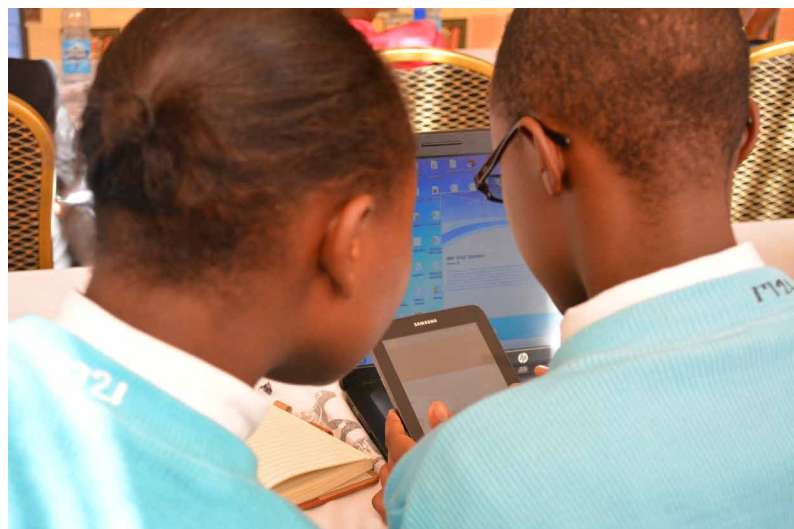


PARTNERSHIP TO STRENGTHEN INNOVATION AND PRACTICE IN SECONDARY EDUCATION (SIPSE)

Report on regional and national policy forums: Kenya and Tanzania: May 2015



SIPSE is designed and implemented by Global e-Schools and Communities Initiative (GESCI)

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1. INTRODUCTION

The Strengthening Innovation and Practice in Secondary Education (SIPSE) project has been running from July 2013 to May 2015 to pilot the innovative use of ICTs in the professional development of secondary school teachers. This has been done with the aim of improving their pedagogical skills and ability to integrate ICT into their teaching practice. This project was initiated with the goal of addressing the following challenges:

- The quality of teaching and learning in secondary schools in Science, Technology, English and Mathematics (STEM) subjects.
- The need to make education relevant to the needs of 21st century learners by preparing them for successful working lives.
- The in-service professional development of teachers in ICT Integration in STEM subjects. The face-to-face professional development model that takes a lot of staff time away from the classroom with the highest percentage of the professional development cost going to accommodation and participants' welfare rather than to the learning process.
- Offering the course in authentic teaching environments so as to unearth real challenges for evidence-based policy recommendations.

The teacher-training model employed a blended learning approach, which was targeted at addressing a key challenge of in-service teacher training: how to train teachers without removing them from the classroom. Participants were trained through 5 modules that provided a range of skills from use of ICT for didactic teaching to problem-based learning to project-based learning.

All of these activities as well as other related matters brought to the fore a range of lessons learned, challenges and opportunities to be discussed in the regional and national policy forums that were convened in May 2015.

1.1 Objectives of the national and regional policy forums

The objective of the regional and national policy forums was to develop policy recommendations on competencies and requirements for teachers to be included in national teacher training policies in the project countries and to feed into ICT-based professional development courses for teachers in general.

These were drawn from the monitoring and evaluation research of the emerging models, lessons learned, and challenges and opportunities for teaching and learning in the SIPSE project schools.

1.2 Participants

The policy forums' participants were drawn from participating schools (Heads of Schools, team leaders, teachers, and students), Regional Education Managers (DEOs, REOs, County Education Officers and County TSC Directors), Universities offering pre-services training to the teachers, in-service teacher training institutions, and the Ministry of Education headquarters. Education stakeholders from the curriculum development institutions and in-service organizations and departments were also invited.

1.3 The expected deliverables from this project included:

Policy forum report with the following details:

- Lessons learnt, challenges and opportunities
- Policy recommendations for ICT use in teacher professional development in Kenya and Tanzania
- Dissemination of outcomes from the forum through various channels of communication and targeted at different audiences (partners, funders, ministries of education, schools, teachers, students)

See [appendix 1](#) for an overview of the policy forum programme and [appendix 2](#) for a listing of participants.

1.4 Policy forum facilitation, format and programme

The policy forums were facilitated at national level in Kenya and Tanzania were facilitated by Esther Mwiyeria, Patti Swarts (GESCI Programmes Director) and Mary Hooker (GESCI Senior Education Specialist) and Grace Omondi (GESCI Communications Specialist) with the assistance of Master Trainer teams. The forums were facilitated at regional level in Kenya and Tanzania at regional level in each country by Esther Mwiyeria (SIPSE Project Manager) and Grace Omondi (GESCI Communications Specialist) with the assistance of SIPSE Kenya and Tanzania Master Trainer teams. The facilitation format was to use a participatory consultative approach that integrated interactive sessions of presentations, panel discussions, group work simulations and plenary sessions.

Mr. Jerome Morrissey, the CEO GESCI, made opening remarks and the Ministry of Education representatives in Kenya (Mr. Stephen Mbogua) and Tanzania (Mr. Joseph Ngoseki) made the welcome remarks. The first session was facilitated by the GESCI Communications Specialist, Grace Omondi, and who presented an overview of the SIPSE 2013-2015 project that included a video presentation entitled "SIPSE Professional Development for the Integration of ICT in STEM Teaching and Learning: 2013 – 2015".

The second session focused on a presentation of the SIPSE 2013-2015 Monitoring, Evaluation and Learning research that was summarized in the policy brief - presented by the GESCI MEL research team of Mary Hooker and Esther Mwiyeria. The MEL research produced a number of key findings within the policy forum thematic areas of *Leadership and Planning for ICT Use in School Settings, ICT in the Curriculum, Teacher Professional Development for ICT and Infrastructure and Resources*.

One of the key findings identified in the research was the need for a triangular approach of **leadership, teacher and whole school development** as key for effective ICT integration in secondary level schooling. The research presented several possible policy responses to support such a model.

See [appendix 6](#) for Policy Forum Brief document and presentation.

1.5 Group break-out sessions

The group break-out sessions and plenary sessions were facilitated by the GESCI facilitator team and Master Trainers. They provided the participants with opportunities to examine the SIPSE MEL research results in each of the thematic areas, to learn from each other's experiences at school, regional and national levels throughout the SIPSE project implementation, to identify possible policy responses and to consolidate policy responses, ideas and priorities for the way forward in the panel lead session that followed the group break-outs.

There were parallel sessions looking at student webquest projects nominated by schools for presentation by students at the regional and national workshops. The projects were assessed by participants for overall best project awards at regional and national levels. The projects provided concrete examples and experiences of the project focus on higher order 21st skills and knowledge development and learning that is student directed, interactive and collaborative and that lies at the heart of the SIPSE focus on innovative practice.

The final session in all forums presented awards ceremonies for best performing schools and teachers in the SIPSE programme. The awards were presented by GESCI and national partners affiliated to ICT in education and teacher development.

See [appendix 3](#) for an overview of the discussions, policy ideas and policy recommendations that came out of the break out group sessions.

2. OVERARCHING THEMES, DISCUSSIONS AND POLICY RECOMMENDATIONS

Over the course of the break-out sessions, key ideas and policy responses on *leadership and vision, ICT in the curriculum, teacher professional development and infrastructure and resources* were discussed and prioritized by participants. There were a number of common themes that emerged for the strengthening and upscaling of the SIPSE model for teacher professional development and ICT as well as general policy recommendations for improving ICT use in teacher professional development and ICT integration in secondary schooling.

The following section presents the key takeaways that emerged from the break out group and plenary discussions of the regional and national workshops in Kenya and Tanzania.

2. 1 LEADERSHIP AND PLANNING

In Kenya... the discussions from three groups in the leadership and planning held at regional and national forums were centered on the following themes:

There is a need for specific budget allocation at ministry and school level of ICT development. There was a general feeling from the participants that there was no sufficient allocation of funds and commitment to the development of ICT. When and where this was available, it was felt that the leadership always opted to use these funds whenever there was a shortfall in any other expenditure area. This led to one-off activities in the ICT development process which was counterproductive in an area that is so dynamic like ICT. This was seen to be as a result of a lack of enough appreciation of the benefits that ICT can bring into the teaching and learning process in the core curriculum subjects. To this end the proposal was that the Leadership and Boards of Management (BOMs) in the schools should be sensitized and trained on the importance of ICT in administration, communication, and curriculum content delivery. Further, the participants felt that ICT should not be a preserve for a few students who take computer studies but it should seamlessly be used to deliver curriculum content in all the subjects. This would require sufficient and effective ICT resources to increase access and reduce on time wasted in accessing online digital content and resources due to narrow bandwidth and outdated equipment without sufficient memory.

Leadership support, according the suggestions put forward could be provided through championship by the school/county leadership, an increase in lesson duration for specific ICT Integration periods, participation by school managers in monitoring and reflective session with teachers and a clear continuous follow-up on the implementation of the ICT vision for each school.

Since ICT resources are expensive, it was suggested that partnerships between the school community, the private sector and the leadership should be explored so as to mobilize the much needed resources.

In Tanzania... the teams that discussed the leadership and planning issues in Tanzania felt that ICT should be a core subject in the curriculum for all secondary school students like other subjects. For this to be implemented successfully, a roadmap for ICT Integration at all levels of education was needed. This roadmap should include guidelines for accessing the ICT resources at school level and proper use of the internet for students and teachers. Parents, teaching and non-teaching staff and the wider community should be sensitized on the benefits and limitations for ICT use in teaching and learning. A conducive environment for ICT use should be created through the development of the ICT infrastructures, training of teachers, and leadership training on appropriate mechanism for monitoring and reporting integration of ICT in teaching and learning. To bring out the aspirations in the uptake of ICT as a core subject, one participant clarified by saying:

"...Just like English is used in communication in all subjects while still being taught as a separate subject, ICT should also be integrated in all subjects and can still be taught as a subject on its own..."

2.2 TEACHER PROFESSIONAL DEVELOPMENT

Key policy themes and ideas emerging in the Teacher Professional Development policy domain break out group discussions in Kenya and Tanzania are presented in the table below. The policy ideas have been grouped around **seven main themes** related to:

1. pre and in-service ICT use in teacher education
2. teacher awareness, communities of practice, peer to peer & school learning networks
3. planning continuous professional development
4. teacher confidence & self-efficacy, blended learning, digital tools & e-content support
5. focus of teacher professional development
6. informal professional learning networks
7. accreditation, performance, recognition & remuneration, institutionalization & sustainability

Themes	Policy Ideas
1. Pre-service and in-service ICT use in Teacher Education	<ul style="list-style-type: none"> • The government should set an adequate budget on ICT based training for both in-service and pre-service teachers • ICT training should be made compulsory at all levels of teacher training (diploma, bachelor) • There should be training (pre-service/in-service) of all teachers with ICT skills <p>On pre-service:</p> <ul style="list-style-type: none"> • ICT should be an integral part in all teacher training colleges <p>On in-service:</p> <ul style="list-style-type: none"> • After pre-service training teachers should be provided with continuous support and opportunities for knowledge deepening, workshops, refresher courses, short courses • Training in ICT should be compulsory from class 1
2. Teacher awareness & participation, communities of practice, peer-to-peer & school learning networks	<p>Teacher awareness & participation</p> <ul style="list-style-type: none"> • Teachers need to be open-minded to use new technologies in integration of ICT • There should be annual seminars for teachers on ICT integration in the teaching and learning process <p>Communities of practice</p> <ul style="list-style-type: none"> • The capacity of in-service teachers should be built, and they should be kept updated with emerging technologies <p>Peer-to-peer & school learning networks</p> <ul style="list-style-type: none"> • There should be exchange programmes for teachers with partners who have fully implemented technology in their practices • Teachers should be encouraged to collaborate with each other
3. Planning continuous professional development	<ul style="list-style-type: none"> • ICT should be made a mandatory course for practising teachers. • Schools should be funded to involve teachers in use of ICT and undergo training on the use of ICT equipment. • Every teacher should continuously undertake a professional teacher development course in the use of ICT • Teachers should be given a phased in-service course in ICT integration • Teachers should be sensitised about the need to integrate ICT in the teaching and learning process • There should be higher frequency of in-service training - to build capacity of teachers and keep them updated with technology after every two years

Themes	Policy Ideas
4. Teacher professional development focus	<ul style="list-style-type: none"> ICT training should be made compulsory and ICT integration a priority at all levels and subjects of education (administration, teachers, school managers) <p>In pre-service</p> <ul style="list-style-type: none"> Teachers should only specialize in three subjects – and one of these should be ICT <p>In in-service</p> <ul style="list-style-type: none"> Teachers should be well-trained in ICT integration so as to explore the challenges in ICT integration in classroom practices A clear and practical approach on ICT integration during teacher training programmes should be incorporated
5. Teacher confidence & self-efficacy, blended learning, digital tools & e-content support	<p>Teacher confidence & self-efficacy</p> <ul style="list-style-type: none"> One of the requirements for teacher recruitment should be ICT compliance in order to enhance the teaching and learning process Teachers should continuously take short courses to build ICT confidence <p>Blended learning, digital tools & e-content support</p> <ul style="list-style-type: none"> Online training should be encouraged Each teacher should be equipped with a laptop Teacher portals so that teachers can take advantage of digital content for teaching and learning
6. Informal learning	<ul style="list-style-type: none"> Teachers should be encouraged to constantly seek more knowledge on use of ICT tools Teachers should be encouraged to develop their materials and share them for peer review and improvement.
7. Accreditation, performance, promotion, recognition & remuneration, institutionalization and sustainability	<p>On accreditation:</p> <ul style="list-style-type: none"> In Tanzania: Certificate level training for teachers is no longer done In Kenya: The Teachers Service Commission (TSC) should recognise the SIPSE course as a teacher development course and award accordingly. TPD should be followed by a thorough evaluation during training to ensure that teachers are well skilled <p>On performance, recognition & remuneration</p> <ul style="list-style-type: none"> A performance-based reward scheme should be considered for teachers successfully integrating ICT in their lessons This could include promotion, commendations, recognition. Teachers that are ICT compliant should have relatively better remuneration <p>On institutionalization:</p> <ul style="list-style-type: none"> In Kenya: Each sub-county should establish an ICT centre for collaboration and sharing of ICT ideas and resources by teachers and students. <p>On sustainability:</p> <ul style="list-style-type: none"> Will GESCI follow up the SIPSE course with knowledge creation certification level for this that are one certified? What is the future of SIPSE alumni?

2.3 CURRICULUM AND ASSESSMENT

Key policy themes and ideas emerging in the Curriculum and Assessment policy domain break out group discussions in Kenya and Tanzania are presented in the table below. The policy ideas have been grouped around **five main themes** related to:

1. digital content & access
2. digital content & student experience
3. digital content & teacher experience
4. planning ICT integration across the curriculum
5. digital content and ICT infrastructure

Themes	Policy Ideas
1. Digital content & access	<ul style="list-style-type: none"> ICT integration should be captured at all levels of education Digital/e-content should be developed for all subjects Content delivery should be accessed through ICT tools Content should be posted and shared by teachers in online portal
2. Digital content & student experience	<ul style="list-style-type: none"> Materials should be designed in a way that they can help the student interact with ICT Computer studies should be made a core subject for students to enhance ICT integration All students must be taught using ICT integration All student exercises and presentations should involve ICT tools
3. Digital content & teacher experience	<ul style="list-style-type: none"> All teachers should be trained to be competent in the use of ICT resources and encouraged to use ICT in teaching and learning Student teachers in training colleges should be trained on the uses and application of ICT. Training in teacher colleges should include integration of ICT, and in-service teachers should get refresher courses on ICT skills Teachers should be engaged in content research using ICT in their subject areas Teachers should learn to evaluate content accessed through online channels Teachers should be involved in writing/developing the syllabus for all subjects.
4. Planning for ICT integration across the curriculum	<ul style="list-style-type: none"> <i>In Tanzania:</i> ICT is already in the national curriculum at primary (TEHAMA) and secondary (ICS) levels <i>In Kenya:</i> Is it the role of KICD to provide content for all schools? KICD to spearhead and take the lead and then other stakeholders should support the process ICT should be part of the curriculum of taught subjects and not a 'specialized course' The national curriculum designers should plan seminars about ICT integration The curriculum should be regularly revised to ensure that it is up-to-date and relevant The syllabus and curriculum should be reviewed to adequately accommodate ICT integration. The curriculum should be reviewed to reduce or merge subjects to create time for addressing 21st century skills development Review the syllabus to ensure that the learners are skilled to handle the challenges of the 21st century There should be workshops for teachers every 5 years to evaluate if the syllabus is still relevant, and if there are any areas to be updated.

Themes	Policy Ideas
	<ul style="list-style-type: none"> Teachers should be involved in developing the ICT integration curriculum Review and adjust timetabling to allow for integration of ICT in all subjects This takes longer than the currently allocated 40 minutes - lessons could be blocked so that lessons that require ICT integration get a double lesson. Extra time for more student activities out of the normal time-table should be created
5. Digital content & ICT Infrastructure	<ul style="list-style-type: none"> The ministry of education should support the implementation of ICT integration and enable teachers to acquire the necessary equipment There needs to be broader thinking to understand that ICT integration could very well be beyond just computers, to the use of other media like radio, TV, mobile phones.

2. 4 INFRASTRUCTURE AND RESOURCES

In Kenya... discussions around ICT infrastructure and resources pointed at the need to have ICT being made available for teachers and students through increased budgetary allocation at school level. To make this happen, cost sharing between the schools, the community, and private sector should be explored. ICT in school should not only be for the acquisition of ICT skills for students but also for seamless use in the delivery of content in all the other curriculum subjects. This would call for ICT equipment that is targeted at this function of ICT use in teaching and learning. ICT provision should go beyond the provision of desktops in a computer lab to laptops and tablets for teachers, internet connectivity and projectors. They further noted that standards for acquisition, distribution, modes of access and appropriate use of ICT in the schools should be developed.

In Tanzania... the participants felt that budgetary allocation for ICT and the acquisition of the resources was urgently required. In the absence of government support due to competing priorities, modalities for policies on private-public partnership should be developed to guide schools on how to leverage support for affordable ICT infrastructure. Cost sharing measures with the school and parents' community should also be explored and supported by the government and as one teacher noted:

".....in the same way the government supports the requirement for all parents to provide school uniform and books for students, it should also make it a compulsory requirement for all students to contribute towards the acquisition and maintenance of ICT infrastructure and resources at school level."

The provision of ICT infrastructure, they added should also be coupled with standards for ICT Integration in teaching and learning in schools which should be developed and circulated by the ministry to all levels of education. This, they argued would provide clear lines of skills progression from one level of education to the next. For the efficient use of the ICT resources, maintenance and training should be regular and mainstreamed into the education budget.

2. 5 STUDENT PERSPECTIVES ON ICT IN TEACHING AND LEARNING

The student representative group from voted for more and reliable internet connectivity in schools. Where this is available, the observed that it was not made accessible to the students. To deter students from accessing unsuitable sites, they proposed the use of firewalls and guidelines that are mainstreamed into the regular procedures and code of conduct for students. Free and easy access to the computer room could also make learning easier and fun. They advocated for digital books and evaluation through online access.

They noted that the infrastructure in the schools should also be improved in terms of quantity and quality. ICT skills should be offered to all the students in the school as a core subject and not just to the few who take computer studies according to the students. This should include frequent use of ICT in communication and presentation so that they can cultivate the skills necessary for the 21st Century.

In summary, they made the following policy recommendations:

- The government should consider the use of laptops in schools in order to improve ICT skills.
- There should be reliable internet connectivity in schools throughout.
- Resources such as laptops, computers, printers, ICT rooms should be made available and the quantity increased.
- All teachers and students should be educated on the use of computers in teaching and learning.
- There should be maintenance and updating of computer software and hardware for the smooth running of teaching and learning.
- Resources (computers, projectors and access to internet) should be availed to the various learning institutions.
- E-learning should be incorporated into the system by setting online tests and assignments.
- Text books should be converted to electronic formats

2.6 POLICY RECOMMENDATIONS

The policy recommendations were collected, compiled and consolidated based on a synthesis of the policy forum ideas and recommendations emanating from the 5 policy forum events in Kenya and Tanzania. The recommendations are presented below organized under the **four main themes** of the policy forums, namely:

1. leadership and planning,
2. teacher professional development,
3. curriculum and content and
4. infrastructure and resources

The recommendations are organized in a matrix of the policy domains and specific recommendations pertaining to Tanzania and Kenya under each domain.

Leadership & Planning	
TANZANIA	KENYA
<ul style="list-style-type: none"> • The school leadership should create different projects and strategies to improve the use of ICTs • The school leadership should educate on the proper use of technology to avoid negative impact on the students • Schools should have an action plan to implement the use and application of ICT as a tool for teaching and learning. • There should be a clear focus on building ICT competencies, which encourages the learners to be self-sufficient in life • Just like English is used in communication for all subjects while still being a separate subject, ICT should also be integrated in all subjects and can still be a subject on its own 	<ul style="list-style-type: none"> • Clear objectives and an implementation plan (strategy that highlights these) of ICT integration in teaching and learning process with a clear plan for capacity-building for teachers and support staff on ICT use should be developed by the management • A roadmap for the provision of sufficient and efficient infrastructure for ICT integration • 20% of school tuition budget should go to ICT integration • Each department should come up with an ICT project-based task to be completed within a given period of time • There needs to be continuous and relevant training on ICT for all teachers and administrators • Head-teachers at county and national level should be sensitized on importance of ICT integration in teaching and learning. • Teacher training institutions should incorporate and review the ICT integration course in the curriculum for pre-service preparation of teachers • A plan should be developed for human resource training on emerging ICT trends jointly with Industry • An ICT integration plan should be incorporated in the school strategic plan but should be positioned in such a way that it can withstand competing priorities in the event of a shortfall of funds in other activities • Resources should be mobilized for ICT infrastructure.

Teacher Professional Development	
<p>TPD – PRE-SERVICE & INSERVICE</p> <ul style="list-style-type: none"> • Pre-service: Student teachers should be trained on how to integrate ICT in teaching their subjects. This will develop their confidence • ICT integration should be seen as a priority subject in teacher pre-service training so that every graduate coming out of teacher training colleges is skilled. If ICT training is made a part of the pre-service training curriculum, there would be no need for 'extra' activities to skill teachers afresh, and instead the focus would be on refresher courses during in-service training. • In-service: To build teachers' capacity and keep them regularly updated with ICT. <p>INSTITUTIONALIZATION & CERTIFICATION</p> <ul style="list-style-type: none"> • Because in-service training will be ad-hoc dependent on school and ministry budget fluctuations, it needs to be regularized and institutionalized so that it is done at regular intervals. 	<p>ICT TEACHER COMPETENCIES FOR 21ST CENTURY</p> <ul style="list-style-type: none"> • The terms of service for a 21st century teacher needs to be reviewed – what has changed for teaching profession in this century? • The 21st century teachers has increased demands and therefore the remuneration needs to match • Teachers need to be open-minded to use new technologies in integration of ICT. • There needs to be motivation for both training and implementation of ICT in education. <p>PRE-SERVICE AND IN-SERVICE</p> <ul style="list-style-type: none"> • Teacher professional development approaches should be sustained at all levels of education, and this should be integrated at in-service and pre-service levels. • There should be training (pre-service/in-service) of all teachers with ICT skills. • The training should be comprehensive training on ICT integration (why are teachers in training still using analogue lesson plans?) <p>INSTITUTIONALIZATION & CERTIFICATION</p> <ul style="list-style-type: none"> • The government should ensure that teacher professional development entails a blended approach to capacity building. • Each sub-county should establish an ICT centre for collaboration and sharing of ICT ideas and resources by teachers and students • Increase funding to ICT training at school level/in-service and personnel remuneration • Research, monitoring and evaluation of the skills and competencies attained is key to success of the programme.
Curriculum and Content	
<p>DIGITAL CONTENT IN THE CURRICULUM</p> <ul style="list-style-type: none"> • Materials and resources should be designed in the way that they can integrate ICT in all subjects. • Curriculum developers should redesign and insert into the syllabus ICTs into teaching and learning • There should be a comprehensive review of the existing ICT curriculum so that ICT is not viewed as a separate entity. This review of the curriculum should cater for ICT integration in all subjects, and have ICT be seen as a separate and integrated entity 	<p>DIGITAL CONTENT & TEACHER EXPERIENCE</p> <ul style="list-style-type: none"> • There should be a nationally acceptable secondary education curriculum for pre-service and in-service ICT integration training (ICT). • There should be continuous professional capacity building for all teachers. • There needs to be motivation for both training and implementation of ICT in education. <p>DIGITAL CONTENT & LEARNER EXPERIENCE</p> <ul style="list-style-type: none"> • Strengthen implementation of ICT integration at all levels of learning. • Develop digital content in all levels of education (universal content across all levels – role of KICD; teacher designed digital materials role of teacher communities and networks)

<p>DIGITAL CONTENT IN CLASSROOM PRACTICE</p> <ul style="list-style-type: none"> • The time for all lessons should be increased from 40 minutes to 60 minutes in order to encourage integration of ICT and project-based learning • It is the curriculum that dictates the timetable. If the timetable is to be changed, the curriculum must be reviewed so that ICT is not taken as an optional subject. If it is made compulsory it will also be examinable 	<p>DIGITAL CONTENT & THE CURRICULUM</p> <ul style="list-style-type: none"> • The curriculum should be reviewed to make it relevant and to incorporate ICT integration - to reduce or merge subjects to create time for addressing 21st century skills development. • The content should be regularly reviewed to eliminate obsolete information/irrelevant content. • Review the syllabus to ensure that the learners are skilled to handle the challenges of the 21st century. • Computer studies should be made a core subject for students to enhance ICT integration. <p>DIGITAL CONTENT, CLASSROOM PRACTICE, MONITORING, EVALUATION, RESEARCH AND LEARNING</p> <ul style="list-style-type: none"> • The timetable should be reviewed to allow ICT integration in terms of time allocation. • Monitoring and evaluation should be carried out in integration of ICT. • There should be research and a platform for sharing ideas
<p>Infrastructure and Resources</p>	
<ul style="list-style-type: none"> • The government has to make sure that every school has electricity and internet connectivity. • There should be an ICT resource center in each school. • Every school should have a well-equipped ICT room • Resources/funds for procurement of ICT equipment should be regular and mainstreamed into the budget of the ministry of education and vocational training • Each Tanzanian school should have reliable electricity, complete with options to switch to alternative sources of power when there is a blackout. • Each Teachers' College should be facilitated with basic ICT equipment in order to produce teachers who are equipped with 21st century basic skills 	<ul style="list-style-type: none"> • ICT tools and resources should be provided to students, teachers, support staff at school level – and these should be in a common pool, e.g. in the staffroom, instead of the principal's office. • There should be training of teachers, students and support staff on proper use of ICT resources. • The directive on the use of mobile phones and ipads in schools should be reviewed; especially during exams periods for teachers • Schools should invest in appropriate ICT equipment (that includes the government determining a ratio of ICT equipment/resources to students) e.g. solar powered bus with ICT computers that go from village school to village school. • Strategies for pooling and sharing of ICT resources/ideas to boost connectivity should be developed. e.g. purchasing masts, programmes, software, etc. • Students' contribution: Make internet connectivity resources available for every student • Students' contribution: The administration should add more equipment for ICT learning. • All stakeholders to provide funds for adequate and efficient ICT resources at all levels of education. There needs to be mobilization of resources. • The government should avail electricity to all schools, and then the school management should ensure backups and power outlets in all teaching and learning rooms. • School management should ensure internet connectivity to all departments and classrooms; and can bring on board corporate well-wishers (eg. Safaricom) for support. • Schools should prioritize the construction of ICT rooms

3. WRAP UP AND WAY FORWARD

3.1 Participant Exit Evaluation

At the end of each workshop in the two countries, participant's reaction to the content and facilitation processes was measured through a questionnaire. On being asked how the policy recommendations workshop was carried out, 93% of the participants felt that the approach was very thorough as shown in figure 1.

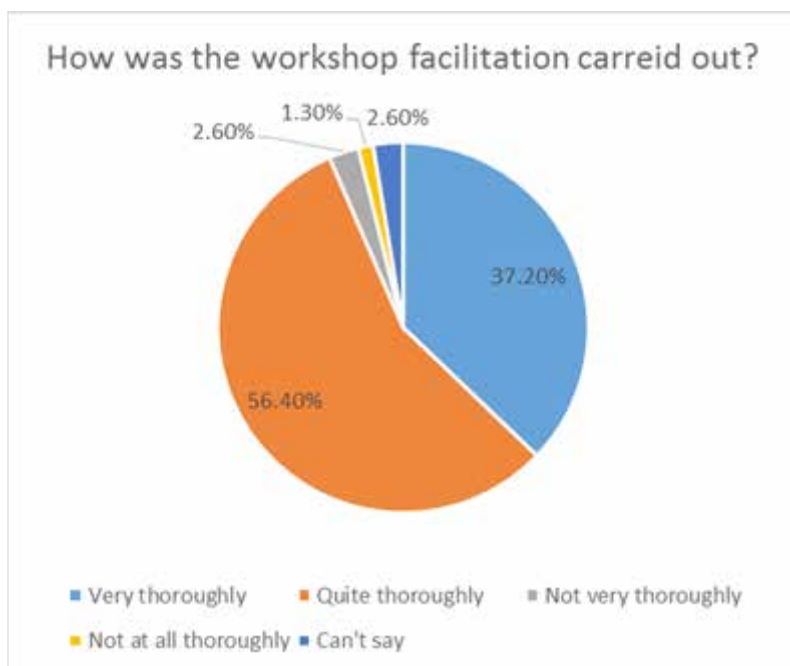


Figure 1: Quality of workshop facilitation process

On relevance of the policy ideas and recommendations to the schools represented, 85% of the participants indicated that they were very relevant as presented in Figure 2.

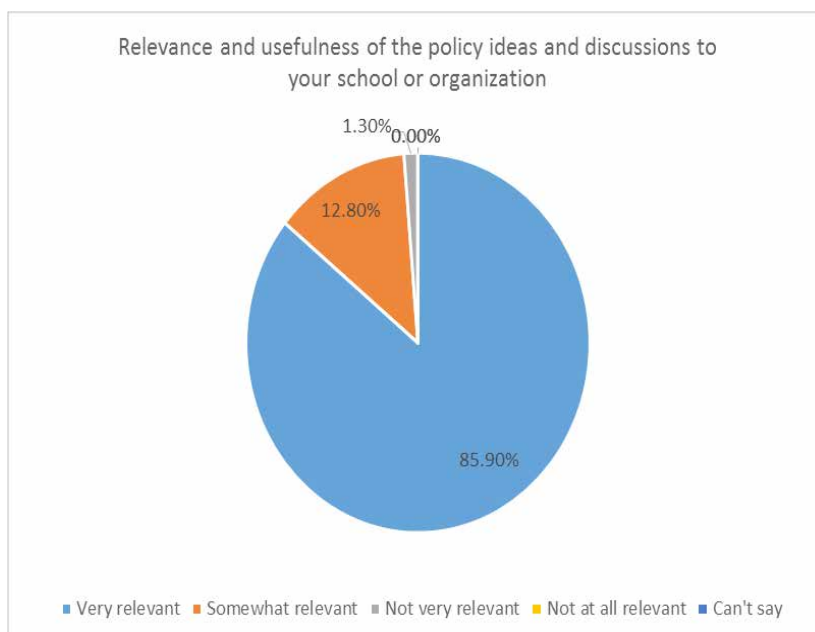


Figure 2: Relevance and usefulness of policy ideas and recommendations

The participants were also asked to make recommendations on measures that would ensure effective integration of ICT integration in Secondary schools as presented in Figure 3.

The participants felt that school-based professional development for ICT use, availability of internet access and budgetary allocation for ICT resources in the context of whole-school planning for ICT integration would contribute most to the success of any ICT integration measures at school level.

Recognition and motivation for both teachers and students was also seen as an important component to promote the seamless use of ICT in curriculum content delivery. Connecting schools was given the least priority most probably because they must have felt that “they should have put their house in order first before reaching out to others”.

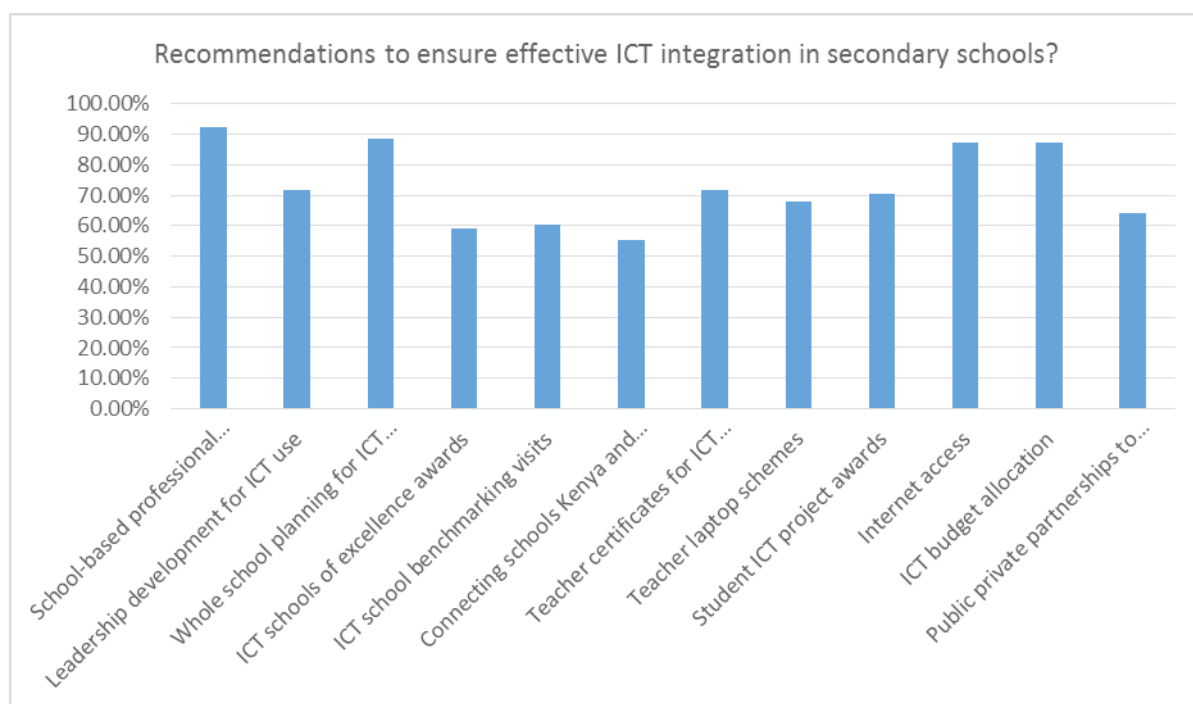


Figure 3: Recommendations for effective ICT use in Schools

See [appendix 4A](#) for a more detailed account of the exit survey summary

4. PARTICIPANT IMPACT STORIES

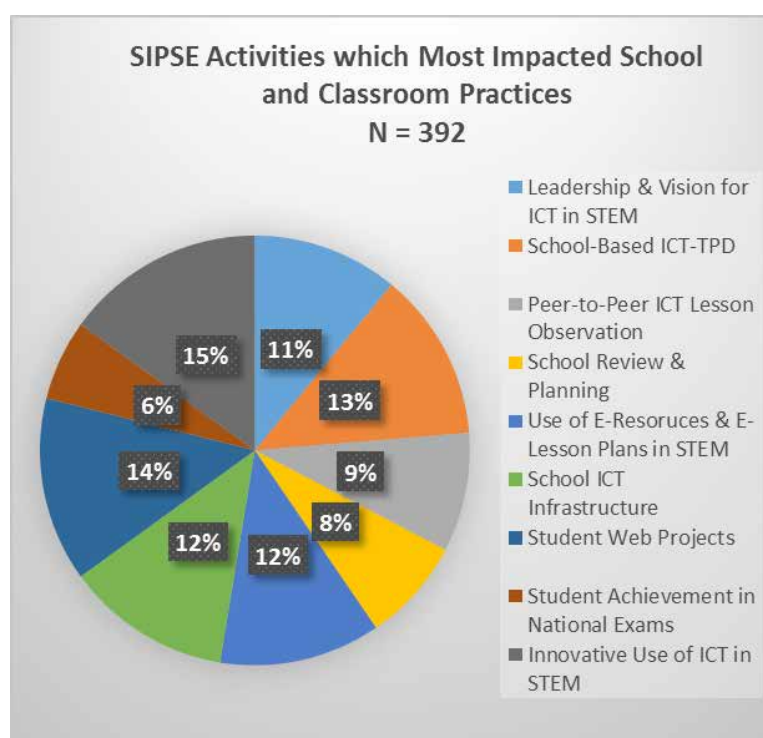


Figure 4: Most impactful SIPSE activities

An impact story survey was completed by participants during the policy forums in Kenya and Tanzania. The survey set out to assess the most significant impact that the SIPSE project contributed to in relation to ICT use by teachers and schools to support STEM teaching and learning. Participants provided impact stories in terms of 'what' was the most significant aspect of the project impact, 'who' was impacted and 'how' did SIPSE contribute to the impact.

On a question about what SIPSE activity areas had the most significant impact on ICT use in the schools and classroom practices, it was possible to identify 6 key areas from the % distribution pattern of the 392 participant responses, namely: *leadership & vision for ICT in STEM* (11%), *school ICT infrastructure* (12%), *e-resources and e-lesson plans in STEM* (12%), *school based ICT teacher professional development* (13%), *student webquest projects* (14%) and *experimenting with innovative use of ICT in STEM teaching and learning* (15%) (Figure 4).

The participant impact stories mirrored the patterns of their ratings of the SIPSE most significant activity areas that affected individual student, teacher and school practices - as per the examples below.

A student impact story perspective: "SIPSE has enabled me as a student to learn new different things which at first I was not aware of them, also helped to learn new skills of interaction between people whereby I have understood the importance of cooperation to me as a student."

A teacher impact story perspective: "It has revolutionized learning by captivating the learners' attention and participation; made teaching and learning friendly; helped us overcome the challenges of teaching abstract concepts."

A head teacher impact story perspective: "This was an eye-opener to the teaching profession."

The teachers' ICT knowledge and skills were sharpened

Learner: Enthusiastic learning, also became experts in searching for information.

Whole school: The entire school has positively taken in ICT; and attempted integrating it in teaching and learning."

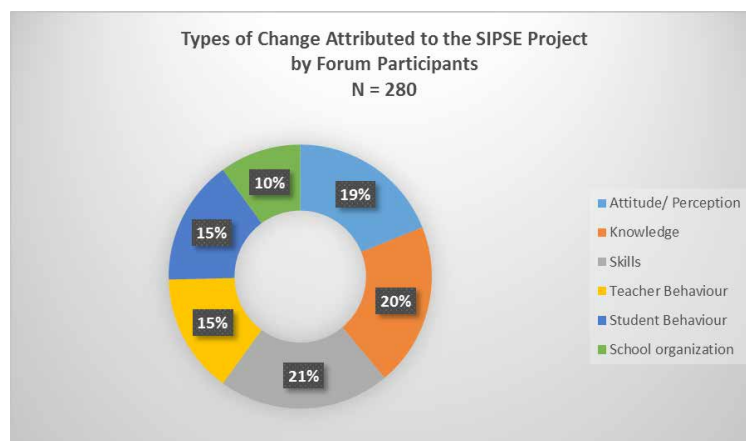


Figure 5: Types of significant change attributed to SIPSE

Participant response patterns attributed the most significant changes brought about by the SIPSE project as linked to the categories of *attitude* (19%), *knowledge* (20%) and *skills* (21%) – with changes in *teacher behavior* (15%) and *student behavior* (15%) coming in as slightly less significant and *school organization* (10%) as the least significant change domain (Figure 5).

Many participant final comments in the survey reflected the most significant change types attributed to SIPSE – see below.

“...Demystifying the use of ICT materials in teaching and learning. Changing the perception by teachers on the use of ICT-integrated lesson plans”... “The use of ICT in the classroom was monumental since prior to this, the computer lab was thought to be for the ICT teachers and their students”... “Online training, chats and forums. Face-to-face workshops”... “It brings awareness and understanding to both teachers and students on the use of ICT equipment...”

See [appendix 4B](#) for a more detailed account of the impact story survey

5. NEXT STEPS

This report will be disseminated to various audiences and stakeholder groups in different formats and through various channels of communication. All the SIPSE alumni teachers will receive a copy of the report via email. The ministries of education in Kenya and Tanzania will receive summaries of the key policy recommendations in soft and hard copies. In addition, the report will be made available on the GESCI website with a brief write-up and follow-up posts on social media. A brief of the recommendations coming from this project will also form part of the regular GESCI communications and publicity package for future events and projects. Finally, the policy recommendations will be shared in any upcoming scaled-up phase of the project as a basis for implementation of future projects and course correction in the two countries.

6. LIST OF APPENDICES

- Appendix 1: Programmes for the Regional and National Forums
- Appendix 2: List of Participants in Regional and National Forums
- Appendix 3: Overview of Break Out Group Discussion Mappings - Regional and National Forums
- Appendix 4: Surveys
 - 4A: Exit survey summary
 - 4B: Impact story survey
- Appendix 5: Facebook and Twitter Posts
- Appendix 6: Policy Forum Brief
- Appendix 7: SIPSE Project video