive species;
- Ministry staff shortages;
- Lack of programme funding.

The district also faces a number of economic and social challenges that include

- Poor infrastructure – poor road facilities, drainage, flood mitigation infrastructure;
- Inadequate market facilities;
- Officers from the MALF cannot reach certain parts of the area easily with limited allowance for fuel and transport;
- Poor market access/opportunities;

- Farmers ability to use mobile services;
- Labour shortages - competition from construction industry and other social programmes;
- Aging farmer population, lack of incentives to attract youth in agriculture;
- Farmers health issues - Heart disease, diabetes, cancer and other lifestyle diseases;

While this area could be defined as a community by its geography, it is also comprised of several possible COP. Farmers in this area have a shared interest in and commitment to livelihood communication in several domains: type of crop, region-specific issues listed above, and as farmers generally. The important consideration is the shared domain of interest around which people share information and learning through livelihood communication.

In this case study, vegetable farmers in St. George West County-Orange Grove District form a COP. However, different types of farmers from Maloney or Wallerfield with common concerns (e.g., water management or market access) might belong to their own COP. A group of extension officers or advisors serving the North Region Counties might even form a community of practice. It is possible for a farmer or extension officer to be a member of several communities of practice at the same time, with overlap between them.

Communities of Practice can have physical (face to face) or virtual (ICT-mediated) presence. Often they include both types of presence, combining face to face interactions enhanced with a set of ICT tools and platforms. We can refer to this collection of ICT as the *digital habitat* of the community of practice.

Go To Worksheet 1.1(a)

PART B

Identifing Priorities for the Community of Practice

The MALF-North Region (St. George East and West Counties) working closely with the Orange-Grove/ Arouca District and in collaboration with UWI organized a farmers meeting to discuss how new uses of ICT might provide benefits to the COP. During the meeting, they identified a priority need for improving the timeliness and frequency of communication between MALF Extension Officers and their beneficiary farmers.

An ongoing challenge for this community of practice is the small ratio of extension officers to farmers who are responsible for fulfilling administrative/regulatory functions, combined with the demands of travel. Using ICT to exchange short messages can reduce travel costs and improve the efficiency of carrying out certain administrative requirements for both officers and farmers.

Figure 3: Community meetings in the Orange-Grove/ Arouca District

At the meeting it was decided to look into an ICT tool that might help to improve general messaging regarding farmer group meetings, incentive programmes, farmers' registration, flood damage incidents and assessment, Agricultural Engineering consultations and provision of expert agronomic advice.

PART C

ICT Choices in the Community

More than 90 percent of vegetable farmers in the Arouca district use a mobile phone for communication in their day-to-day life. Many farmers possess smart phones and have internet access at home, and many are comfortable using text messaging (SMS) or popular software applications ('apps'), such as Facebook or WhatsApp. This opens the possibility that the mobile phone and popular apps might be an appropriate and effective ICT choice for exchanging messages within this COP.

***Go to Worksheet 1.1(*b)**

PART D

Community Orientation and Campaign Objective

At the community meeting, both the Extension officer and community members agreed that the most important need was to improve communications for scheduling meetings and providing the community with updates on other gatherings. Secondary needs that were raised during the meeting included finding a faster, more efficient way to access expertise by contacting the Extension officer with questions about pest management, diseases, or cultivation techniques. The Extension officer also indicated that it would be helpful in some instances to be able to reply with a single answer back to the whole group rather than on an individual basis.

The next step in the process was for the Tech Steward to work with the community members to formulate a clearly-worded campaign objective based on the identified priority. In this case the objective was worded as follows::

> *We need to find a way to improve the timeliness and reduce the cost of exchanging messages between the extension officer and community members when scheduling meetings and responding to inquiries about crop management for vegetable farmers in St. George County .*

This was a well-defined campaign objective because it includes three important details:

- it sets a specific target (improve timeliness and reduce costs);
- for a specific activity (exchanging messages for scheduling meetings and responding to inquiries);
- with a clearly defined COP (vegetable farmers in St. George County).

Go To Worksheet 1.2

PART E

Choosing a Technology and Rapid Prototyping

After the steward and the community identified the key priority and campaign orientation, the next step was to choose an ICT tool that could support the primary activity of the campaign (exchanging short messages between the extension officer and farmers).

The Extension Officer (acting as the Tech Steward in this case) consulted with the community and decided to plan a campaign plan using the group messaging feature of the popular platform WhatsApp. The University of West Indies provided MALF and the Technology Steward with some basic training on the platform. The next step for the Tech Steward was to work with a graduate student from UWI to implement the messaging pilot using WhatsApp in a process called rapid prototyping (Figure 4).

Figure 4: Rapid prototyping exercise with UWI and MALF community group in Orange Grove

When planning a campaign, the Tech Steward needs to understand how the the primary activity contributes to the life of the community. In this case, the community of practice felt they needed an easier way to interact with the Extension Officer to make it easier to exchange information while reducing travel demands. The community did not want to replace the community dynamic of face to face meetings but to use ICT to enhance and extend the possibility of sharing information more frequently. The campaign objective was therefore *to improve the timeliness and reduce the cost of exchanging messages between the Extension officer and community members.*

A campaign can involve complex information exchanges but it may help to simplify the planning process by considering four basic types of interactions that ICT tools can support:

1. participation in conversations and activities;
2. creation, storing, and sharing of documents or audio-visual media;
3. real-time (synchronous) communication;

4. post & wait (asynchronous) communication.

ICT tools can also be divided into those that support individual interactions versus those that support group interactions.

We can then use a Tools Landscape graph (figure 5) to better see how each type of tool aligns with the campaign objective and contributes to either reinforcing or changing the community dynamic:

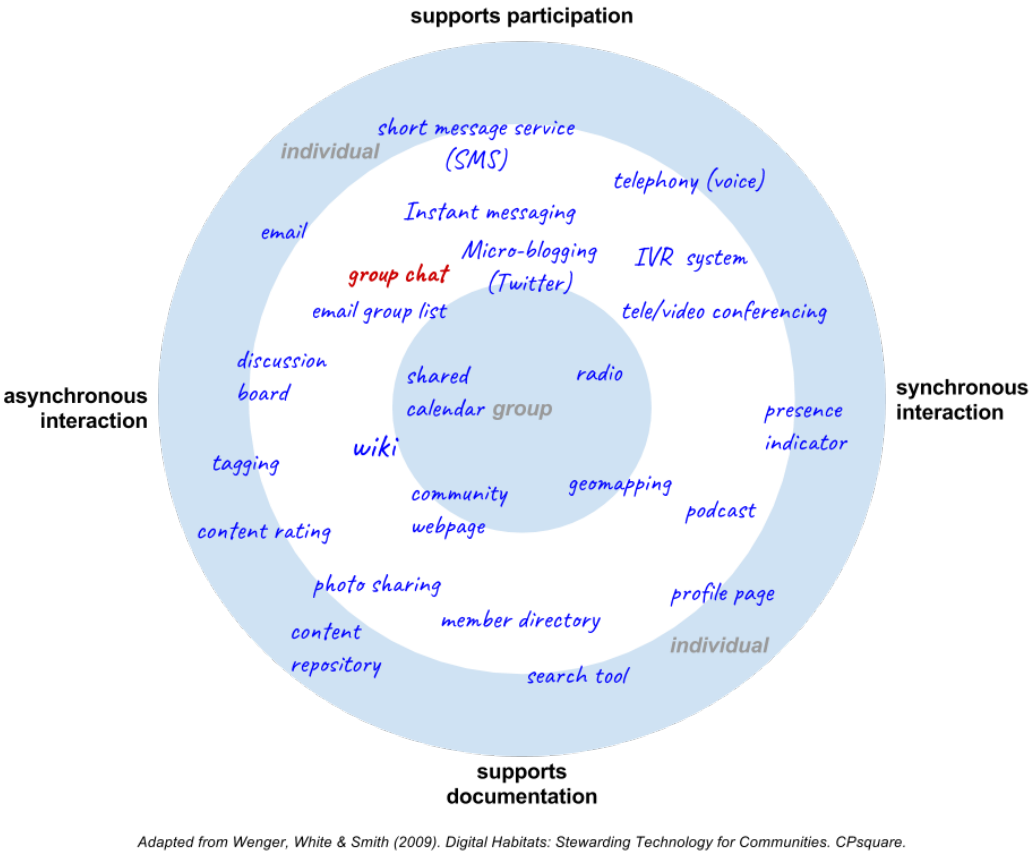

Figure 5: Tools Landscape Graph

Because it was the first campaign with this COP, the Tech Steward decided to focus specifically on one primary activity. Campaigns can involve multiple activities but are more complicated to plan and difficult to evaluate.

In this case, the primary activity (messaging) needed an ICT tool that could support asynchronous participation between the Extension officer, individuals, as well as the group as a whole. The Tools

Landscape chart helped the Tech Steward brainstorm ideas and to choose an appropriate ICT tool. It was felt that an email group list would be too cumbersome and that a group chat tool would be easier to use, especially on a mobile phone.

Having chosen the ICT tool, the Tech Steward then discussed with the community the essential features that the tool should include:

- The community members want to be able to interact on an individual basis with the Extension officer;
- The community wants to be able to interact as a group with the Extension officer;
- The community wants to manage who has access to the group messaging tool;
- The community prefers a messaging tool they are familiar with already and that they have on their mobile phones.

WhatsApp was identified as a platform that included a group messaging tool and included these essential features. Further discussion with the Tech Steward led to a decision that two other considerations were important:

- Community members wanted to be able to self-subscribe (and unsubscribe) from the group;
- The Extension officer did not want the burden of having to manage a database of group contacts;

The Tech Steward created a WhatsApp group called 'MALF North' . A short series of tests was conducted with a few community members to ensure the system worked as intended. During the prototyping the Steward discovered that WhatsApp didn't support subgroups, so it was decided to create a second group for vegetable cultivation called 'MALF N-Veg'.

Some test messages were then sent through the group chat and the Tech Steward became comfortable with the features and workflow of the WhatsApp group. At this point, he also decided it would be important to have some help with managing the group so he asked one of the trusted community members if he could add him as a second admin to the group.

In this case it was possible to complete the rapid prototyping very quickly—in fact it was done during a coffee break at the community meeting as part of the campaign planning. Some tools will require more time to prototype but the goal is to do it within a relatively short time-frame in order to test the activity and work out any bugs or unanticipated difficulties. It should be completed *before* introducing the campaign to the wider community.

Go To Worksheet 1.3

PART F

Stewarding in Action: Conducting a Campaign

Following the rapid prototyping phase, the Tech Steward began to plan a campaign to pilot test the messaging system with the wider COP.

A campaign is an intervention of limited duration intended to address a specific objective identified together by the community, the Tech Steward, and sometimes an organizational sponsor (e.g., government department or NGO). The campaign provides an opportunity to use and evaluate a new choice of ICT tool without requiring a long term commitment of time or resources. *For the initial campaign especially, rapidity and simplicity are important in order to manage costs and expectations*. A campaign also enables the Technology Steward to collect feedback through conversations, questionnaires, and tracking usage of the ICT tool in order to better understand how the community is taking advantage (or not) of the new choice available to them.

As seen in Table 1, a campaign is influenced by four factors: (1) Sponsor, (2) Technology Steward, (3) Community members, and (4) the choice of ICT Tool/platform.

Table 1: Four factors in the MALF North Campaign

Sponsor / Partner Organization	**Technology steward**	**Communities of Practice**	**ICT Platform/tool**
MALF	Extension officer, St. George County	MALF North Region farmers; Vegetable farmers in Orange Grove/Arouca District	WhatsApp (group chat)

Having completed the rapid prototyping, the Tech Steward planned the campaign launch to coincide with the seasonal cultivation of vegetable crops (e.g., tomatoes, dashine, pumpkin etc.) when it was expected that the messaging system would have immediate value and impact for the COP.

The campaign was planned to run initially for eight weeks. Prior to the launch (pre-campaign), the Technology Steward hosted a community meeting to introduce it to the wider COP. At that meeting, he reviewed the consultation process that had taken place, answered questions, and reminded them of the goal of the campaign, and provided information about joining the WhatsApp group. He also helped a number of farmers to install and configure WhatsApp on their devices. At the end of the meeting, he provided some leaflets to be distributed in the community to further promote the campaign and provide information about joining the WhatsApp group.

During the campaign, the Tech Steward carefully monitored the membership of the group and the messaging traffic taking place within it. Initially there were relatively few farmers joining the group, so he worked closely with some trusted community members to encourage others to join and distribute posters in areas frequented by farmers. The Extension Officer also posted a series of regular information updates with occasional questions sent out to the group to spark discussion. After a few more weeks, the number of group members increased significantly, as did the number and frequency of messages exchanged, although it was slow at the beginning.

At the end of the eight week period (post-campaign) the Tech Steward met again with the community members to present the results and discuss the strengths and weaknesses of the WhatsApp as a group messaging platform. He distributed a brief questionnaire to the community members, asking them for feedback and interest in continuing with WhatsApp, or exploring other options.

The Tech Steward also did some analysis to determine if the campaign in fact met its objective of reducing cost and improving timeliness of messaging by comparing his travel and response times during the campaign against a baseline measure he had established prior to the campaign. (A faculty member from UWI had provided information that helped him to calculate a baseline and related measures for timeliness and cost). He also kept a record of attendance at community meetings before and after the campaign to determine if group messaging had made any significant difference.

Based on this analysis and feedback from the community, the Tech Steward then wrote a brief report on the campaign, shared it with the community members and with MALF. The results suggested that some farmers chose to use WhatsApp for chatting with others, but most preferred to use it for receiving scheduling information and updates from the Extension officer rather than using it for asking questions about their crops.

At a subsequent meeting, the community agreed to continue using WhatsApp with some changes to the policy and purpose of group messaging. At that meeting, one farmer who participated in the first campaign suggested that they also try creating an ‘on-demand’ frequently asked questions (FAQ) list rather than a group messaging system for common queries related to vegetable cultivation and disease outbreaks.

Go To Worksheet 1.4

Results and Conclusion

In this fictional case study, the Extension officer served as a Tech Steward for the COP of MALF North region. In this role, he provided leadership in helping to strengthen the COP by improving livelihood communication practices through appropriate use of a low cost ICT solution. The case study illustrates the four core principles of technology stewardship:

- Vision before technology
- Keep it simple and affordable
- Understand failure and build on success
- Use the knowledge around you

Community consultation and strategic planning led the Tech Steward to recommend the group messaging feature of WhatsApp for the campaign. With some persistence over the course of the eight week campaign, the Tech Steward was able to encourage a significant number of community members to join the WhatsApp group and participate in the messaging activities. Following the campaign, the Tech Steward sought feedback from the community members and with support from UWI and MALF was able to evaluate the outcome of the campaign in terms of its cost effectiveness. The campaign also resulted in some community members suggesting other ideas for using ICT to enhance communication practices.

Overall, we can point to this case as a successful outcome because the Tech Steward played a leadership role in strengthening the community of practice by enhancing the *informational capabilities* available to members of the MALF North region in the following ways:

- The Tech Steward made the community aware of the existence of a range of ICT choices to address the messaging challenge;
- The Tech Steward helped the community to develop a clear sense of choice by presenting a use case and prototype with a group messaging app;
- The Tech Steward supported the effective use of choice with a focused and well executed campaign using WhatsApp;
- The Tech Steward recognized the achievement of choice by identifying the strengths and weaknesses of group messaging with WhatsApp based on findings from the campaign;
- The Tech Steward helped to sustain that choice by encouraging practices that would integrate the group messaging feature of WhatsApp into the *digital habitat* of the community of practice.

Recommended Reading

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