International Journal of Adult Education and Technology
Volume 13 • Issue 1

Program Planning and Animated Videos as Learning Tools in Sub-Saharan Africa:
A Case Study of an International Educational Collaboration

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ABSTRACT

This paper reports on a case study that explores how the integrative model of program planning can be applied to better understand the process of mobile learning efforts in diverse African contexts. The authors discuss how Scientific Animations Without Borders (SAWBO), a Purdue University-based program, creates educational videos accessible in over 220 languages and disseminates them for use on a diversity of electronic platforms, inclusive of but not limited to cell phones. The authors aim to advance important discussions related to how human resource development research and practice can be responsive to local communities while working to enhance agricultural productivity and gender equity in the Global South.

KEYWORDS

Adult Education, Africa, Animation, E-Learning, Global South, Human Resource Development, Mobile Learning, Program Planning

INTRODUCTION

There is a growing body of research that focuses on Adult Education and Human Resource Development-related initiatives across the African continent, which emphasize investments in human capital and equitable distribution of resources (Nafukho, 2013). Nafukho and Muyia (2013) highlighted the explosion of eLearning in African higher education as one promising path to more egalitarian access to education. Additionally, Arthur-Mensah and Shuck (2014) called on the human resource development (HRD) community to contribute to the growing body of work throughout Africa related to

DOI: 10.4018/IJAET.296399
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eLearning and pointed to the explosion of mobile phone usage across the continent as a fertile domain for the deployment of workforce-related eLearning. While mobile learning in African contexts—and research around this phenomenon—have grown prodigiously in the intervening years (Bello-Bravo, 2021; Bello-Bravo & Lutomia, 2016; Bello-Bravo, Lutomia, Madela, & Pittendrigh, 2017; Bello-Bravo, Lutomia, Songu, & Pittendrigh, 2017; Bello-Bravo & Pittendrigh, 2018; Bello-Bravo, Zakari, Baoua, & Pittendrigh, 2018), it has not been substantively addressed in Adult Education & HRD journals. This research project aims to bring an HRD perspective to mobile learning in Sub-Saharan Africa. The researchers undertook a case study focusing on program planning aspects of delivering mobile learning content. In this case study, the researchers use the Interactive Model of Program Planning (IMPP) of Daffron and Caffarella (2021) to better understand how an organization that produces and disseminates eLearning content throughout Sub-Saharan Africa accounts for different aspects of program planning.

Although there is an explosion of research into mobile learning program planning in African contexts, previous studies have focused more on evaluating outcomes and artifacts than on the process of planning projects. However, process is critical to achieving outcomes, and hence the authors seek to provide insights into the processes of mobile learning program planning. In the remainder of this paper, the authors will: 1) provide a brief overview of the program studied in this case and their approach to producing and disseminating education videos, 2) review recent literature related to HRD throughout Africa, 3) introduce key aspects of the IMPP that are salient to our case study, 4) present the case study, and 5) discuss implications and conclusions for program planning and HRD in African contexts.

Overview of SAWBO and Rationale for the Focus on Animated Learning Content

The following section orients the reader to the proposed case by providing background information about Scientific Animations Without Borders (SAWBO) used as the case study in this paper and their approach to using animated videos to make learning materials accessible to learners with a wide degree of literacy skills.

About SAWBO Program

SAWBO is a Purdue University University-based program (formally at the University of Illinois at Urbana-Champaign and then Michigan State University) that creates and distributes animated educational videos free of charge. Founded in 2011, SAWBO's mission includes creating educational materials in the form of animations for low literacy learners in local languages. So far, SAWBO has more than 110 topic area videos in more than 220 different languages. These videos span the sectors of agriculture, health, and women empowerment. These videos can be accessed from a variety of SAWBO channels and used on mobile phones, tablets, televisions, and overhead projectors. The program relies on volunteers from all over the world to translate, record, voice overlay, share, deploy, and train others. SAWBO values indigenous knowledge and engaging those who live in the margins of society by capturing their local knowledge and languages and sharing it globally. SAWBO uses more learner-centered, interactive ways of teaching, which allows learners to develop their personal style and bring to fore what they know in interacting with the presented content. Borrowing from adult learning theory, these video animations provide literacies to marginalized communities and empower community members by imparting knowledge and skills, as well as, raising awareness with the goal of transforming communities.

A knowledge chain, as defined within the SAWBO system, has four basic links as processes, which includes the transitions between them as follows: (1) to identify and scientifically frame a problem so that solutions to that framing of the problem are implied, (2) to embody that scientifically abstract solution to the problem in a concrete, animated video—overdubbed as needed into any locally accurate dialect—as a means of effecting knowledge transfer about the importance, context, and need to act on the solution offered for the problem in the video, (3) to disseminate and maintain

an infrastructure that affords not only free and easy access to SAWBO videos for educators, learners, and researches but also a means for SAWBO to collect and incorporate feedback on any video or part of the knowledge chain itself, (4) to look for ways to more widely scale the reach of any video and the processes that developed it, and (5) document experiences.

Initially, videos are produced and released in English, and then a similar process is followed with language experts from around the globe to place content into a great diversity of languages. This approach allows individuals and organizations of any size, from small community-based organizations to large government and international organizations, to have access to education content in local languages that is scientifically accurate and accessible at no cost to these groups.

Animated Videos

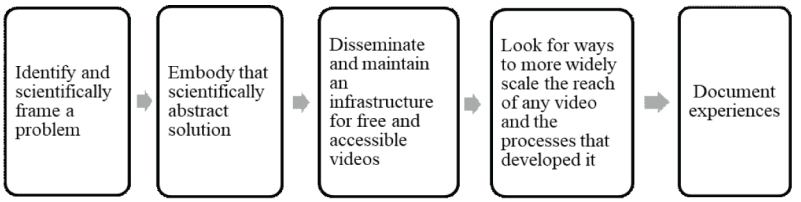
Animated videos provide a useful way of teaching scientific information in an accessible manner and have been deployed throughout Sub-Saharan Africa to disseminate information related to agricultural improvement and public health (Bello-Bravo, 2020; Bello-Bravo & Baoua, 2012; Bello-Bravo, Olana, Enyadne, & Pittendrigh, 2013). Videos have now become ubiquitous in many developing nations because they can be loaded on cell phones and watched by individuals or groups. In general, animated multimedia contexts improve learning (Lowe & Schnotz, 2014; Mayer & Moreno, 2002) and have been shown to be no less effective than live-action presentations (Smith, McLaughlin, & Brown, 2012) while being much less expensive to produce (Lowe, 2001; Lowe & Schnotz, 2014).

Cellular phones have become an important tool for disseminating educational videos globally. In most African countries, these devices are used in banking, general commerce, and as a general educational tool, including communicating with others--such as traders, accessing information, making decisions about buying and selling, learning, accessing extension services, and sharing of educational content—including videos (Feder & Savastano, 2017; Porter, Hampshire, Abane et al., 2020; Sanya & Odero, 2017; Walter, Finger, Huber, & Buchmann, 2017).

Recent HRD Literature Centering African Perspectives

The HRD community is steadily producing quality research focused on African experiences. Recent works include studies of learning transfer (Kiwanuka, Miiro, Matsiko, & Nkalubo, 2020; Suleiman, Dassanayake, & Abang Othman, 2018), teacher training (Oonyu, 2019), higher education (Johnson, 2019), skills & capabilities development (Arubayi & Akobo, 2018; Oats & Gumbo, 2019; Otchia & Yamada, 2019; Yamada, Otchia, & Taniguchi, 2018), healthcare and literacy systems (Akello, Lutwama-Rukundo, & Musiimenta, 2017; Davis, Arana, Creel et al., 2018; Davis, Menser, Juarez, Tomaszewski, & Kash, 2019; Regmi, 2019; Wekullo, Davis, Nafukho, & Kash, 2018), promoting learning (Biney, 2019), and leadership development (Modisane, 2018) post-coloniality and NHRD (Ekuma, 2019), and collaborations in North-South scientific international projects (Lutomia, 2019). While various components of program planning are discussed throughout this literature, none of the recent studies center a planning process in their research. Likewise, technology and e-learning are not well-developed areas in the study of African HRD.

Figure 1. Scientific Animations Without Border's (SAWBO') framework around content creation, maintenance, scaling, and documentation of outcomes



Away from HRD literature in academic journals, most of the program planning (also known as *project* planning in Africa) takes place in the nongovernmental sector. The planning documents are hosted on funding organization websites or embedded in project reports from organizations. Scholars have examined program or project planning in Africa and have argued that it is generally too informed by a Eurocentric sensibility and that culturally competent and intelligible African-based cultures should be utilized in project management (Ika, 2012; Muriithi & Crawford, 2003). Specifically, Muriithi and Crawford (2003) wrote, "There is urgent need for empirical work to: formalize a project management framework for Africa, confirm which tools and techniques of the present project management orthodoxy work, which one does not and why, and articulate an effective indigenous approach to project management in Africa" (p. 318); several scholars and attempts have answered this call (c.f., Jackson, 2013; Jackson, Amaeshi, & Yavuz, 2008; Karsten & Illa, 2005).

Theoretical Framework

This paper applies the Interactive Model of Program Planning (IMPP) from Daffron and Caffarella (2021) to organize and analyze the case study of SAWBO. Figure 2. Provides a summary of the eleven major components of the model.

This model consists of eleven major components, each of which provides a list of tasks and suggestions for program planners to consider. This model is nonlinear and highly customizable. Planners can select the components most applicable to their program and use all or some of them in any order and/or a combination. Other distinguishing characteristics include an emphasis on collaboration among stakeholders and consideration of cultural differences. The collaborative nature of this model effectively creates space for sharing ideas and managing the various components and tasks related to the program planning process. The global aspect of the model takes into account cultural differences by creating opportunities for planners to determine why and how components are selected and interpreted according to varying cultural mores and dictums. A review of the last five years of articles focused on African contexts and published in 17 selected adult education and human resource development journals found that the IMPP has frequently been invoked in research regarding mobile learning and program planning in sub-Saharan Africa (Aluko, 2020; Ashong, 2018; Avoseh, 2010; King, 2010). However, our paper is the first paper we are aware of to provide a comprehensive examination of a mobile learning effort using all eleven components of the IMPP. The IMPP's eleven components include support, needs assessment, context, evaluation, learning transfer, instruction, objectives, scheduling, budgets, marketing, and details. Each component of the IMPP is represented in column one of table 1 and will be explored in greater depth throughout this paper.

Figure 2. Interactive Model of Program Planning approach used by the Scientific Animations Without Borders (SAWBO) program

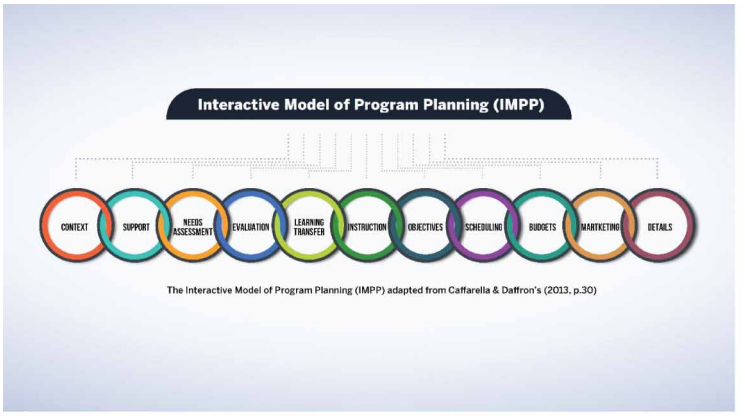


Table 1. Overview of findings regarding program planning

Component of IMPP	Salient factors in African Program Planning
Context and Instructional Design	Language Varying Levels of Education
	Indigenous Knowledge
Evaluation and Transfer of Learning	Learner Perceptions & Program Implementation Evaluated Additional support needed to assess learning transfer
Needs Assessment, Goals, and Objectives	Specific local needs & Alignment with Established National and Global Priorities
Support and Budgeting	Support at regional, national, and international levels. Collaborations between governments, service providers, TV stations, NGOs, and individuals
Details, Scheduling, and Marketing	Finding appropriate technological platforms for e-learning dissemination Maintaining communications with partners Considering costs and accessibility of technology

Support, Needs Assessment, Objectives, and Budgets

Building a strong support network is key to establishing a solid foundation reinforced by support from various organizations, institutions, and influencers. Securing this support gives HRD education programs the opportunity to grow through access to resources needed to implement well-developed programs (Daffron & Caffarella, 2021). Gaining support and being responsive to the needs of supporting stakeholders requires program planners to complete a needs assessment. Since program planners are expected to meet the educational needs of learners, identifying and prioritizing program ideas and necessities is key to gaining institutional and financial support for programming. Planners should be aware that program costs often emerge as a priority item among funders, so the budget component is frequently utilized. A common task related to budgeting includes the development of a comprehensive budget model that can be used to prepare and manage costs and expenses, create contingency plans, and generate detailed income sources. Combining the goals of funding bodies, as well as suggestions from possible program participants, together with relevant statistics, can aid in developing a comprehensive needs assessment for a program.

Budgeting

SAWBO's budget is informed by the sensibilities of the project budget. A project budget accounts for the total cost required to complete the project within a certain period. The budget varies depending on the size and scope of the proposed project. This project budget includes labor costs, material procurement costs, and operating costs (Corporate Finance Institute, 2021). However, funding and maintenance of the program are done through a complex mixture of external grant funds and internal university flexible finds. Grants often allow for specific short-term and targeted creation of content within a set number of languages and do not often allow for flexible creation and adaptation of content where unique short-term opportunities emerge or for long-term goals of the program.

Goals, Evaluation, Details, and Learning Transfer

Goals and objectives are listed as another model component in the planning process, as they are related to the program purpose. According to Daffron and Caffarella (2021), 'Program goals refer to broad statements of purpose of intent for education and training programs, whereas program objectives identify the specific outcomes of the program' (p.161). Due to the explicit nature of developing program objectives, this may be an area where planners should consider applying the detail component

of the IMPP, which simply recommends using as much detail as needed where needed throughout the planning process. Detailed information is also significant when designing instruction, which is listed among the eleven components. This component includes selecting and organizing information designed to aid in the interaction between learners. Thus, it would behoove planners to recognize that instructors also serve as learners in adult education environments. To that end, familiarity with adult learner characteristics and adult learning theories is key when designing instructional plans, especially if the planner chooses to incorporate the learning transfer component. Transfer refers to the process of learners applying information learned in training to relevant situations; Daffron and Caffarella (2021) explained, 'Seven factors…are critical for the process of transfer to successfully occur, including the planning process, learner characteristics and motivation, design and delivery methods, learning context, immediate application, workplace environment, and eliminating barriers to transfer (p. 217).

Context, Scheduling and Marketing

The context component of the IMPP can also be incorporated with the needs assessment, as the program context focuses on prudent examinations of the proposed content. It also challenges planners' knowledge and awareness of various facets that may impact their program (Daffron & Caffarella, 2021). The scheduling component can incorporate a variety of the other ten components as the program needs assessment, goals, objectives, and budget can all impact how educational programs are structured, staffed, and delivered. Examples of program formats include individual learning, face-to-face small or large group learning, online learning, or community-based learning. Having scheduling in place can make the marketing component easier, as the training format, together with the program goals and objectives, can shed light on the target audience that would benefit most from marketing campaign efforts. In fact, conducting a target audience analysis is crucial for understanding the potential participants' background and overall fit for the program being planned because it allows those responsible for facilitating the marketing function to tailor the branding, price point, and promotion efforts in a way that attracts the best participant pool.

Evaluation

Although evaluation is listed as the eleventh and last component here, it is important to remember that the IMPP is nonlinear, so experienced program planners may choose to formulate evaluation plans earlier in the planning process. This component requires the process of building or reviewing a program in a way that observes whether or not there is congruence among program design, delivery, and outcomes. Determining evaluation techniques, along with an approach to how evaluation data will be collected and analyzed, will assist planning stakeholders with assessing the quality of a program (Daffron & Caffarella, 2021).

METHODS

Case study research is a qualitative method of inquiry that affords robust findings into complex social phenomena (Eisenhardt & Graebner, 2007; Stake, 2000; Yin, 2012). For this study, the authors applied an explanatory case study as it is rich in explaining qualitative phenomena. According to Yin (2012), an illustrative case study describes the case based on facts, considers alternative explanations, and gives a conclusion based on the facts. Case study research calls for acquiring multiple sources for triangulation, thus increasing the veracity of any explanation (Creswell, 2014; Rombo, Lutomia, & Sore, 2020). In this case study, we collected information about SAWBO from sources including peer-reviewed publications related to their activities, the program's websites, and informal interviews with program staff (two of whom are co-authors on this paper). While none of the published articles about SAWBO specifically focused on program planning, reviewing papers that focused on a number

of topics including processing shea nut for sale to international purchasers (Bello-Bravo, Lovett, & Pittendrigh, 2015), using neem plants to produce low-cost organic pesticides (Bello-Bravo, Nwakwasi, Agunbiade, & Pittendrigh, 2013), and the video about preventing malaria and cholera in Benin (Bello-Bravo, Dannon, Agunbiade, Tamò, & Pittendrigh, 2013) revealed multiple insights about SAWBOs program planning approaches as did the review of the website. A member of the research team who was previously unfamiliar with SAWBO conducted a thorough review of these published materials analyzing them based on IMPP (Daffron & Caffarella, 2021), and developed an initial understanding of the case. After this was conducted, his findings, as well as questions about the program planning process, were shared with SAWBO staff members, and the case was fleshed out through a dialogical process. Thus, the final case contained insights from both published sources and the tacit knowledge of program staff.

FINDINGS

In the following section, information from the case will be put in conversation with the IMMP by discussing how SAWBO responds to various contextual factors, evaluates programs and assess learning transfer, establishes goals and objects, secures support from various stakeholders, and addresses various details, including scheduling and marketing. In column one, the eleven components of the IMPP are clustered into five groupings. Groupings were made based on the finds of our case study and represent components that were very closely related in the context of planning e-learning programs throughout Africa. Column two highlights especially salient aspects related to the five groups of IMPP components. Table 1 is intended to provide an overview of how the IMPP is being utilized by SAWBO as well as an overview of our findings section.

Context and Instruction Design

Daffron and Caffarella (2021) argue that program planners need to be aware of the context in which the program they are planning exists, and that instruction needs to be responsive to contextual factors. SAWBO's program planners account for diverse African contexts in a number of ways, including 1) adapting content for delivery in local languages, 2) accounting for the general education levels of the communities where materials are disseminated, 3) considering locally situated ecosystems, and 4) basing educational content on indigenous knowledge.

Language

By producing relevant educational animations in local languages, SAWBO offers the possibility of strengthening the livelihood of people living in rural areas by giving them greater access to ideas they can incorporate into their lives. Some notable examples of SAWBO's animated videos in the local languages are found in Niger and Benin. SAWBO used Hausa in Niger and Fon and Yoruba in Benin, languages that are spoken by the many in these two countries. (Bello-Bravo & Baoua, 2012; Bello-Bravo & Pittendrigh, 2012). Videos in these languages were used to teach about how to process the neem plant (a tree that grows abundantly in the region) to make inexpensive organic pesticides. These videos explain how to harvest the seeds from the tree, how to select the right seeds for making pesticides, how to dry them in the sun, how to grind the seed, and the rest of the process to create a high-quality pesticide. Using a translation process driven by volunteers who do new voice-overs in a variety of languages, SAWBO has been able to and continues to scale up this educational content by making it available in over 220 languages (Video Library) on over 110 topic areas including health, agriculture, and women's empowerment and has collected over 50 million known users who have accessed SAWBO content across the globe. This translation driven scalability allows educational content to be easily adapted to provide content that is adapted to meet local needs in a variety of linguistic contexts.

Considering Varying Levels of Education

SAWBO's educational planning also accounts for the diverse levels of education throughout Africa. For example, the video discussed above has enough conceptual depth and practical application to be useful to a well-educated agricultural worker, and, because the various steps involved with neem processing are demonstrated visually through animations and explained aurally in local languages, the content is also engaging for low-literate learners (Bello-Bravo & Pittendrigh, 2012). Given the high rate of illiteracy and low levels of formal education in many African countries where SAWBO disseminates videos, an animated approach is an effective approach in these contexts (Bello-Bravo, 2021; Bello-Bravo & Lutomia, 2016; Bello-Bravo, Lutomia, Madela, et al., 2017; Bello-Bravo, Lutomia, Songu, et al., 2017; Bello-Bravo & Pittendrigh, 2018; Bello-Bravo, Zakari, et al., 2018).

Indigenous or Traditional Knowledge

Another important element to consider in formulating an instruction plan and striving to achieve objectives is the indigenous knowledge of the participants on the topic. According to Agrawal (2009), shifts have occurred in how understandings of indigenous or traditional knowledge are now understood; for example, research now challenges the earlier framings and assumptions of indigenous knowledge as inefficient, inferior, superstitious, and/or not development-oriented. Presently, there are efforts to connect indigenous and scientific knowledge in order to address medical, agricultural, and economic challenges in communities around the world (Bello-Bravo, 2020; Goma, Prasha, Kalungia et al., 2016; Kadykalo, Cooke, & Young, 2021; Lutomia & Bello-Bravo, 2017; McPherson, Sammy, Sheppard et al., 2016; Mistry & Berardi, 2016; Ponnusamy, Kale, Ravi, Devi, & Sharma, 2016).

SAWBO program planners proceed from an understanding that the knowledge base of most indigenous science is rooted in place-based natural-history observations or based on previously used and adapted knowledge. They, therefore, work to incorporate these types of knowledge into the educational materials. One example of SAWBO use previously used and employed knowledge to improve the lives of people in communities is the pest control system based on the extraction of neem seeds in some parts of west African countries like Mali and Niger. Neem has long been used in pest control and medicine in India, and more recently in Africa (Bello-Bravo, 2013). In Kenya, Malawi, and Zambia, for instance, neem has been used as a pesticide to kill rats and mice and treat other diseases. As Bello-Bravo argues, such knowledge has been promoted and utilized in the scientific world. One interesting thing to know about Neem trees in Malawi is that the trees are planted by individuals on their private land, but they are communally used because they are used mostly for medicinal purposes, and as per the culture, natural medicine born out of indigenous knowledge is for free. The other advantage of neem is that it is a very resistant plant that can grow both in extremely dry places and in flood-prone areas.

Evaluation and Transfer of Learning

Daffron and Caffarella (2021) define program evaluation as a process used to determine whether or not the process and the delivery of the program were achieved or the outcome expected was met. They further argue that program evaluation is important because it helps to drive innovations that provide direction and accountability to the program. SAWBO evaluates a variety of factors related to program planning, including learner perceptions of the educational materials, program implantation strategies, and learning transfer.

Learner Perceptions and Program Implementation

SAWBO program planners have conducted multiple evaluations of learner perceptions of their educational materials and implementation strategies. For example, SAWBO evaluated the perceived value of the aforementioned neem processing video in the eyes of local farmers in Niger (Bello-Bravo, Nwakwasi, et al., 2013). In another example, from Benin, SAWBO conducted a study regarding the

effectiveness of programs related to Malaria and cholera prevention as well as producing pesticides from neem seeds and identified several areas for improvement. In another evaluation, SAWBO randomly selected program participants and conducted interviews and questionnaires asking them their experiences with educational videos and how these videos have influenced their decisions on what type of crops to plant or what agricultural method to employ (Bello-Bravo & Baoua, 2012; Bello-Bravo, Lutomia, Abbott et al., 2017; Bello-Bravo, Nwakwasi, et al., 2013). This evaluation consisted of measuring or evaluating learning gains using pre-test and post-test research design. Most recently, at a follow-up on a SAWBO-presented novel approach using jerrycans to more safely storing postharvest seed (Mocumbe, 2016), SAWBO measured a 93% knowledge retention rate and 89% solution adoption (Bello-Bravo, Abbott, Mocumbe et al., 2020).

SAWBO also frequently conducts pilot studies investigating the perception of the participants and their experience after watching short, animated videos to assess whether the program is meeting its goals (Bello-Bravo & Baoua, 2012; Bello-Bravo, Dannon, et al., 2013). This perception is in terms of the content of the video, characters, language, and access, as well as topics for future videos that interest the users (Bello-Bravo & Baoua, 2012; Bello-Bravo, Dannon, et al., 2013; Bello-Bravo, Nwakwasi, et al., 2013). In Nigeria, for example, SAWBO planned a four-phased pilot deployment, which included follow-up surveys to generate feedback on the effectiveness of the educational material (Bello-Bravo, Nwakwasi, et al., 2013).

The other evaluation strategy SAWBO uses is focus group discussions. In this method, participants are introduced to SAWBO's educational materials and given the SAWBO animations, and participants view the animations available in their local language and then were asked to form small groups and discuss what they have learned from each animation. The participants also express their opinion on the animations and if they believed the videos would be helpful to their communities and how the animations could be improved. Not only do farmers offer their opinion on the animated videos, but Bello-Bravo also indicated that SAWBO engages multiple stakeholders to examine the usefulness, message clarity, and other important aspects. This approach reflects SAWBOs participatory problem-solving in agricultural extension that supports innovation among farmers (Bello-Bravo, Lutomia, & Pittendrigh, 2019).

One example of how SAWBO conducts focus groups can be found in their work in Ethiopia (Bello-Bravo, Olana, & Pittendrigh, 2015) where, as a way of evaluating the effectiveness of the program, SAWBO organized a consultative meeting which was based on four phases: promotion, deployment, evaluation, and deployment (Bello-Bravo et al., 2015). These consultative meetings were done in collaboration with other stakeholders such as the Forum on Sustainable Child Empowerment, a local NGO based in Adama, which together with SAWBO worked on an animation project locally translated into three major Ethiopian languages Afan, Oromo, Amharic, and Tigrigna (Bello-Bravo, Olana, et al., 2015). While this meeting was done in the spirit of collaboration, it also provided an avenue for evaluation. Participants in these meetings were introduced to SAWBO's educational materials and given the SAWBO animation, and they together watched the videos in small groups and were asked what they thought about the videos and if they believed the videos would be helpful to their communities (Bello-Bravo, Olana, et al., 2015). Here are some of the questions that the program participants in Adama addressed:

1. How do they think the content of the animation would be useful in their context?
2. Do they have access to a mechanism for watching and sharing such content?
3. What is the best way of obtaining feedback to drive new content development?

In another example, from Nigeria, SAWBO worked in collaboration with the Federal University of Technology Owerri (FUTO) to evaluate the deployment of the three animations in villages in the southeastern part of Nigeria (Bello-Bravo, Nwakwasi, et al., 2013). The study was aimed at finding out the impact of the animation videos on people's perception of malaria, cholera prevention

methods, and producing natural pesticides from neem seeds. The effort was aided by students from FUTO who conducted a survey consisting of ten questions that focused on phone ownership, learner ages, the effectiveness of using cellphones for communicating education content, learner education levels, and learner perceptions of the animated videos, what lessons were learned from the videos, and how to improve them.

In Niger, SAWBO collaborated with Institut National de la Recherche Agronomique du Niger (INRAN) to conduct a survey designed to investigate the perception of utility that the participants experienced watching animated videos explaining a technique that can improve the quality of people's lives and their crops. The study also assessed the potential for local acceptability of three different SAWBO animations, which were the triple bagging for storage of cowpeas, preparation of neem for pest control, and the treatment of water for cholera prevention (Bello-Bravo & Baoua, 2012).

This section highlights some of the findings from evaluations SAWBO conducted within different countries in Africa. While these findings are more general and common in most SAWBO programs, they are not exhaustive. One of the common findings in SAWBO program evaluations involves the economic challenges of owning a device (Bello-Bravo, 2021), which is all the more pressing given that cellphones have globally become the primary device for accessing Internet content (Bello-Bravo, Brooks, Lutomia et al., 2021). Since cellphones are used to keep, watch, and share animated videos, maintaining such devices seems challenging for many Africans. In some communities such as Nigeria, Niger, and Benin, few people have access to electricity, and charging devices require money. Not only is charging phones expensive, but some cellphones are also just complicated to use; therefore, lack of technological know-how for some users affects their ability to effectively use them for the animations. In other places such as Ethiopia, participants complained that there was a lack of video compatibility of some models of their cellphones. However, making content available such that it can be played on any video-capable electronic device allows local development actors to use other forms of deploying such content with target populations.

Learning Transfer

Another important element in the IMPP model is the transfer of learning. Daffron and Caffarella (2021) define learning transfer as the effective application of learning by program participants of what they learned as a result of attending educational or training programs. They argue that organizations and government agencies spend billions of dollars every year on workplace learning; however, evidence indicates that there is a generally low transfer of learning in these workplace training (Daffron & Caffarella, 2021). When organizations spend more money organizing workplace training that results in a low transfer of learning, it means that money and other resources have been wasted. SAWBO programs emphasize the transfer of learning by creating programs meant to be applied in agricultural work and healthcare settings; however, the programs have added evaluations of learning and content as resources permit. In those cases, where one of the challenges faced has been the time lag between funding, multi-year studies, and the time it takes to filter such outcomes through peer-reviewed journals. In a vast majority of cases, the program has received funds for the creation of content only and a sub-set of funding sources have provided resources for long-term studies.

In one recent study, program planners assessed the transfer of learning by revisiting a project cite two years later to see if participants were able to demonstrate the knowledge they were exposed to in earlier training. Results indicated that, 97.9% of participants demonstrated their ability to execute a step-by-step process of using jerrycans to prevent post-harvest loss (Bello-Bravo et al., 2020). Additional research is needed to evaluate learning transfer related to different topics and in different populations (Kiwanuka et al., 2020; Suleiman et al., 2018), which will require long-term investments by funding entities.

GOALS AND OBJECTIVES

Daffron and Caffarella (2021) argue that program goals and objectives are an integral component of the planning process and must be considered carefully. SAWBO's organization mission includes women's empowerment, agricultural education, and health education, so goals embraced by the organization must fit into one or more of those categories. The specific goal-setting process for different programs considers local needs as expressed by community members as well as training priorities identified by leading organizations such as the United States Agency for International Development (USAID). The organization also seeks to establish goals that are economically, socially, and environmentally sustainable.

Specific Local Needs

According to Bello-Bravo, Adams, John, and Pittendrigh (2021), SAWBO collaborates with local scientific and indigenous knowledge experts in order to establish learning goals that address specific areas of public concern to rural Africa communities. This is a flexible and adaptive approach to setting program goals that seek to engage multiple stakeholders across the community.

In one goal-setting example, SAWBO sought to combine its commitment to agricultural education and women's empowerment with the needs of rural women who participated in the harvesting of shea and earned very low levels of compensation for the effort. Shea is an important ingredient that helps to drive billions of dollars in sales in cosmetics and foodstuffs—including chocolate and shea butter (Bello-Bravo, Lovett, et al., 2015). Shea trees grow across 4 million km^2 of sub-Saharan Africa, and gendered divisions of labor frequently construct the harvesting of shea seeds as women's work. The prices multinational companies pay for raw shea nuts are so low as to keep women who supply them in poverty; however, when women learn to process nuts in accordance with the standards expected by the international market, they are able to obtain much greater remuneration for their labor. To address the economic needs of such women, SAWBO created videos that demonstrated steps in processing shea that could be completed in rural settings with readily available materials (Bello-Bravo, Lovett, et al., 2015). In addition to educational materials that taught how to process shea nuts, SAWBO also created videos to help inform rural women about their position in the global shea market so that they would be further empowered to negotiate for stronger remuneration. The goal of the video was responsive to the needs of women in the shea nut business, and it provided the information that helped women collectors to connect with the global chains as most of their shea nuts are factory processed which is supplied by traders who do not understand the quality issue or share information with their village-collectors. In this case, Bello-Bravo argues that the videos have the potential to provide the women the knowledge of using fewer resources to produce higher quality shea kernels, which in turn offer higher extraction yield, which helps to lower production cost making a more marketable product.

Aligning With Established National and Global Priorities

In addition to having some of their goal-setting priorities driven by local needs, SAWBO is also responsive to educational priorities established by national governments, international organizations, and grand funders. Past (and current) partners in goals setting include the World Health Organization (WHO), the Food and Agriculture Organization (FAO), The United States Agency for International Development (USAID), the Nigerian Ministry of Health, the National Soybean Research Laboratory (NSRL), the Legume Innovation Lab (LIL), as well as others (Bello-Bravo & Pittendrigh, 2021). In one such example, SAWBO set goals for an educational program regarding malaria prevention and treatment-based WHO recommendations and local needs in Western Kenya (Bello-Bravo, Lutomia, Madela, et al., 2017). In another example, SAWBO collaborated with representatives from both the United Nations Communications Team in Nigeria and the Nigerian Ministry of Health to set goals for educational videos related to abating myths associated with COVID-19.

Support and Budgeting

Securing support for an educational program means that program planners seek to make a connection with the influencers in that community. This means making effective collaboration with other organizations with a similar passion and objectives remaining in communication with the stakeholders (Daffron & Caffarella, 2021, p. 124). Because of the diverse nature of SAWBO's educational programs and the varied national context in which they work, SAWBO works to maintain a dynamic partnership with scientists both in Africa and around the world, national governments, international development agencies as well as local chiefs, educators, and religious leaders (Bello-Bravo, Lutomia, Njoroge, & Pittendrigh, 2019; Lutomia, 2019; Lutomia, Bello-Bravo, & Pittendrigh, 2018).

For example, in Sierra Leone, the SAWBO team collaborated with organizations involved in a response to Ebola (Bello-Bravo, Lutomia, Songu, et al., 2017; Bello-Bravo, Songu, & Pittendrigh, 2015), including Njala University, United Nations Monitoring Ebola Emergency Response in Sierra Leon, Information Management Working Group, United Nations Development Programs (UNDP Sierra Leon, United Nations Pillars (WHO, OCHA) DFID, National Youth Commission, Ministry of Health and Sanitation, the Tertiary Education Commission and many other organizations and government departments. Still ongoing is SAWBO's contribution to efforts to mitigate or eliminate the spread of an invasive maize pest, Fall Armyworm, in Africa, Nepal, Bangladesh, and Southeast Asia (Bello-Bravo, Huesing, Boddupalli et al., 2018).

The importance of institutional partnerships between both universities where SAWBO is based at the university could build this relationship over time. Having support from the home university and having access to key stakeholders facilitates productive collaborations for future solutions to problems such as Ebola. For instance, students from Njala have leveraged their linguistic diversity to perform seven translations and voice recordings using existing SAWBO health animations (Bello-Bravo, Lutomia, Songu, et al., 2017; Bello-Bravo, Songu, et al., 2015). This collaboration also resulted in the development of the charcoal water filtration system that villages started to use.

DETAILS, SCHEDULING, AND MARKETING

Daffron and Caffarella (2021) emphasized the need for project planners to attend to a variety of details, including those related to scheduling and marketing. Because the IMPP model was originally conceived for planning face-to-face educational programs, many of the factors this model emphasizes are either not relevant to SAWBO's eLearning approach or manifest very differently in the eLearning context. For example, the IMPP emphasizes the importance of picking appropriate dates, meeting rooms, facilities to conduct an educational program such as a conference or symposium. For SAWBO, identifying specific days for the delivery of educational content is not a salient concern, but scheduling is nonetheless important when it comes to maintaining communication with partners and conducting program evaluations. Additionally, selecting facilities for educational programs is not of great concern for SAWBO, but rather identifying appropriate technological platforms for video dissemination is paramount. Details addressed by SAWBO on this front include costs of technology such as laptop computers and mobile phones, power failures, lack of video compatibility of some models of cell phones, and lack of technological know-how for some users. These types of details are frequently raised as areas of concern during the assessments of SAWBO programs. A variety of creative strategies have been used to respond to these challenges, including the sharing of devices, the use of solar panels for charging, and community-based support in terms of learning to navigate new technology.

Implications for Future Program Planning and Research

This case study provides a variety of insights that can be useful for education providers who are engaging in planning mobile learning programs in Sub-Saharan Africa, including ways that aspects of the IMPP can be utilized. Additionally, based on the analysis of this case, we suggest several

considerations that SAWBO and similar organizations may want to consider in their program planning. These include the following SAWBO examples in seeking new and expanded ways to involve African-based partners in program planning and development. Additionally, practitioners should further consider how, often patriarchal, local cultures affect how women receive educational programs aimed at their empowerment, and how scalable programs like SAWBO be used to address low literacy in African communities (Bates & Holton III, 2004).

Using the IMPP in African Contexts

The IMPP design is flexible and can be useful in different contexts. This section looks at different elements within the IMPP that can be useful in planning for education programs in Africa. The first element is the context. When planning or designing an education program, program planners need to consider a number of contextual factors, including linguistic plurality, differentiated levels of formal education and high degrees of low literacy, and the importance of indigenous knowledge. Understanding educational contexts will require thorough needs assessments and engagement with a variety of locally situated stakeholders to ensure that local needs are being met (Goslin, Van der Klashorst, Kluka, & Van Wyk, 2016; Lutomia, 2019; Nyerere & Friso, 2013).

Planners also need to consider how to best evaluate programs and assess learning transfer (Daffron & Caffarella, 2021), and our case shows a variety of methods being used. Given that evaluation instruments used were often very similar from nation to nation, it appears that the groundwork has been laid for a meta-analysis of small-sample size evaluations. In a similar vein, richer presentations of qualitative data, as well as further evidence of peer debriefing, member checking, and prolonged engagement with different communities, could improve the credibility and trustworthiness of the data (Lincoln & Guba, 1999). Evaluation of learning transfer is another area that can be improved by efforts such as adapting instruments used to approximate learning transfer among low-literate learners.

Additional Considerations for Program Planners Working in African Contexts

While SAWBO shows dedication to engaging local populations in a variety of stages of the program planning and implementation process it also includes Global South engagement in many steps of all processes (funding, production, defining content needs, etc.) and this has continued to increase over the lifetime of the program. SAWBO has and continues to engage Global South animator teams and engages Global South educational experts and content partners in the creation of content (most importantly defining what is needed). Video production requires advanced technology and skills that are readily and increasingly available in the Global South. SAWBO has primarily relied on Global South animators in the creation of content. For example, in African nations such as Nigeria that have thriving film industries; SAWBO has increasingly engaged African-based partners (across Africa) and animators (in Nigeria) to work on video production. The same model has been developed by SAWBO in Bangladesh and India as well as in several South American countries. Global North animation entities have proven to be too costly and challenging for SAWBO to engage, however, with the notable exception of university student animators trained by SAWBO itself. Additionally, and more importantly, SAWBO recognizes the need for an expanded network of educational experts who can play a highly active role in the development of such content. The technology to develop such content is a small component of its development – the major component is an investment of technical and educational expert time in video design, development, and finalization. As such, SAWBO has focused on increasingly engaging Global South academic institutions to build communities of practice in this critical component of production.

Another key area for program planners working in African contexts to consider is how local gender dynamics affect the educational participation of women. SAWBO has many educational resources aimed to help women empower themselves economically and socially, but additional research is needed about how these lessons are received by women and men in, often patriarchal, African communities.

Considering patriarchal contexts provides SAWBO and other program planners with an opportunity to increase their responsiveness to the needs of women.

Finally, while we acknowledge the value of creating educational materials that are readily accessible to low-literate adult learners, we also see the potential for organizations to use a SAWBO inspired approach to developing and disseminating resources aimed at raising literacy and numeracy rates. While such efforts are beyond the scope of SAWBO's mission, there is room for new organizations to develop animated videos in the areas of adult basic education. Sustainable development in many African contexts requires increased literacy rates, and SAWBO's model seems to hold great potential for developing scalable and accessible literacy training material.

CONCLUSION

This paper responds to a call for researchers to explore the potential for HRD research and practice related to mobile learning in Africa. The findings demonstrate that, in addition to thriving eLearning in African higher education, mobile learning is exploding to democratize access to educational content across the continent. The case study demonstrates one approach to embracing the linguistic plurality in the Global South in the production and dissemination of educational materials and opens the door for future HRD research in related areas. This paper also demonstrates how connections between core HRD practice areas, such as program planning, can be leveraged to affect agricultural production and gender equity in diverse African contexts.

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