Elimu kwa Teknolojia

programu ya BRIDGE*it*

BRIDGE*it* Tanzania

A Qualitive Analysis

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The Open University of Tanzania

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CONTENTS

Executive Summary 2
1. Background 4
2. Objectives 5
3. Methodological Context 5
The Geographical Setting of the Study 5
Respondents 7
Data Collection 9
Approaches Used in Field Study for Data Collection 8
4. Findings 9
Leadership, Coordination, and Management Regional and District Levels 9
Leadership, Coordination, and Management at the School-level 10
Impact on Teaching and Learning 11
Impact on Performance 11
Impact on Attendance 12
Teacher Training, Support, and Retention 12
Budgetary Support, Resource Mobilization, and Financial Sustainability 14
Technology Maintenance and Support 15
External Factors 15
5. Conclusions 17
Teaching and Learning at the School Level 17
Roles and Contributions of Project Actors at the Classroom Level 17
Potential for Scale Up 18
Challenges 19
6. Recommendations 19
Appendix I. Guiding Questions: Head of School 21
Appendix II. Guiding Questions: BridgeIT Teachers 24
Appendix III. Guiding Questions: Focus Group Discussion 27
Appendix IV. Observation Guide at School and District Offices 29

Executive Summary

In 2007, the International Youth Foundation (IYF) implemented BridgeIT in 150 pilot primary schools in Tanzania. The program was conducted in partnership with the International Youth Foundation (IYF), the Tanzania Ministry of Education and Vocational Training, the Forum for African Women Educationalists (FAWE), Nokia Siemens Networks, Vodacom Tanzania, and the Pearson Foundation. The U.S. Agency for International Development funded the program. The goal of the BridgeIT program is to significantly increase educational quality and achievement among primary school students in mathematics, science, and life skills through the innovative use of cell phones and digital technology.

A quantitative evaluation of BridgeIT (BIT) by Enge (2011) provided a mixed picture of success and challenges in attaining the desired objective. A comprehensive qualitative analysis was needed to better understand why. Therefore, in collaboration with BIT, the Open University of Tanzania conducted the qualitative study of BIT schools in all four BIT educational zones in Tanzania. These included the Southern, Coastal, Central, and Northern zones. Two schools from each zone were chosen to participate in the study except in the coastal zone where a total of four schools were taken because this region covers almost 50% of the BIT schools. These schools were selected based on their region and level of performance using the MOEVT school rating system. The sampled schools included both the higher and lower levels of performance.

The specific objectives of the qualitative study were to:

- Evaluate the extent that BIT actors understood the BIT model of educational delivery from program documents and descriptions;
- Identify factors influencing the mainstreaming of the BIT model at the school level;
- Assess the contributions of project actors of at school level (classroom setting) and evaluate their role in promoting gains in learning;
- Identify other factors (not related to the BridgeIT model) that may affect academic performance in BridgeIT schools, if any; and
- Explore the potential for building on identified strengths of the program to expand the program both in scope and scale.

The study sample, selected by using both purposive and random sampling techniques, included district education officers, focal persons, master trainers, head teachers, BIT teachers, and BIT

students from all the selected schools and regions, for a total of 100 respondents. Data was collected through desk research and fieldwork involving focus group discussions, personal interviews, and the observation checklist.

The study revealed that BIT training programs equipped stakeholders with knowledge and skills on BIT program. The program also motivated both teachers and students to improve performance and increase attendance.

The survey found that school performance was affected by the following factors:

- level of collaboration among teachers at school
- geographical location of the school
- presence of other educational programs that complement BIT
- departure of trained BIT teachers
- regular, working technology, particularly energy sources
- teacher–student ratio
- presence of remedial
- frequent visits by the government officials to BIT sites
- community readiness and commitment

Finally, the study yielded recommendations for improving the program. These recommendations include the need to take BIT to scale, to ensure a sustained supply of power, to ensure that relevant video clips are prepared for all subjects and topics, to ensure that head teachers are selected with care, and to ensure that regional and district education administrators provide timely advice and support for innovations that promote effective teaching and learning in all schools.

1. Background

Information and communication technologies (ICT) are increasingly employed to facilitate teaching and learning at all levels of schooling. Improved quality of learning, technology-related costs, and enhanced access to education are key to assessing the appropriateness of the technologies in the school environment. BridgeIT (BIT) deploys cell phones and digital technology to enhance the

quality of instruction and improve student achievement in primary school learners in mathematics, science, and life skills.

Kukulska-Hulme (2005) noted that mobile phones could contribute to teaching and learning processes, primarily because mobile technology allows learning to be spontaneous, personal, informal, contextual, portable, ubiquitous, and pervasive. In addition, such technology enables education through speaking, texting, accessing the Internet, and using camera, video, and radio features. BIT technology goes beyond e-learning and into mobile learning (m- learning), which can make learning accessible, inexpensive, interesting, and convenient.

BIT results from a partnership involving the International Youth Foundation (IYF), the Tanzania Ministry of Education and Vocational Training, the Forum for African Women Educationalists (FAWE), Nokia Siemens Networks, Vodacom Tanzania, and the Pearson Foundation. BIT was implemented in Tanzania in 2007 based on the successes of a similar program in the Philippines. BIT was piloted for a two-year period with funding from USAID/Tanzania. It was then extended for a 15-month period to December 2010, and later, through March 31, 2012.

Since its inception, BIT has reached over 100,000 school children and teachers. According to the quantitative evaluation full report by Enge (2011), BIT had a mix of successes and challenges in attaining program objectives. As a follow-up to the quantitative evaluation, a comprehensive situational analysis was needed to better understand effective and efficient strategies to promote high levels of student performance.

In collaboration with BIT, the Open University of Tanzania assumed the lead in organizing and conducting a qualitative evaluation of the program, designed to understand the factors influencing the levels of performance in the sampled primary schools. In the educational context, the program evaluation has long been a useful technical tool for determining whether programs are meeting their established goals. This evaluation assesses the school and macro-level factors contributing to BIT student performance, with the goal of helping educators and administrators understand effective strategies for implementing BridgeIT or related teaching and learning technologies in Tanzania's primary school classrooms.

2. Objectives

The overall objective of the study was to conduct a comprehensive qualitative evaluation of BIT, with a view toward understanding factors that influence the level of performance in teaching and learning through the use of BridgeIT based digital technologies in piloted schools.

The specific objectives of the qualitative study were to:

- Evaluate the extent that BIT actors understood the BIT model of educational delivery from program documents and descriptions;
- Identify factors influencing the mainstreaming of the BIT model at the school level;
- Assess the contributions of project actors of at school level (classroom setting) and evaluate their role in promoting gains in learning;
- Identify other factors (not related to the BIT model) that may affect academic performance in BIT schools, if any; and
- Explore the potential for building on identified strengths of the program to expand the program both in scope and scale.

3. Methodological Context

The Geographical Setting of the Study

BIT was implemented in 150 schools. Four of seven Tanzanian educational zones were selected for the study: the Southern, Coastal, Central and Northern zones. Two schools from each zone were chosen to participate in the study except in the Coastal zone where as four schools were selected (see box 1). These schools were selected based on their region and level of student performance, as measured by the MOEVT school rating system.

Table No 1. **Schools Included in the BIT Qualitative Assessment**

Zones	School	Level of Performance
Coastal	Bunju	Low
	Manzese	High
	Mdaula	Low
	Nianjema	High
Northern	Mawenzi	High
	Mwereni	Low

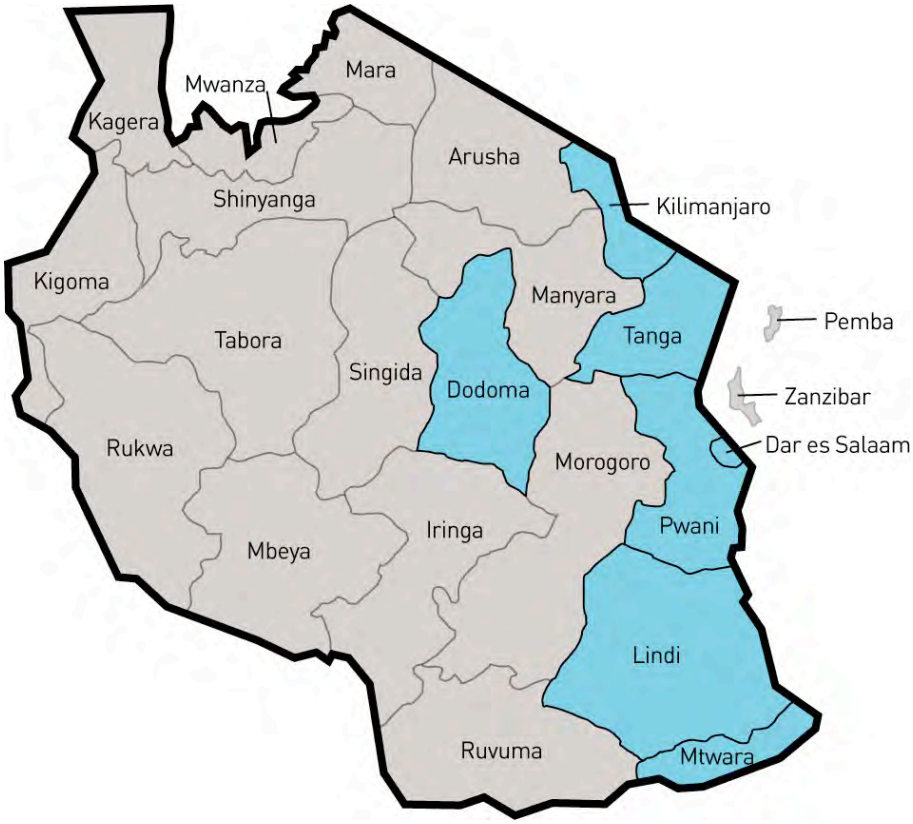
Central	Chinangali	High
	Weyura	Low
Southern	Mtama	High
	Kitomanga	Low

MOEVT has established a new system for visiting and inspecting schools, in which the frequency of visits and inspections are determined by school performance. Letter grades determine the frequency and urgency of visits and inspections. For instance, schools with A grades are visited once per year, and they receive critical inspection once every four years. However, heads of schools are provided with self-inspection forms so they may evaluate themselves in the interim. In contrast, schools with poor and satisfactory performance receive particular attention, and yearly visits and inspections are sometimes unannounced.

MOEVT rates student achievement according to percentages, as follows:

Percent	Letter grade equivalent	Performance rating equivalent
81–100	A	Outstanding
61–80	B	Very good
41–59	C	Good
21–40	D	Satisfactory
0–20	F	Poor

FIGURE 1. Regions with BridgeIT Schools?



Respondents

The study population included district education officers, focal persons, master trainers, head teachers, BridgeIT teachers, and BridgeIT students from the selected schools and regions. Respondents (except for students) were selected by virtue of their readiness and responsiveness in the implementation of the BridgeIT program. Regarding students, purposive sampling combined with random sampling techniques were employed to get an equal number of boys and girls at each selected primary school. The actual sample of respondents represented the characteristics of the whole population involved in the study in relation to their respective categories (see table 2).

Table 2. Study Sample Composition

S/No.	Category	Projected	Actual	Shortfall
1	DEOs	5	5	-
2	Focal Persons	5	5	-
3	Master Trainers	5	5	-
4	HTs	5	5	-
5	Teachers	20	17	3
6	Students	60	60	-
Total	**All Sample Size**	**100**	**92**	**3**

Source: Field Survey, 2011

Data Collection

Data was collected through desk research and field research. Desk research involved a review of program documents, including quantitative evaluation reports (Enge 2011), as well as policy frameworks, studies, and other publication related to the study.

Field research consisted of in-depth discussions with BridgeIT participants in consultative meetings, personal interviews, and open discussions. A mixed approach in data collection was used in order to supplement information already available and to improve validity and reliability and to confirm results.

Approaches Used in Field Study for Data Collection

For the purpose of this study, personal interviews, focus group discussions, and checklists were key sources.

Personal Interviews. An interview schedule was used to collect information from the district education officer, focal persons, master trainers, head teachers, and school teachers. Interviews are potentially a rich source of detailed information on the subject matter. Open-ended questions were used to guide discussions (see appendices I and II). The researcher posed the questions sequentially recorded information provided by the informants for further processing and analysis.

Focus Groups. This approach was employed to minimize tension that would have been expected when a researcher faces students in one-on-one interviews. Focused group discussions were held with the students from Standards V and VI. Respondents were given an opportunity to simultaneously offer their views about the implementation of the BridgeIT program. To guide the discussion, several questions were prepared in advance (see appendix 3). The researcher posed questions and left discussants free to reply to the questions one by one. The researcher recorded the information provided by the students for further processing and analysis.

Observation Checklists. The General Observation Checklist was employed in the study to collect information on the BIT classroom arrangement (see appendix 4). The Specific Observation Checklist was used to collect data on the availability of BIT documents and guidelines, teacher attendance registers, subject logbooks, lesson plans, and other records.

To maintain consistency, some of the data collection tools applied in the quantitative study (Enge, July 2011) were also employed in the qualitative study. These included the Observation Checklists and interview schedule. However, some of modifications were required. For example, whereas the checklist used closed questions in the quantitative study, the current study used open-ended questions. Furthermore, the magnitude of the data to be collected also necessitated modifying tools. The former study collected much more data than the current study.

4. Findings

Leadership, Coordination, and Management Regional and District Levels

When the key BIT actors at the regional and district levels were asked if they had a clear understanding of the logistics of implementing the program in the classroom, in almost all cases respondents indicated that they had received several training courses. The training was conducted prior to program inception and even during the implementation stages; hence, respondents felt prepared to perform their duties related to implementing the BIT program. Study data showed that all key actors in the primary school curriculum implementation were involved in seminars. These included regional education and academic officers, district executive directors, the district education officer, district education statistics and logistic officers, district academic officers, and the school inspectors (focal persons and master trainers).

One of the focal persons from Lindi region involved in the induction course said, “Without the induction seminars, it would have been very difficult for school inspectors and other district functionaries to oversee and ensure that this program was successful. The seminars have provided such knowledge and skills that education personnel at the district level are now fully prepared to supervise and provide due advice related to the BIT initiative.”

A newly appointed DEO in the Kinondoni district in Dar es Salaam city said, “When I reported to this district for duty I found out that the project had already started in 2008. After attending the related seminar, I got an understanding of the program. Consequently, I am able to support it.”

Furthermore, apart from the training on BIT implementation, data showed that the BIT team also held community awareness meetings to introduce the program to the community and to gauge community readiness to be involved in the program. Only schools that demonstrated at least partial readiness to participate in and make contributions to the program (such as preparing suitable classrooms) were provided with the program equipment.

Leadership, Coordination, and Management at the School-level

Findings indicated that all the surveyed schools had been engaged in BIT for three years. Classroom teachers received BIT training before the other categories of participants from the district and regional level. In almost all cases, the BIT teachers had received up to three training courses, each lasting three days. The training courses were run before and after the inception of the program. One respondent said, “I have attended the BIT training course twice. The first one was conducted before we started teaching in the BIT mode. The facilitators imparted knowledge and skills on how to teach by integrating video clips through TV monitors and special cellular phones.”

Overall, respondents indicated that BridgeIT program documents imparted sufficient knowledge and skills on how to carry out the BIT project and had been effectively provided to all key BIT actors. The school-level personnel surveyed felt that the BIT program at school level was following procedures for running the program, documenting progress, and storing equipment.

The BridgeIT team at the school level consisted of science, math, and life skills teachers. (In some schools, such as Manzese and Chinangali, BIT teachers trained their peers who taught other subjects.) Teachers remained on the BridgeIT team as long as they were engaged in science, mathematics, and life skills. There was a tendency for teachers at Bunju A to swap subjects so that other teachers could participate in the project, while the core project staff taught others classes, and, in doing so, updated their knowledge across Standards I–VII (grades 1-7).

At the district level, the BIT focal persons were more active than education officers in the implimentation of BridgeIT activities. Apart from BIT, it was uncommon to see these officers—especially district education officers and school inspectors—in the schools. Kinondoni Municipal Council provided close supervision to the schools under the project. The Council established a person to contact when schools had issues that required municipal attention. Manzese, as a BridgeIT model school, served as a center for celebrating fifty years of national independence for Mainland Tanzania (Tanganyika). As a BIT training center, the school has reported the highest of frequency of visits by national, regional, and municipal officers. BIT has therefore contributed to promoting interest in the schools by national, regional, district leaders, and even ward officials, and can be seen to promote a concern for high-quality, effective teaching and education in general.

Impact on Teaching and Learning

The study learned that the BIT approach had further increased the student interaction with subjects, thereby reducing student – teacher interaction. Through BIT technology, students interacted with the subject matter through watching video clips on academic topics on a TV monitor. After viewing the lessons, the students engaged with the teacher to answer various questions. In this aspect, the BIT teaching and learning approach was found to be more student-centered than the traditional approach to learning. For example, one BIT teacher from Chinangali primary school remarked that the BIT teaching and learning approach raised the level of student concentration compared with concentration levels before BIT.

Impact on Performance

Although in a number of schools learning was to some extent good prior to the introduction of BIT, there was a significant increase in performance with BIT, particularly among schools with a previously high performance. The increase in performance was reflected in student examination

results which was indicated on the schools notice boards and in the examination results documents. In several primary schools—Mtama, for example—general performance improved following the implementation of BIT. What's more, girls, who were said to lag behind boys prior to BIT, improved academically after BIT. Documents indicate that, in some cases, girls on average were found to be performing better than boys.

The research established that there was a positive trend on school performance following the introduction of the BIT approach to teaching and learning. BIT has contributed to shaping the way teachers approach lesson planning, choose the teaching aids, and teach on a day-to-day basis. Most teachers interviewed felt that the BIT program was more effective than the traditional teaching methodology. Significant improvement is notable in the teaching of science and mathematics.

Impact on Attendance

BridgeIT improved the teaching and learning to the extent that pupils were more encouraged than ever before to attend classes. Respondents reported this experience in all ten schools surveyed. Attendance in schools—especially in the BIT classes and subjects—increased significantly. The data collected from one BIT class attendance register at "A" stream at Bunju A, for instance, indicated that the stream has over 140 students with a minimum attendance of 133 pupils, up from fewer than 60 prior to BIT. As result of increased attendance, in schools with poor infrastructure, such as Bunju A, boys scrambled for better positions in classes, leaving girls at a disadvantage. This circumstance forced teachers to reorganize classes for improved equity in learning and participation.

Teacher Training, Support, and Retention

Master trainers under the project made significant contributions to the success of the program. They organized seminars and visited schools, enabled BIT teachers to build confidence, receive on-the-spot advice in classroom situations, and organize internal peer seminars for other teachers under the project and even in relation to other subjects. Master trainers visited the schools frequently, and these schools became model schools as the trained teachers continued to gain more BIT-related knowledge and skills.

The survey of government officials visiting Manzese indicated that the BIT approach also affected the quality of education. Data show a positive trend in school performance following the introduction of BIT. Manzese primary school became a model school for the BIT program, which resulted in frequent visits from government leaders. The school was consequently chosen as a center for BridgeIT teaching and learning technology. Although the BIT curriculum is for Standards V and VI, BIT principles are being applied across the school, especially for Standards IV and VII, to support preparations for national examinations. In some cases, other subjects are also brought on board, especially life skills sessions, which cut across many subjects. In most schools, the BridgeIT approach is had spillover into other subjects and classes. This phenomenon was notable at Manzese and Mwereni.

Demonstrated partnership and reciprocal collaboration among teachers promoted and sustained learning. In the schools where teachers demonstrated high collaboration and imparted skills to each other, such as at Chinangali and Nianjema, the BIT program progressed well. In schools where there were indicators of low teacher cooperation, such as at Kitomanga, the program was at the risk of failing.

It was also observed that in some cases problems related to BIT implementation were beyond the ability of school management to handle. This occurred primarily because of the departure of trained BIT personnel. For example, it was reported that at Mtama—a school with good performance—all of the four trained teachers had left the school for further studies in colleges and universities. However, district leadership had been slow to fill these vacancies, so the BIT program was not implemented in as planned. Thus, although Mtama had been a well-performing school, it began to perform poorly.

Members of school management committee during BridgeIT awareness and capacity building workshops, Kibaha, September 2011.

Budgetary Support, Resource Mobilization, and Financial Sustainability

The respondents expressed their views about BridgeIT in terms of provisions for funding, mastery in the use of required equipment, school inspections, and program guidelines. The study indicated that BIT enjoyed support from community leaders in which the pilot school was located. Kinondoni District Councilors and other leaders were invited to attend awareness seminars related to the program on a number of occasions. The resulting campaign to expand the program had such support from the community that a budget line is being considered to ensure that all schools across the municipality are included in the BridgeIT model of education delivery.

Community responsiveness and support was also shown in Dodoma, where the focal person was the impetus for fundraising to expand the BIT program to other schools. In Dodoma, head teachers contributed funds for purchasing the equipment needed to expand the BIT program. Kitomanga school also reported that it enjoyed the support obtained from a Mchinga Constituency Member of Parliament, who financed the purchase and installation of a battery for the solar source of power to enable the supply of electricity to the BridgeIT room.

Other schools such as Mwereni and Nianjema reported having support from the school management committee. The committees in these schools asked parents to support the school expansion of BIT.

As a component of the Education Sector Development Program under Primary Education Sector Development, Tanzania's primary schools receive capitation grants to improve the quality of education by improving teacher pedagogical skills, increasing teaching and learning resources, and providing support for teachers. At Mwereni Primary school, it was noted that, in addition to the capitation grant, parents also raised funds for school improvement. At this school, there was also donor funding specifically targeting support for children with special needs in education to improve their learning achievement.

Technology Maintenance and Support

Technology-based problems also contributed to the failure of the project in some areas. This was the case with Mwereni and Kitomanga primary schools, where BIT had not been in operation for some time due technological problems. For example, at Mwereni, the program had ceased operation in September 2011 as a result of the malfunctioning of the project mobile phone, which might have been caused by a virus and easily repaired. Similarly, BIT stopped operating in Kitomanga in July 2012 because of a technical problem.

External Factors

School Characteristics.

Non-BridgeIT factors that could influence academic performance under the BIT initiative included geographical location of the school (such as whether the school was in a rural or urban setting) and the school's distance from the regional or district headquarters where support services were easily accessed. It was observed that the distance from the regional or district headquarters to the school affected the successful implementation of BIT in terms accessing support and advisory services for classroom teachers. All the schools that were located near the centers of business such as Manzese, Nianjema, Mawenzi, and Chinangali met the criteria for good performing schools, while most of the schools in remote areas such as Chinangali, Weyula, and Mdaula found themselves categorized as poor performing schools.

A classroom's teacher–student ratio was also associated with school performance. Schools that had 50–70 students per teacher, such as Chinangali and Manzese, performed better than Weyula and Bunju, which had up to 140 children per class. The effect of overcrowding was exacerbated by a lack of desks, such as in Weyula, Mawenzi, and Kitomanga, which necessitated that many children stand or sit on the floor during the lessons.

Educational Programs that Complement BridgeIT

In the effort to establish whether the BridgeIT model was effective in enhancing school performance, it was important to identify and understand the presence, extent, and coverage of other programs intended to improve learning and teaching in the schools under the program pilot. With the exception of Mtama, Kitomanga, and Mwereni, schools had no educational programs running alongside BIT. Mtama had *Sports Development Aid,* which provided sports facilities to schools in the Lindi region to improve mental health and thereby enhance learning.

Mwereni had a program that used assistive technology with learners with visual impairment, coupled with support for children with albinism. This ICT-based project had a computer laboratory with Internet access. The school had about 20 desktop computers fitted with special software for text enlargement, Braille printing, and photocopying. The school had a solar electricity supply, which also supported the BridgeIT room. The project, like that at Mtama and Kitomanga, targeted Standard I–VII pupils.

In all surveyed schools, library use was rare. At Nianjema primary school, students were encouraged to use the library during their free time for private study. Teachers brought library references to class as part of their teaching resources, and pupils were encouraged to borrow books. In so doing it was expected that learning was enhanced and this improvement could be detected in the results of the final examinations as they were found in the examination results documents.

5. Conclusions

The BIT education delivery and learning mode was positively accepted by teachers, administrators, and quality controllers as a strategy that encourages and promotes learning for both boys and girls. BIT simplified teaching and promoted equity in educational achievement in targeted subjects.

Students indicated that it was easy for them to master both simple and difficult subject content; moreover, they enjoyed participating in BIT activities and using technology-based learning modes. For example, through this approach children were enabled to see the way the heart works in a more realistic way, via animated video, than it was in the traditional approach and teaching material. Both students and teachers in the BIT program report high morale.

The following sections describe key conclusions related to promoting BridgeIT, key stakeholders and project actors, and the potential for scaling up the intervention.

Teaching and Learning at the School Level

In both high- and low-performing schools, management, commitment, and degree of coordination among school leadership and teachers were among the factors influencing the promotion and mainstreaming of BridgeIT teaching model at school level. For example, the head teacher of Chinangali ensured that the BIT approach was effectively implemented to the extent that she was ready to provide financial assistance when the need arose. This commitment helped the school become a well-performing school. On the other hand, schools with poor performance were found to be characterized by poor management and poor coordination from school leaders. At Kitomanga primary school, for example, the solar power system required to operate BIT technology was nonfunctional, and the part needed to fix the system had been on order for more than six months, and key actors were unable to effectively manage the situation.

Roles and Contributions of Project Actors at the Classroom Level

The survey found that program actors from the district to the classroom level had an influence in enabling learning to occur in science and mathematics. At the district level, for example, it surfaced that although various education officers were involved in one way or another, there was always one officer who remained as a link between the district and the project schools to provide needed advice and supervision, with particular focus on training of trainers for BIT.

Similarly, BIT master trainers made significant contributions to the program's success. Their organization of seminars and visits to schools enabled the trained teachers to build confidence, to receive on-the-spot advice in classroom situations, and to organize internal peer seminars for other teachers in BIT subjects and even in other subjects. The schools frequently visited and encouraged

by the master trainers became model schools as the trained teachers continued to gain more BIT-related knowledge and skills.

The BIT classroom teachers had the greatest impact on the successful implementation of the initiative at the classroom level. Teachers were involved in BIT lesson planning and preparation, teaching, and regulated learning. However, in almost all cases, the head teacher served as the school custodian of the resources for the program, and teachers did not have the projects documents unless the head teacher provided them.

Potential for Scale Up

The survey sought information about bringing the BIT program to scale. The survey found that the BIT program is associated with improved trends in school performance, particularly in the teaching and learning of science and mathematics. BIT has contributed positively toward shaping teacher approaches in planning lessons, selecting resources, and daily teaching routines, and the program has improved academic performance for both girls and boys. For example, in Mtama and Nianjema, girls' performance in mathematics and science has improved significantly as a result of interventions under this program, and girls are some of the best performers in BridgeIT classes.

The survey found that student preference for watching TV and using cellular phones can be directed toward education. BIT technology helped minimize truancy among youth, especially in urban schools, which has greatly improved the internal efficiency of piloted schools.

Community support was another crucial element of success, and, as reported above, the survey found concrete measures of support from communities for the BIT initiative. Successful BIT schools can serve as exemplars for expansion of the BIT model.

Challenges

The study identified needs for:

- Committed leadership and coordinated school management skills.
- Improved power supply and mobile phone network connectivity, as well as for improved provision and clarity of video clips.

- An adequate number of BIT rooms to reduce time wasted in changing classes. It would be more efficient if there could be one BIT room for standard V, and another for standard VI.
- Affordable technology, as the required televisions, cellular phones, security hardware, and the like are too expensive to equip all primary schools in the country.
- Expanding BIT beyond the project schools to all schools, and to subjects beyond science and mathematics
- Additional trained teachers to master the BIT model and to use it alongside conventional and contemporary teaching methodologies.
- Sustained stability, primarily through limiting the transfers of teachers under the BIT program.

6. Recommendations

1. Expand the BIT teaching and learning approach from its current level involving a few schools and a few subjects to a macro level involving all school subjects, all teachers, and all schools in Tanzania.
2. At national, regional, district, and school levels, ensure there is a sustained supply of power to enable BIT technology to run smoothly. All equipment for the program should be supplied by certified and accredited firms that provide guarantees for regular maintenance and repair of the equipment including regular replacement of parts.
3. Include teacher orientation as a component of implementing innovative approaches to teaching and learning, and conduct awareness campaigns involving administrators, school inspectors, and conventional teacher trainers.
4. Require curriculum writers to ensure that, for all subjects and topics, relevant video clips are prepared in line with BIT innovation and made available and are in good working order.
5. Select head teachers with care and train them to ensure they have the skills to coordinate teaching and learning, build teams, and nurture relations with other teachers and parents through school committees.
6. Ensure that regional and district education administrators can provide timely support, supervisory, and advisory interventions to ensure effective teaching and learning in all schools.

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Appendix I. Guiding Questions: Head of School

1. How long has your school been implementing BridgeIT program?

   1 year ☐ 2 years ☐ 3 years ☐ 4 years ☐

2. How do you rate your general school performance before BridgeIT?

   Excellent ☐ Very good ☐ Good ☐ Bad ☐ Very bad ☐

3. How do you rate your general school performance after BridgeIT?

   Excellent ☐ Very good ☐ Good ☐ Bad ☐ Very bad ☐

4. How do you rate your school performance before the BridgeIT implementation specifically regarding both the program targeted classes (V & VI?) and targeted subjects (science and mathematics)?

   Excellent ☐ Very good ☐ Good ☐ Bad ☐ Very bad ☐

5. How do you rate your school performance during the BridgeIT implementation specifically regarding the program targeted classes (V & VI?) and targeted subjects (science and mathematics)?

   Excellent ☐ Very good ☐ Good ☐ Bad ☐ Very bad ☐

6. Regarding question 5, what factors contribute to this level of performance?

   i. ……

   ii. ……

   iii. ……

7. Does the School Management Committee actively support the school in implementing BridgeIT? Yes ☐ No ☐ Sometimes ☐

8. What kind of the support does the school management provide?

   i. ……

   ii. ……

   iii. ……

9. How many times did the DEO visit your school per term before BridgeIT?

   Once ☐ Twice ☐ Rarely ☐ Never ☐

10. How many times did the DEO visit your school per term during BridgeIT?

    Frequently ☐ Once ☐ Twice ☐ Rarely ☐ Never ☐

11. Does the DEO actively support the school in implementing of BridgeIT?

    Yes ☐ No ☐ Sometimes ☐

12. What kind of the support did the DEO provide to the school before BridgeIT?

    i. ……

    ii. ……

    iii. ……

13. What kind of the support does the DEO provide to the school to support since the start of BridgeIT?

    i. ……

    ii. ……

    iii. ……

14. How often does the school get a visit from school inspectorate department?

    Frequently ☐ Once ☐ Twice ☐ Rarely ☐ Never ☐

15. Is there any other education program, other than BridgeIT, in your school? Yes ☐ No ☐

16. If the answer to question 15 is yes, does the program cover Standards V and VI?

    Yes ☐ No ☐

17. What is the name of the program(s)

    ……..

18. Did you make any changes for Standards V and VI teachers during BridgeIT implementation?

    Yes ☐ No ☐

19. Is the community aware of the BridgeIT program at this school? Yes ☐ No ☐

20. Can you briefly describe the attitude of teachers and students toward BridgeIT program in your school?

    .....

21. Can you briefly describe the contribution of parents in improving the welfare of students at your school?

    .....

22. Does your school have enough books? A library?

    .....

23. What is the strategy in place to encourage school library use?

.....

24. Do your school have extracurricular activities?

.....

25. What are the social services available for students and teachers at school?

.....

26. What are the school's sources of income?

.....

Appendix II. Guiding Questions: BridgeIT Teachers

1. How long have you been teaching in BridgeIT program?

   1 year ☐ 2 years ☐ 3 years ☐ 4 years ☐

2. How would you rate your school performance before the BridgeIT implementation specifically to both the targeted classes (V & VI?) and targeted subjects (science and mathematics)?

   Excellent ☐ Very good ☐ Good ☐ Bad ☐ Very bad ☐

3. How do you rate your school performance during the BridgeIT implementation specifically to the program targeted classes (V & VI?) and targeted subjects (science and mathematics)?

   Excellent ☐ very good ☐ good ☐ bad ☐ very bad ☐

4. Regarding question 3, what factors contribute to this level of performance?

   i. ……

   ii. ……

   iii. ……

5. How would you rate your school's performance before the BridgeIT implementation, specifically regarding the targeted classes (V & VI?) and targeted subjects (science and mathematics) for boys and girls?

   i. Boys' performance Excellent ☐ Very good ☐ Good ☐ Bad ☐ Very bad ☐

   ii. Girls' performance Excellent ☐ Very good ☐ Good ☐ Bad ☐ Very bad ☐

6. How would you rate your school's performance during the BridgeIT implementation specifically to both the program targeted classes (V & VI?) and targeted subjects (science and mathematics) for boys and girls?

   i. Boys' performance Excellent ☐ Very good ☐ Good ☐ Bad ☐ Very bad ☐

   ii. Girls' performance Excellent ☐ Very good ☐ Good ☐ Bad ☐ Very bad ☐

7. What support do you receive from master trainers?

   i. ……

   ii. ……

   iii. ……

8. What support do you receive from the BridgeIT focal person?

   i. ……

ii. ……

iii. ……

9. Do you use other teaching materials in classes along with BridgeIT videos?

Yes ☐ No ☐

10. How different is a BridgeIT support sessions compared with other teaching sessions in this school?

i. ……

ii. ……

iii. ……

11. Which subjects are you teaching?

i. ……

ii. ……

iii. ……

12. What subjects are you interested in teaching?

i. ……

ii. ……

iii. ……

15. What are your teaching subjects of specialization?

i. ……

ii. ……

iii. ……

17. Are your fellow teachers affected by the BridgeIT teaching approach?

Yes ☐ No ☐

18. If the answer to question 17 is yes, explain how ……

19. Does the BridgeIT program come up in day-to-day discussions among teachers?

Yes ☐ No ☐

20. List the BridgeIT documents you find to be very useful in program implementation

i. ……

ii. ……

iii. ……

21. What is your experience on operation of BridgeIT program?

……

22. What are the challenges encountered in using BridgeIT approach in a class?.....

23. If you were to mention one of the interesting thing in the BridgeIT program what could be your response?

.....

24. Any comment on BridgeIT model and activities that you would like to share?

.....

Appendix III. Guiding Questions: Focus Group Discussion

1. Are you aware of the BridgeIT program to support teaching and learning?

   Yes ☐ No ☐

2. How often does your BridgeIT teacher use video in teaching?

   At every learning session ☐ rarely ☐ never ☐

3. List a few BridgeIT videos that you easily remember:

   i. ……

   ii. ……

   iii. ……

4. Which video are you more interested in?

   i. ……

   ii. ……

   iii. ……

5. How many subjects are you using this mode of learning?

   One ☐ Two ☐ Three ☐ Four ☐ Five ☐

6. How would you compare the subjects in which are you using this mode of learning with subjects that are not using this program?

   ……

7. Do you think this mode could be used in other subjects, too? Yes ☐ No ☐

8. If the answer to question 7 is yes, please explain why:

   ……

9. How helpful are your teachers in your learning, with BridgeIT?

   Very helpful ☐ Helpful ☐ Somewhat helpful ☐ Not helpful ☐

9. How helpful are your teachers in your learning, without BridgeIT?

   Very helpful ☐ Helpful ☐ Somewhat helpful ☐ Not helpful ☐

10. Do you get books and time to review your studies? Yes ☐ No ☐

11. Now that you have been engaged in a BridgeIT program, how do you see your academic performance? Very Good ☐ Good ☐ Poor ☐ Very Poor ☐

12. Are you happy with the way your classes are organized? Yes ☐ No ☐

13. If yes, explain. If no, how would you like your classes to be organized?

    ……

14. Is there anything you would like to say about BridgeIT or your learning experiences at your school with the BridgeIT program?

.....

Appendix IV. Observation Guide at School and District Offices

Observation Guide at School and District Offices

- Availability of BridgeIT documents and guideline, and adherence
- Incorporation of BridgeIT into the learning and teaching routine
- Operationalization of BridgeIT at the classroom level
- Teaching and learning in non-BridgeIT classes (within and between the grades)
- Attitude toward BridgeIT among teachers and pupils
- Approaches for lesson planning and preparation
- Assessment of classroom subject log book
- Performance rating at the school before and after BridgeIT, by gender
- Class participation of learners, by gender
- School examination results documents

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