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Keeping the Learning Going: Using Mobile Technology to Enhance Learning Transfer

Corinne Brion, PhD

Abstract

Every year billions of dollars are spent on development aid and training around the world. Little attention is paid, however, to the sustainability of the various interventions. Some studies suggest that technology usage can serve as an effective post-learning intervention to enhance the transfer of learning. Currently, there is a limited body of research examining how best to follow up after an educational professional development program in Africa. This qualitative exploratory study sought to address the gap in education development policy by examining three schools in Ghana, West Africa. This study helps increase our understanding of how technology can promote learning transfer in marginalized communities. This study also provides suggestions for trainers, practitioners and offer a tentative model of learning transfer. Findings indicate that the use of group texting via WhatsApp helped training participants implement new knowledge to their schools. Participants reported that the mobile technology intervention assisted peer learning, increased participants' motivation, reminded them of the training content and allowed them to network.

Keywords: mobile technology, policy, learning transfer, development, education, leadership, Ghana, developing countries

1. Introduction to the Problem

The United Nations and the international community have recognized a need to improve student-learning outcomes in all marginalized communities. Research in educational leadership has established that school leaders play a key role in improving student achievement (Marzano, Waters, & McNulty 2005). Furthermore, researchers have demonstrated that training the school leadership team is fundamental to improving learning and transferring knowledge (Grissom & Harrington, 2010; Leithwood, Louis, Anderson, & Wahlstrom, 2004; Swaffield, Jull, & Ampah-Mensah, 2013). Currently there is a lack of leadership training aimed to improve the school leadership teams in Africa, especially in West Africa (Bush, Kiggundu, & Moorosi, 2011).

In Africa despite the millions of dollars spent on aid for education, there is a lack of evidence-based outcomes, suggesting the financial support received did not produce sustainable results in the quality of education (UNESCO, 2015). This demonstrates, in part, the lack of emphasis that governments, policy makers, educators, facilitators and trainers have placed on the concept of learning transfer (Awoniyi, Griego, & Morgan, 2002). Broad (1997) defines learning transfer as “the effective and continuing application by learners—to their performance of jobs or other individual, organizational, or community responsibilities—of knowledge and skills gained in the learning activities” (p. 2). Cafferalla (2002) indicates that it may not be sufficient to offer training programs but rather trainings need to be culturally relevant to promote learning transfer and enhance the sustainability of the educational institution. Knowles (1980) and Mezirow (2000) stipulate that training programs do not frequently consider how adults learn and how to ensure that the new knowledge is transferred to the work place.

The purpose of this paper is to consider how mobile technology enhances learning transfer among school proprietors and head teachers in low-fee private schools (LFPSs) in Ghana. The implications of this study are not limited to education. This study is applicable to all marginalized communities and all sectors such as medicine, social and government services. To date, there is a lack of recent empirical research on the transfer of learning in adult professional development and how new acquired knowledge gets applied (Caffarella, 2002; Foley & Kaiser, 2013; Furman & Sibthorp, 2013; Hung, 2013; McKeough, Lupart, & Marini, 1995).

1.1. Mobile Technology to Enhance Learning Transfer

One strategy to enhance learning transfer and provide follow up post training in developing countries could be the use of mobile technology and platforms. In numerous countries worldwide, young and adult learners already have access to wireless technologies, which allow them to learn at their own pace, anywhere, anytime whether it is in a formal, informal or non-formal learning environment (Lai, Yang, Chen, Ho, & Chan, 2007; Looi et al., 2010). The use of wireless technologies has benefited teachers as well. It has allowed teachers to move from teacher centered pedagogies to action learning such as inquiry based or experiential learning approaches. In action learning, students are actively engaged in creating their own knowledge based on their interests and previous experiences (Herrington, Herrington, Mantei, Olney, & Ferry, 2009). Cochrane (2014) posits that mobile learning also promotes heutagogy or self-determined learning and the formation of communities of practice among students and teachers alike.

“Africa is the fastest growing cellular market in the world. It represents around 10 percent of the total cellular connections worldwide” (OECD & African Development

Bank, 2009, p. 94). Many innovative applications appeared in Africa in the last few years. Such innovations include e-banking, e-commerce and e-education. Within the education sector, e-education is defined as the connection between learners and other learners, teachers to professional support services and provides platforms for learning (Phiri, Foko, & Mahwai, 2014). E-education includes e-learning and mobile learning (mLearning). E-learning can facilitate the learning skills that are transferrable to the workplace (Arthur-Mensah & Shuck, 2014, p. 43).

According to the e-Learning Africa Report of 2013, which collected data from 42 African countries and 413 e-learning practitioners, the favorite tools to support education were laptops, mobile phones and social networking. These technologies provide learners more direct access to answers, increase their motivation and serve as reminders that learning can continue outside the classroom setting with others. Mobile learning (mLearning) is learning facilitated by mobile devices (Valk, Rashid & Elder, 2010). Mobile phones allow voice communication as well as the transfer of data. In 2015 in Africa, there were 685 million mobile-cellular subscriptions, which means that there were 73.5 mobile cellular subscriptions per 100 inhabitants (Development Bureau, personal communication, 2016). This is a significant increase from 246 million in 2008 and 500 million users in 2011 (Kasumuni, 2011). In Ghana, the number of mobile cellular telephone subscriptions was over 30 million in 2014, rising from over 25 million in 2012 (Telecommunication Development Bureau, 2016). Because of the ubiquitous use of mobile phones in Africa and their affordability, researchers such as Swaffield et al. (2013) and Ford and Batchelor (2007) explored if mobile phones could be used as a tool to support student learning and adult professional development. The Swaffield et al.

(2013) study is significant because to date education and SMS is largely absent from the research literature (Kidd & Murray, 2013; Valk et al., 2010). Often times, non-governmental organizations are the ones attempting to integrate SMS in education to support learning and professional development and enhance learning transfer (Walsh et al., 2013).

Text messages have also been used in American schools and higher education institutions to remind students of exams and deadlines (Quinn, 2015). In Nigeria, initiatives such as Efiko or Gedimo also use text messages to send review questions for tests. Text messages have also been used for collaborative projects or for communication during field trips (Motiwalla, 2007).

Finally, in a seminal meta-analysis study, Valk et al. (2010) examined the roles of mobile phones in developing countries in Asia by exploring six pilot projects in the Philippines, Mongolia, Thailand, India and Bangladesh. Specifically, the authors sought to understand if and how mobile phones (1) helped improve the access to education, and (2) enhanced new learning, which comprises the different learning processes and instructional methods. The findings from the pilot studies are meaningful with participants reporting having gained motivation from the SMS received. They also claimed that the mobile phones allowed them to quickly ask questions of the trainers and their peers. The authors conclude that mobile technology improved access. However, there was less evidence that mobile phones impacted new learning. In these six pilot studies, mobile phones were used for audio, games, videos, test taking, and talking with peers and trainers (Valk et al., 2010). To date, mobile phones used for teachers' and leaders' professional development in developing economies are largely absent from the

literature (Kidd & Murray, 2013).

The study considered in this paper examined how a post training mobile intervention assisted school leaders to transfer new knowledge to their schools after a professional development event. This concept could have a significant impact on schools as school leaders play a pivotal role in the overall success of their institutions and students' learning outcomes. The Millennium Development Goals (MDGs) and the Sustainable Development Goals (SDGs) both call for the Education for All. Mobile learning and particularly the adequate use of text messages in marginalized communities may allow school leaders and teachers to pursue their learning, network with others and engage in professional development anywhere, anytime and hence increase the sustainability of the school post training.

1.2. Research Question

This paper is part of a larger study, which sought to explore how, if at all, proprietors and head teachers of LFPs are able to transfer to their schools the newly acquired knowledge after attending a three-day leadership training in Burkina Faso and Ghana. Because Ghana is more technologically advanced than Burkina Faso, only Ghana received the mobile technology intervention. In this paper, I report the findings of the following research question: How, if at all, does the use of mobile technology after a leadership training in Ghana enhance learning transfer?

2. Methods

2.1. Selection of Research Sites and Participants

Edify, an international NGO, has been partnering with private schools in the developing world by providing financial loans to local micro-lenders who work with Low

Fee Private Schools (LFPSs). In 2009, Edify approached the University of San Diego's Global Center (USD) to create leadership modules that could be delivered in Ghana. These modules were designed to serve as an extra tool for school proprietors and directors of LFPSs who received a loan from Edify's local lending partners. The evidence-based training modules were created to provide culturally relevant and sustainable lasting changes in the leadership teams of the schools and provide low impact solutions to the education crisis. The four leadership modules addressed topics such as creating a culture of learning, issues of health and wellness in Ghanaian schools and challenges that school leaders face in terms of facilities and safety. The last module pertained to hiring, supporting and retaining quality teachers. At the end of each module, participants wrote a School Improvement Plan (SIP). The three-day leadership training was facilitated by local Ghanaian facilitators in Kumasi, Ghana in July 2016.

This qualitative exploratory study utilized a case study approach (Yin, 2014). Thirty participants from 15 different Edify school partners attended the leadership training. Out of this universe of schools, three schools were selected. Leaders of these school received a loan and also attended the entire three-day leadership training. The schools were located in Kumasi, Ghana. This research design relied on a purposive criterion and a convenience sampling of three proprietors and three head teachers of LFPSs. Criterion sampling was used, as participants were chosen according to their access to technology, their ability to attend the three-day school leadership training and to speak and understand the national language. Other criteria included the school's size and number of years the school was in operation. Selected schools met at least four of the five criteria below; however, the first three listed criteria were required:

1. School leaders had to have access to text messaging and hence had to have a Smart phone.
2. Completion by the proprietors and head teachers of the schools of the three-day school leadership training offered in July 2016.
3. Understanding, speaking and writing the national language, English.
4. Schools that have been in existence a minimum of three years.
5. Schools with at least 150 students.

2.2. Data Collection

Data were collected through an informal meeting, site visits before and after the training, in-depth interviews with schools' proprietors and head teachers three months after the training and the analysis of documents such as WhatsApp logs.

2.2.1. Initial Informal Meetings and Site visits. To build strong relationships, the initial meetings served to build trust and rapport between the researcher and the participants. Both the school proprietors and the head teachers attended the initial meetings. During the initial meeting, the researcher also asked for a tour of the school. The participants were then invited to complete and sign the Informed Consent Form that described the purpose of the study. These preliminary meetings happened in July.

2.2.2. Interviews. The in-depth interviews were the primary source of data for this study. Interviews included four proprietors and three head teachers for a total of seven interviews in Ghana. Interviews were semi-structured and open-ended and lasted 60-90 minutes. An interview guide was developed. The researcher asked open-ended questions such as "Tell me about any changes that have happened in your school since

the last training” and “What was helpful to make the changes?” Interviews were audio taped and transcribed verbatim in English.

2.2.3. Documents Analysis: Logs from the Nine Week Follow-up Interventions via Mobile Phones Text Messages. In this study, I sent conversation triggers twice a week using WhatsApp. WhatsApp allows anyone with access to a smartphone, data plans or Wi-Fi to send individual and group messages anywhere in the world. It also allows sending and receiving photos, videos, recordings, and Word documents. According to Quinn (2015) and in terms of communication, choosing the most effective technology is key as it may also increase student success and retention. For this research study, WhatsApp was chosen to follow up after the three-day leadership training for several reasons: (1) the school leaders engaged on WhatsApp prior to the training for administrative purposes with the Edify Ghanaian staff; (2) school leaders are busy and have limited time to meet face to face to follow up and increase their learning; (3) even those who were absent during the training were invited to join the WhatsApp group if they were present on the last day; (4) following up by email is more difficult in a marginalized communities where few people own a computer and there is a shortage of electricity on a daily basis; and (5) cellular data are affordable in Ghana and most school leaders were already using WhatsApp for their personal use. According to Ahlabenu (2018) WhatsApp is so pervasive in Ghana that is estimated that 90% of information flows through WhatsApp. Hence, WhatsApp was used to follow up post training, continue professional development, and create a community of learners.

The purpose of the WhatsApp group was to examine the extent to which mobile technology played a role in enhancing learning transfer. The WhatsApp platform was

used as a Professional Learning Community (PLC) for everyone who participated in the three-day leadership training in July 2016, provided that they were present on the last day of the training and had a Smart phone with the WhatsApp application. Everyone received the same message at the same time and was able to respond. I sent texts via group texting. Three days after the training in Kumasi, Ghana, the group “Kumasi WhatsApp Cohort July 2016” was created. To set up the group, everyone’s name and contact information had to be entered as a contact in my phone first. Then, the contact data were exported to the contacts into the WhatsApp application. To obtain accurate data and for better tracking, the group was intentionally set up so that the name of the participants as well as their schools appeared when they responded to the text messages. This set up allowed me to track who participated and who did not and to follow up if and when needed.

On the last day, the participants confirmed their contact information, provided the phone number they used for WhatsApp and agreed to be part of the PLC. A total of 23 participants were invited to join the WhatsApp group. The local Edify staff member in charge of education, as well as the two Ghanaian facilitators who conducted the leadership training, and the site director were also invited to the group as silent observers. The role of the silent observers was defined and explained to them before the intervention started. Later, I was able to ask the silent observers to read my findings, serving as member checkers.

As the moderator and administrator of the WhatsApp group, my role was to send the text messages twice a week, monitor the answers, provide some written or oral feedback and encouragement, and answer questions. I also ensured that the norms were respected and that the purpose of the PLC remained intact. The WhatsApp text messaging

intervention was introduced at the conclusion of the school leadership training on July 7, 2016. Norms for the group were discussed at this time. Norms included: (1) the group was created to enhance and promote leadership conversations only as to help enhance networking among participants; (2) the group should not be used for personal or other purposes; and (3) everyone was encouraged to participate in the discussions/reflections. I sent a first text message to the cohort inviting the participants to join the WhatsApp group five days after the end of the training. A reminder was sent on July 22nd to inform the participants that the intervention was starting on Monday, July 25th. Text messages were sent to the proprietors and head teachers for nine weeks starting two weeks after the school leadership training. The two-week grace period allowed participants to return to their school sites, share with colleagues, and reflect on the knowledge they had gained during the training. The intervention lasted nine weeks because four leadership modules were covered during the leadership training and I wanted to ask two follow up questions per module. On the last week of the intervention (week 9), I sought to receive the participants' perspectives on the use of WhatsApp as a follow up method. On Mondays the participants received a yes/no question and an open-ended question followed on Fridays of the same week. Participants could answer one question and not the other if they wished. There was a total of seven yes/no questions and nine open ended questions. The questions were all related to the content of the four modules taught during the three-day leadership training. This format was chosen to: (1) understand what kind of question triggered more participation; and (2) provide the participant a structure in which they could expect a yes/no question on Monday that gave them time to reflect in order to answer the open-ended question on Friday or over the following days. The questions used

for the follow-up text intervention are included in Appendix A. I asked questions directly related to the content of the four modules. An example of a yes/no question would be “Do you think your school is more inviting now as a result of the Edify leadership training you attended in July? Please respond YES or NO. Open ended questions included questions such as “Have you made your school more inviting this week? If you made any changes add any photos and/or videos of what you have changed. On the last day of the intervention, September 19, 2016, I informed the participants, through a text message, that the intervention was ending and asked them if they wanted to keep the group. All the participants responded that they wanted to keep the group active and one person volunteered to become the administrator of the group, allowing me to remain a group member without being the administrator/moderator.

2.4. Data Analysis

All digital recordings were transcribed verbatim and coded for recurring themes. The video clips and messages posted on the WhatsApp platform along with the WhatsApp log and the researcher’s field notes were analyzed. I used two cycles of coding. In the first cycle, I used In Vivo coding. In Vivo relies on the participants’ own words, looking for phrases that represent themes and it is useful to understand different cultures and worldviews (Saldaña, 2009). It was used to categorize emerging themes and reveal patterns that emerge from the data. Codes were developed for each key point identified in the interview transcripts and documents. The coding sought to inventory and define key phrases, terms, and practices that the people interviewed used to make sense of their world. The purpose of this second cycle was to “develop a sense of categorical, thematic, conceptual, and/or theoretical organization” (Saldaña, 2009,

p. 149), based on the first cycle coding. Axial coding was used in the second cycle coding. Axial coding aims at determining which codes in the research are dominant and the ones that are less important. During this cycle the “code is sharpened to achieve the best fit” (Glaser, 1978, p. 62).

2.5. Trustworthiness

Triangulation was used with several different sources of data such as the in-depth interviews, site visits and field notes, as well as the document analysis and the WhatsApp responses to the conversation triggers (Creswell, 2013). In addition, I went back to my Ghanaian colleagues for member checking.

2.6. Limitations

Due to the cost of conducting research internationally, I was only able to stay in Ghana for one week at a time, preventing me from looking at the sustainability of the learning transfer longitudinally. In addition, my sample was six school leaders in low-fee private schools. However, this study is significant as it examined low impact solutions to remedy the significant issue of maintaining the transfer of learning after attending a professional development event.

3. Results

The research question sought to examine how, if at all, the use of mobile technology after training enhances learning transfer. A total of 23 participants agreed to be part of the WhatsApp group by signing a consent form and providing their phone numbers at the end of the July training. Out of a universe of 23 people, 13 overtly participated by answering at least one of the seven yes/no questions or one of the nine open-ended questions. The seven yes/no questions yielded 42 answers and the nine open-

ended questions generated 22 comments. While the yes/no answers yielded more participation, the open-ended questions allowed participants to share rich answers, videos and photographs.

Out of six study participants, four participated actively in the intervention. This number is explained by the fact that there were three leaders from Akwaaba School at the July leadership training. Prior to the start of the WhatsApp intervention the leaders of this school decided that one person from their school would be communicating their collective answers on the platform. The other two leaders were reading and discussing the questions among each other but there was one spokesperson to report the school leaders' answers and contributions. Four participants commented 18 times on the seven yes/no answers and contributed 11 times to the nine open-ended questions. One person was particularly active answering all yes/no questions and missing only four of the open-ended questions. Overall the participants were very active and engaged in the conversation triggers.

The study participants unanimously stated that the WhatsApp intervention was helpful to transfer new knowledge after the training for several reasons. They commented that it allowed them to learn from each other, and it reminded them of the training, its content, and the School Improvement Plans. The intervention also encouraged and motivated the participants to put into action what they had learned during the training. One participant stated: "We were expecting your messages, so we knew we did not have time to seat down and relax, your follow up helped us to remember what we had seen in the training." Even those who did not know how to type stated that it was "brilliant and very helpful." One school leader shared: "WhatsApp helped me because I could read and

see what my colleagues were doing in their schools. I took some ideas and also got motivated by what some did.”

3.1. Network and Peer Learning

The use of WhatsApp allowed the workshop participants to share information and “encouraged those who were not responding to questions to sit up.” A woman leader added: “Comments from my colleagues always draw my attention back to what was learned at the workshop. The answers given were helpful and made us conscious of what others were doing. We got ideas and copied some ideas.” Most participants shared that they were happy to hear from colleagues after the training, keeping “the good atmosphere beyond the training.” Finally, one leader spoke of the fact that he learned vicariously and said “despite the fact that I never wrote anything on the platform I was reading all the messages and learned a lot from the others that way.”

3.2. Reminder, Peer Pressure, Motivation and Encouragement

All leaders suggested that being active on the WhatsApp platform was motivating because of the peer pressure. When leaders saw pictures on the phone of what colleagues improved in their schools, they would be inclined to do the same and share their progress on the platform. A leader shared: “When I see other schools making so many changes, I must make some too! I liked what some of my colleagues did and I must now try to do the same at my school. If they can do it, why can’t I, I must at least try and show them.” Another participant stated, “I do not go to the others’ schools but I see pictures they send and it helps me to change too.” Two other persons commented: “Usually after training, people feel reluctant to use what was learned but this gave us pressure and motivation and it always reminded us to do what we set to do.” Participants also commented on the

encouragement they would receive from other participants and from the group moderator when new learning was transferred: “We felt encouraged because you [the researcher] wrote to us and asked us more questions when you did not understand or wanted us to share more.”

3.3. Norms and Structure

All participants appreciated that the rules were clear and given before the intervention started. One leader referred to the norms as: “nothing to waste.” According to him the norms promoted learning by staying on task. Two leaders stated that people who did not respect the rules were “detractors” and they appreciated when I intervened and restated the rules immediately. He stated it in this way “Let us stick to the reason for what the group was created. Not everyone is a fan on what others are posting.”

All participants shared that they enjoyed the structure of the questioning and the quality of the questions. They enjoyed receiving a yes/no question on Mondays when it was busy and the open-ended questions on Fridays when they had the weekend to read, think and respond. “I was always eager to see what message you [the researcher] sent even if I could not look at work. I would go home and look at what you sent because I knew to expect a message on certain days and I knew I had time to think about the question before responding”.

3.4. WhatsApp Beyond the Training

After this intervention, all participants stated that WhatsApp should be used for all trainings. Two participants indicated that they would like to use WhatsApp in their own work and with their teachers, using the application to ask the teachers a few

questions prior to their weekly teachers' meeting. "I thank you because now I will use this with my teachers and this will force them to prepare effectively before a meeting." Participants also shared that since the training content was helpful and relevant to their context, they were willing to engage in the WhatsApp. One school leader claimed: "You see often times you go to training, but the materials is not appropriate for us and we do not learn anything. Here we learned because of new research you presented but also because you made is relevant to our needs and schools. That is why we wanted to continue the learning and sharing on WhatsApp."

The data indicated that participants perceived WhatsApp as being a useful tool to enhance the transfer of learning because it enabled them to learn from each other, reminded them of the workshop and of their school improvement plans and encouraged them in general. They shared that the pictures other leaders posted on the platform encouraged them to transfer learning to their schools, referring to it as peer pressure. According to the participants, WhatsApp appeared to be an efficient way to follow up with workshop participants post training. It helped participants remember the goals they had set for themselves and reminded them of the content of the training. WhatsApp was also appreciated because it is a platform the participants knew how to use, and it is readily accessible and available. One head teacher exclaimed "WhatsApp was a great idea to follow up with us because we use it already, we just never thought of using it among us educators and after a training." In the Ghanaian context, WhatsApp appeared to be a convenient pedagogical tool because it is widely used and provides a sustainable way of following up post training, learning from peers, and communicating.

4. Discussion

4.1. “WhatsApp was brilliant, it forced us to sit up”

As revealed in the subheading, participants appreciated the use of WhatsApp after the training. WhatsApp enhanced learning transfer in the Ghanaian schools because it encouraged the participants to put into action what they had learned during the training. Currently, the use of mobile technology as a follow up after a professional development event in order to improve learning transfer is absent from the current learning transfer literature. The WhatsApp intervention in Ghana allowed trainees to remain in contact with each other and share with each other via text messages the changes they had made in their schools after the training. One school leader, for example, shared on the platform pictures of a parent meeting he had organized at his school. The meeting aimed at educating the parents on healthy eating habits. Some participants complimented him on the initiative via text messages, others asked him questions on the initiative and a few participants did not say anything but copied his idea, as I later found out during the follow up in-depth interviews. This example illustrates that the participants were engaging each other in transformative discourse, allowing them to question their assumptions and gain new knowledge. This finding concurs with Mezirow’s Transformative Learning Theory (2000), in which critical reflection eventually leads to a transformation in perspective and new learning. This finding also reveals that learners learned from their peers not just during the training but also during the follow up mobile intervention, whether they overtly participated in the WhatsApp or just observed the dialogues. In the adult learning transfer literature, authors such as Caffarella (2002) spoke

of learning as being a social process and hence learning communities, collaboration and interactions among participants are crucial to learning and its transfer.

The importance of collaboration and participation between the facilitator and the learners is emphasized in Lave and Wenger's (1991) theory of situated cognition, which focuses on what they call *legitimate peripheral participation* (LLP). In LLP apprentices learn from experienced practitioners by first learning and practicing basic tasks. Through these activities, and with further collaboration with the experts, apprentices become familiar with their duties and better understand the community and its needs. LLP illustrates how collaboration is instrumental to learning and learning transfer and why facilitators need to employ this critical strategy. Using WhatsApp as a mobile platform to follow up post training allowed participants to learn from experienced school leaders and allowed the group to create a Community of Practice (COP). In a community of practice, people from the same profession share ideas and learn from each other through exchanges, observations or vicariously. COPs provide a way to sustain interactions and support each other over time (Cochrane, 2014). Since Ghana is a highly collectivist society, the creation of a WhatsApp group was an additional way to capitalize on that collectivism by providing a space for the school leaders to learn from their peers anywhere anytime. Without the follow up on WhatsApp, school leaders would not have been able to continue dialoguing with each other due to the long distances between their schools and the lack of time and resources to visit each other's schools.

The mobile intervention reminded participants of what they had learned and supports the literature that speaks of mobile technology as a way to remind students of content (Quinn, 2015). Participants also reported being motivated by the text messages

they received and by the answers their colleagues would post. This finding corresponds to the meta-analysis study by Valk et al. (2010), in which text messages were reportedly motivating the recipients to learn more and increased the access to informal education, as other researchers have found (Lai et al., 2007; Looi et al., 2010). This study also confirms Swaffield et al.'s (2013) findings in that texting could be a way to support the leadership capacity of school leaders, as it is the preferred method of communication. The text messages refreshed the knowledge acquired during the training and inspired them to do more at their schools.

Because culture affects learning (Caffarella, 2002), a concept that was not found in the mobile technology literature, and may be unique to Ghana, is the notion of peer pressure. All interviewees mentioned “peer pressure.” They stated that text messages and pictures shared on the platform allowed them to see what their colleagues were doing and forced them to do something as well. One possible explanation for this phenomenon is cultural. As previously mentioned, Ghana is characterized by a collectivist culture. Therefore, it is not surprising that seeing what others did on the WhatsApp platform motivated the other participants to do more for their schools. In this case, the peer pressure motivated the participants and sustain their efforts to transfer new knowledge to their schools.

Another concept absent from the literature is the importance of setting norms. This finding may be particular to Ghana as Ghanaians embrace structure and discipline. Participants spoke of their appreciation for having had norms and rules at the beginning of the intervention. They valued that the rules were enforced, and people were reminded

of them when they broke them. The interviewees also valued the structure of the questions, the timing, the wording and the presence of a group facilitator.

Based on the findings of this study and although some participants did not actively participate in the WhatsApp intervention, i.e., they did not overtly respond to the questions or did not post pictures and videos, their learning was vicarious. Learning happened through observations, reading and/or listening to the materials posted on the platform. The WhatsApp follow up intervention provided in this study targeted specific feedback to the participants and was used as a monitoring and coaching tool. Whether learning happened vicariously or not, the WhatsApp intervention stimulated learners and fostered new learning to occur. This finding coincides with Valk et al. (2010), whose study outlines that the use of mobile technology can promote new learning to occur. The concept of vicarious learning using text messages is a new contribution and important when trying to achieve the Sustainable Development Goals (SDGs) related to achieving education for all and equity among genders.

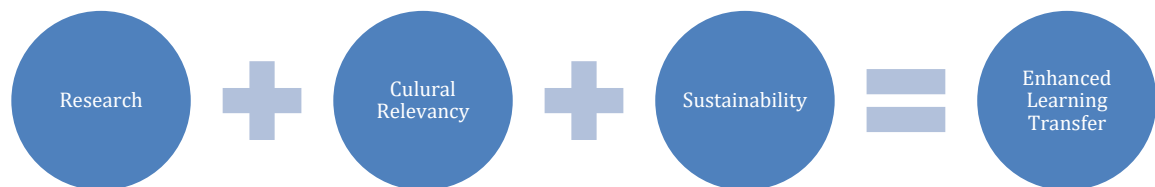
The findings from this study provide a tentative *Model of Learning Transfer*, as shown in Figure 1, that includes:

1. *Research*: a) Providing evidence-based materials, in which are embedded principles of learning transfer and adult learning theories.
b) Following up questions are based on content of the training and times for reflection are intentionally built in both the training and the follow up.
2. *Cultural relevancy*: The materials are contextualized for the audience targeted.

3. *Sustainability*: Using a contextually appropriate, readily available and free of charge follow up method to ensure continual and sustainable learning.

Items 1-3 propose *Enhanced learning transfer*. Combining the three components of this model suggest transfer of knowledge is enhanced and would allow school leaders to have a greater impact on teachers and student learning outcomes. Every year billions of dollars are spent in training, workshops and meetings, yet 10% of the new knowledge get transferred to the work place (Broad & Newstrom, 1992). Using this proposed model could guarantee that leaders would get a return on their investments as it would ensure that the time, resources and money they spend on training results in the transfer of new knowledge, ultimately improving student learning outcomes. This model would also help school leaders to bridge the implementation gap, in which they report having access to training but do not know how to apply the new knowledge. These findings support the value of implementing policies that support the use of mobile technology in all sectors such as education, medicine, social and government services in the developing world.

Figure 1. Learning Transfer Model



5. Conclusion

The mobile text messaging post training intervention appeared to be valued by the Ghanaian school leaders and head teachers. The use of WhatsApp seems to have contributed to transferring the new knowledge to the schools post training. WhatsApp helped the participants because it motivated them, encouraged them and it reminded them of the knowledge acquired during the training. The WhatsApp group also offered the participants networking opportunities. In addition, the mobile intervention allowed participants to learn vicariously by observing and reading the messages and photos posted on the platform. Networking opportunities enhanced by peer pressure from observing each other's progress assisted participants to transfer new knowledge.

This paper indicated that the use of mobile technology intervention post training such as WhatsApp could prevent training relapse, in which trainees lose their motivation

and/or the knowledge hindering the transfer of learning. Platforms such as WhatsApp or Viber allow for a higher level of interaction and follow up for locations otherwise not easily accessible to the trainers. This study also demonstrated that WhatsApp is one way to provide sustainable and affordable follow up after a training program.

6. Recommendations

6.1. Recommendations for Trainers and Practitioners

Because of the Millennium Development Goals (MDGs) and now the Sustainable Development Goals (SDGs), \$2.3 trillion has been spent on foreign aid in the last 60 years (Myers, 2011). To ensure that investments made do not turn into dead investments and that development initiatives are sustainable, the suggested *Model of Learning Transfer* provides a possible blueprint for efficient and successful program outcomes.

This study has shown how the tentative *Model of Learning Transfer* led to successful outcomes in Ghana, West Africa. Because of the affordable cost of data in Ghana (and West Africa in general), and because it is the preferred way of communicating for people who own a Smart phone, WhatsApp or any other platforms should be systematically used post-training to follow-up after a professional development activity because the application is free of charge. WhatsApp allows for everyone to have access to knowledge anytime, enabling men and women to learn equally at their convenience. To efficiently use WhatsApp or any other platforms with a group of trained people, the following steps are important to consider:

1. Create a handbook for the moderators of a virtual platform such as WhatsApp. This handbook could include examples of group norms, questions, responses, conversation triggers, and feedback as well as examples of prior conversation that yielded learning and transfer. The handbook would also explain how long a group should be in existence based on its purpose and how to end it when needed.
2. Choose and coach group moderators who are knowledgeable about the culture in which they work. The coaching would include: understanding how to set up a WhatsApp group, outlining the purpose of the group and its rules, as well as communicating with the group a list of prerequisites. For example, one has to have a Smart phone with the WhatsApp application loaded on their phones. Other information would include details on how to use WhatsApp, how to type on the phone, and provide resources for those novice participants who are not technologically savvy. The moderator would then pose a series of questions on a determined schedule with a specific set of questions or conversation triggers, allowing time for reflection based on adult learning principles (Mezirow, 2000). It may also be the case that the moderator just posts some articles, videos, or audio messages depending on the goal of the group. Ideally the messages are varied between text, audio, and video.
3. It may be beneficial for the moderators to ask that participants set up alerts on their phones because in Africa most people have several phones, which can lead to message overload or forgetting to check messages on a particular device. These alerts would notify the group members when a message arrives

Additionally, the learning transfer literature clearly states that follow-up post-training is needed in order to prevent relapse. The follow-up can take several forms: whether it is through establishing a Special Interest Groups (SIG), a Professional Learning Community, or whether it is through virtual coaching using Skype, WhatsApp, or any other virtual platforms. The follow-up could contain several mediums depending on its purpose. The follow-up could include questions such as the ones used in the mobile technology intervention in this study or via virtual quizzes based on the training content. Funders, policy makers, governments and supporters of development initiatives who work in similar environments as the one in Ghana, could also learn from this study as they fund training programs and other professional development activities.

6.2. Recommendations for Future Research

Future research should consider the applicability of the tentative *Model of Learning Transfer* longitudinally with the same Ghanaian school leaders. Further research could be conducted with school leaders from other rural and urban areas in Ghana. Other research studies could also investigate how a platform like WhatsApp could be utilized using different modes of communication, whether it is sending audio text messages, sending videos, links to articles for trainees to read, or even using the WhatsApp new feature: video calling.

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Appendix A

Follow-Up With Mobile Phone Intervention Questions

Purpose: To examine how if at all the use of SMS enhances learning transfer.

1st week:

- **Monday of intervention:** Do you think your school is more inviting now as a result of the Edify leadership training you attended in July? Please respond YES or NO.
- **Friday:** How have you made your school more inviting this week? **If you made any changes add any photos and/or videos of what you have changed.**

2nd week:

- **Monday:** Do you think your school facility/ campus is better now as a result of the Edify leadership training you attended in July? Please respond YES or NO.
- **Friday:** What have you done since the training to improve your school facility/ campus?

3rd week:

- **Monday:** Do you think the recruitment/induction process at your school is better now as a result of the Edify leadership training you attended in July? Please respond YES or NO.
- **Friday:** What have you done since the training to improve the recruitment/ induction of quality teachers at your school?

4th week:

- **Monday:** Do you think your school is unique? Please respond YES or NO.
- **Friday:** What have you done since the training to make your school unique that would cause parents to want their child to attend?

5th week:

- **Monday:** At your school, have you seen more evidence of student learning now as a result of the Edify leadership training you attended in July? Please respond YES or NO.

- **Friday:** What have you done since the training to improve student-learning outcomes?

6th week:

- **Monday:** Do you think your quality teachers will remain at your school? Please respond YES or NO.

- **Friday:** What have you done since the training to keep quality teachers in your school?

7th week:

- What healthy food will your school serve/are you serving for this new year?

8th week:

- In what ways will you help your teachers and students make healthier choices in the new school year?

9th week:

Was the WhatsApp group helpful to you? Why and How?