

Survey of the African Knowledge Exchange Network

**GeSCI's Research and Facilitation Framework for ICT in
Education and Development**

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Informing GeSCI's Research and Facilitation Framework for ICT in Education and Development

Background

The Global e-Schools and Communities Initiatives (GeSCI) has been surveying the opinion of partners to help develop its new Research and Facilitation Framework for ICT in Education and Development. **The purpose** of GeSCI's Research & Facilitation Framework is to assist partners to develop an understanding of the major challenges of ICT integration in their education systems. The new framework embeds a concept of interfacing research, policy and practice in order to maximize the potential of ICT for transformational impact in education systems.

Consultation on research issues to enhance the development of the framework has taken place in various ways including:

- Internal discussions with GeSCI's national, regional and global teams
- Workshop discussions and brainstorming with GeSCI's research partners, communities and networks
- Commissioned meta-review research to map what is known and not known in the field of ICT in Education and to identify the gaps for further research and development
- A questionnaire to get a wide range of views from policy-makers, officials, practitioners and researchers in GeSCI's regional networks – Africa, Asia and Latin America

This report presents the findings drawn from the questionnaire survey of partner stakeholders who participated in GeSCI's third African Knowledge Exchange (AKE) Regional Workshop which took place in Accra, Ghana from 8 – 10 July 2009. The theme of the workshop was *21st Century Skills: How can the use and integration of ICTs in the Curriculum and Assessment Contribute to Building a Knowledge Society for All?*.

The questionnaire contained 10 questions soliciting a mix of closed and open responses. It was distributed to 30 participants during the workshop process. There were 20 responses completed and returned by the end of the workshop. Respondents represented the 14 different countries participating in the workshop - Kenya, Tanzania, Lesotho, Botswana, Cameroon, Burkina Faso, Rwanda, Botswana, Mozambique, Mali, Zambia, Senegal, Burkina Faso, and Botswana. Of the respondents who completed the survey, 95% (19) reported details on their names, organizations and work profiles. From this information it was possible to derive that 65% (13) of respondents were men and 30% (6) were women; with regard to educational context 25% (5) of respondents worked for Curriculum Research and Development Institutions, 25% (5) for Examinations Boards or Councils, 20% (4) for Ministries of Education or Higher Education Institutes in general,

5% (1) for General Education, 5% (1) for Basic Education, 5% (1) for Female Education, 5% (1) Planning and 5% (1) for the Inspectorate; with regard to work profiles 30% (6) of respondents were Directors, 30% (6) Deputy Directors, 15% (3) Teacher Trainers, 10% (2) Heads of Departments or Units and 10% (2) described their positions as Curriculum Specialist and Examinations Secretary respectively. The majority of respondents to the survey were thus male, working either in Curriculum Research and Development or Examinations at a senior managerial level.

The respondents provided a wide variety of information about ICT issues and research needs related to their work practices, and it proved difficult to draw overarching generalisations on research requirements to inform GeSCI's research and facilitation agenda. Nevertheless, three main conclusions can be drawn from the survey findings:

- the greatest need for information is in the use of ICT in Teaching and Learning and the scaffolding elements of curriculum, assessment and e-content
- there is a high level of understanding and awareness amongst respondents of the complexity of ICT integration in traditional educational systems and the restructuring in teaching and learning that technology infusion should promote
- the broad range of research issues identified by respondents would represent a research continuum for examining ICT use for system improvement to examining its use for system transformation

The need for an expansive research agenda for understanding the impact of the ICT phenomenon in education emerged clearly from the survey findings. The following observation from one respondent summarizes much of the reflection on research requirements amongst stakeholders to address the challenges of new technology integration in their education systems:

ICT integration is bypassing developments in our Education system. Stakeholders are actually waiting for Education to respond to the needs of 21st Century Skills in ICT. Public understanding of ICT and understanding of skills required by the General Public for survival is an important research area.

Type of Information on ICT required

When asked about the type of ICT in Education information needed for their work areas, respondents listed the following:

- ICT integration in Teaching and Learning 40% ¹(8)
- ICT Curriculum with regard to the elements of: design and development/ south-south capacity building/ reform in teacher education/ integration in teaching and learning 35% (7)
- Assessment for learning 20% (4)
- E-Content design, development and evaluation 15% (3)

¹ Percentages indicate the % of respondents who said that their need for information was required in this area of ICT -Education

- Leadership and management information systems 15% (3)
- Research on ICT impact on student performance / ICT pilots in schools 10% (2)
- ICT teacher competencies and teacher education 10% (2)
- ICT policy formulation 5% (1)

This would clarify that amongst the respondents the greatest need for information is in the use of ICT in Teaching and Learning with information on the scaffolding elements of curriculum, assessment and e-content high in respondents' priorities for information needs.

Significant research questions arising from work practices

When asked about the research issues and questions that respondents were grappling with in their ICT4E programmes, respondents presented the following set of varied responses:

- ICT as a tool to enhance the quality of: teaching and learning/ mathematics and science teaching / knowledge acquisition/ traditional literacy skills 25% (5)
- ICT use for learner assessment and examination security 20% (4)
- ICT for Teacher Professional Development 10% (2)
- Technology-pedagogy integration 10% (2)
- Needs assessment of 21st Century skills for curriculum development in different subject areas 10% (2)
- ICT Infrastructure for schools 10% (2)
- Development of ICT competency and performance standards 10% (2)
- Benefits and challenges of 21st century learning and assessment in education 5% (1)
- ICT curriculum for higher order thinking 5% (1)
- ICT software for primary level 5% (1)
- Research funding 5% (1)
- ICT security and maintenance in under-resourced schools 5% (1)
- Relevant ICT content for different school levels 5% (1)

There were few respondents who presented their research issues and priorities in question format. The following unusually succinct response was an exception where the respondent presents questions on ICT use as a tool for enabling blended use of traditional and new technology approaches for communication and innovative teaching and learning:

- *How does the primary school teacher blend the African traditional forms of communication with modern technology to establish a learner familiar content which will enable the pupil not only to learn about ICT but also learn with and through ICT?*
- *What type of training do we give to our 21st century teacher so as to move along with the ever changing times and technology?*

Responses such as this indicate that amongst this group of respondents there is a high level of awareness of the complexity of ICT integration in traditional educational

systems. There is also an emergent understanding of technology infusion as requiring rigorous thought about teaching and learning with regard to:

- the traditional view of the learning process;
- teacher preparation in technology use as a tool to facilitate new learning environments;
- technology potential to enable conducive learning environments where learners take greater responsibility for their own learning and construction of knowledge.

Promising practices

When asked whether they had identified ‘promising’ practice/ models for ICT integration responses were again varied. Although it is difficult to generalize from the diversity of models and approaches identified, the dominant practices in use seemed to focus on models for e-content development/ generation and evaluation which were mentioned by 20% (4) of respondents and collaborative networking, saturation and e-learning models also mentioned by 20% (4). Student centred learning models (self directed learning/ peer collaboration) were mentioned by 15% (3), approaches for using ICT in assessment (databases/ performance classification/ authentic assessment / portfolios / exhibitions / demonstrations / journals) by 15% (3), and digital portals by 5% (1). There were 5 (20%) of respondents who did not answer this question.

In another related question, respondents were specifically asked to identify approaches, models/ tools for enabling effective use of ICT in their particular areas of work. Among the most frequently mentioned were:

- Appropriate policies to support ICT integration
- Frameworks for e-content policy, development and implementation
- Platforms/ websites/ e-groups for online collaboration/ networking, data processing and e-resources
- Models for technology use to enable pupil-centred learning and assessment for learning
- Teacher training models for creative use of technology - to develop learner critical thinking skills using project oriented, problem solving strategies
- Teacher Competency Standards for 21st Century Learning
- Availability of infrastructure, connectivity and equipment to support ICT use in teacher professional development and teaching and learning
- The use of radio programmes for teaching different school subjects

Unsurprisingly given that the respondents were drawn from national curriculum networks and organizations, these responses would seem to indicate a view of technology use as an enabler for system wide educational transformation - in which technology is leveraged through policy, curriculum, standards, e-content, teacher preparation, collaboration networks and infrastructure to customize educational delivery and move it from a teaching to a learning system of provision.

ICT4E trends in Programmes

When asked about the ICT4E trends observed in their work programmes, respondents listed the following:

- Development of Information Management Systems for Examination Coordination/ Performance Assessment
- Introduction of critical thinking/ collaboration/ assessment for learning in curriculum frameworks
- ICT perception as an enabler for faster access to information and improved quality in education
- ICT use for communication with experts, peers and the outside world
- ICT introduction in curriculum syllabuses as a core and elective subject and/or as embedded across all curricular subject areas at all educational levels
- ICT literacy emerging among teachers and students
- ICT penetration in public/private schools
- Gap in ICT integration between rural/ urban zones, public/private schools, theory/practice, rhetoric /impact
- ICT misconception as solely linked to computers disregarding older technologies (radios/ TV), and newer technologies (mobile phones)

The trends reinforce the evidence of emerging shifts from traditional perceptions of learning for technology skills acquisition to learning with and through technology. However the trends also reflect emerging disparities in educational provision that undermine an inclusionary vision for technology integration in systems.

ICT4E Issues for research in GeSCI's five thematic areas

Respondents were asked to identify issues for research linked to the five 'thematic areas' around which GeSCI has developed its knowledge building and research activities. Numerous issues were identified by respondents with respect to research that would improve ICT integration in their education systems. The listing of respondents views on issues and gap areas for research and development are presented under each of the five thematic areas:

1. Educational Management and ICT

- Research into ICT policies, strategies and curriculum frameworks for directing system wide ICT integration
- Knowledge creation and sharing tools
- Development of leadership skills to effect change
- Evaluation of the impact of leadership capacity building for ICT implementation
- Investigating models for online examination which do not compromise reliability and validity
- Multi-stakeholder partnerships
- Practices to maximize ICT use in education

- Use of ICT to improve management practice at classroom level
- Use of ICT to collect data on student assessment and tracking / on school performance and assessment

2. ICT Infrastructure, Connectivity and Accessibility

- Standards
- Development of off-line resources
- Mobile e-learning models with minimum dependence on infrastructure and connectivity requirements
- Examinations on-screen /via CDs
- Use of mobile phones for teaching /learning in rural communities
- Testing appropriate ICT infrastructure (satellite) and connectivity (fiber optic cable) for development contexts
- TCO of ICT infrastructure

3. Integration of ICT into Teaching and Learning

- Frameworks, strategies, methodologies and implementation options for ICT in under-resourced education systems
- Efficiency and effectiveness of ICT use in Education
- Strategies and benefits of ICT integration in teaching and learning
- Vertical and horizontal integration of ICT in the curriculum
- Use of ICT in subject learning across the curriculum
- Scenarios of ICT integration in teaching and learning
- Benefits of e-content to assist teaching and learning in large classes
- Identification of ICT career opportunities for curriculum development
- Development of e-assessment models for assessment for learning
- E-Readiness of teachers on the African Continent
- Training needs of Teachers/School Heads for ICT integration
- Teacher awareness and perceptions of ICT integration in teaching, learning and assessment

4. Teacher Education and ICT

- Transformation / reform of models for Teacher Professional Development
- Off-line and on-line training models for teachers and other stakeholders in the use of ICT
- Life skills training using virtual organizations
- Do we need skilled teachers to teach ICT?
- ICT use in continuous professional development to improve teaching and learning
- Using ICTs to assist teachers attain national educational objectives
- Investigating curriculum content overload in Teacher Training Colleges
- Networking Infrastructure for Teacher Training Colleges
- Appropriate pedagogical use of ICT in Teacher Professional Development
- Training teachers for leadership roles for ICT implementation and innovation
- Linking pedagogy to technology use in teacher education
- Evaluation of ICT integration in programmes

5. Educational content and ICT

- Standards and evaluation criterion for quality e-content
- Multi-media student-centred life-skills content for virtual labs
- What type of educational content do we need for ICT integration?
- What are the tools for effective delivery of content to the learner?
- What is the profile of personnel for ICT curriculum development at secondary and TVET levels?
- E-content development in financially constrained environments
- Evaluation frameworks to assess open source and proprietary content
- Relationship between content development, skills acquisition and ICT integration
- Streamlining of curriculum design and content development to align with 21st century skills requirements
- Content development for open and distance education
- Development of ICT content appropriate for different cultural contexts and with accessible materials for learning

It would seem that the focus for research is centred on the efficacy and effectiveness of ICT use to address issues of access and quality in education systems in development contexts. The broad range of research issues identified would also represent a research continuum for examining ICT use in education for system improvement to its use for system transformation.

Research partnerships and dissemination

Respondents were asked to suggest partnerships at local, regional and global levels that the AKE could explore and develop to strengthen its research agenda. 12 respondents (60%) identified Ministries of Education as the principle partner for research collaboration, with curriculum units and universities identified by 6 (30%) and 5 (25%) respondents respectively. Teacher training institutions, teachers, school nets, the inspectorate and examination boards each received mention by 3 (15%) respondents. On the other end of the spectrum pupils, the private sector and policy makers each received a mention by 1 (5%) of respondents. Regional NGOs and organizations such as SADC (Southern African Development Community), ECOWAS (Economic Community of West African States), ERNWACA (Educational Research Network for West and Central Africa) and ESACO (Eastern and Southern Africa Curriculum Organization) were identified by 6 (30%) respondents, while 3 (15%) respondents identified the international networks of GeSCI (Global e-Schools and Communities Initiative), ISTE (International Society for Technology in Education) and LAQTFW (Learning and Technology World Forum) as potential partners and networks for developing research collaboration on ICT in Education (Figure 1).

Research Partnerships and Networks

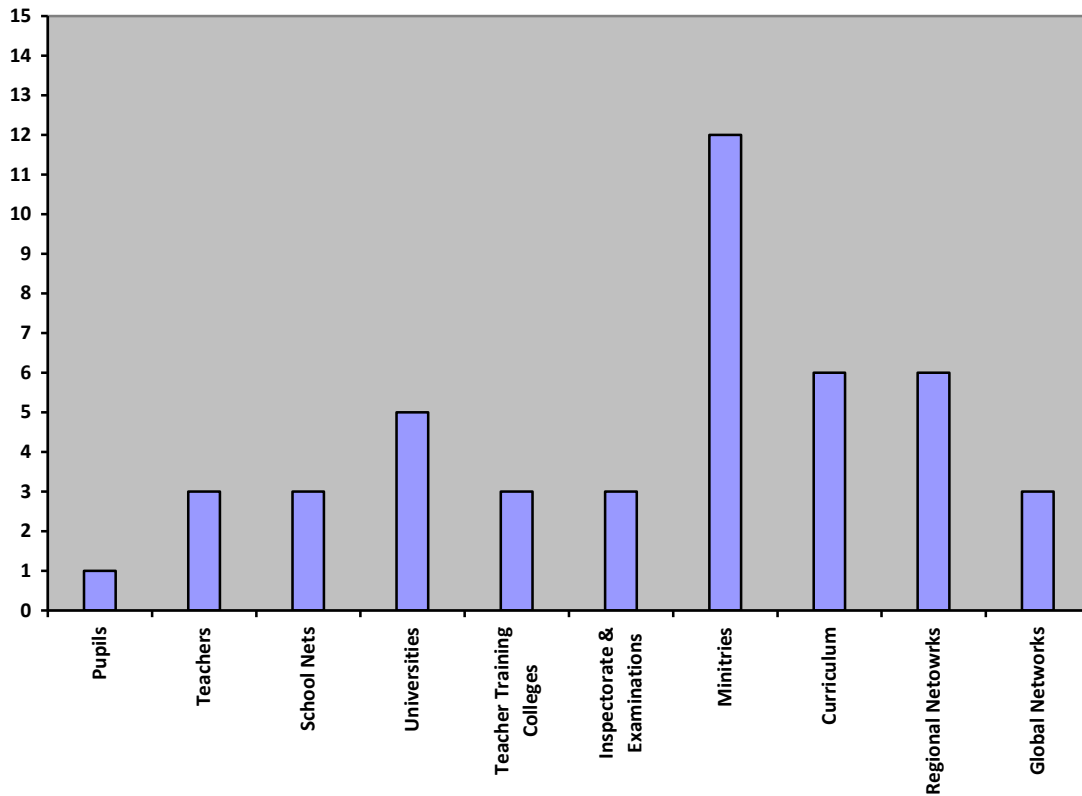


Figure 1: Research partnerships and networks

When asked with whom the AKE community should share research results, the most dominate groups identified were personnel in assessment, evaluation and inspectorate departments and boards as mentioned by 40% (8) of respondents, with personnel in Ministries of Education mentioned by 40% (8), and in Curriculum Departments and Institutions mentioned by 30% (6). Politicians and policy makers were mentioned by 25% (5) of respondents. Teacher Education and University personnel were identified by 20% (4) while teachers and learners were mentioned by 25% (5). One lone respondent identified the Media. At regional and global levels 15% (3) of respondents identified conferences, seminars and workshop opportunities for sharing results with regional communities such as UNESCO and NEPAD e-Schools. At a global level 15% (3) of respondents identified international organizations and entities such as GeSCI, UNESCO, UNICEF, USAID (Figure 2).

Sharing Research Results

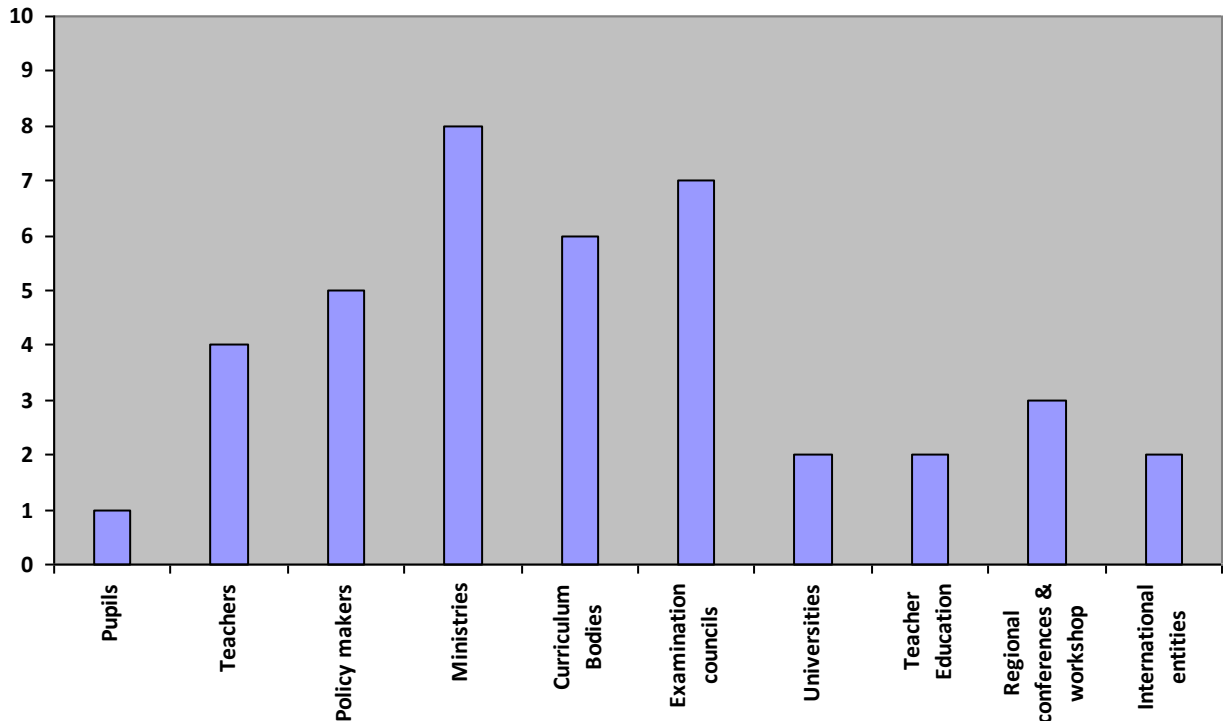


Figure 2: Dissemination of Research Results

In interpreting these figures it would appear that the predominant partners identified for research networks and dissemination would be ministries and curriculum and examinations departments and boards. It should be remembered however that respondents were drawn principally from these entities. Nevertheless respondents have identified an expansive dimension of networks and organizations from local to regional and international levels for developing research partnerships and disseminating research results and models of innovative practice in ICT-Education.

Conclusions

This snapshot of research issues is based on a sample of participants attending the third multi-country workshop of the African Knowledge Exchange on the theme of *ICT Curriculum and Assessment for 21st Century Knowledge Societies*. The sample is thus a small and purposive one. It is still clear however from the views expressed by this group that there are many different and innovative practices in ICT utilization emerging from education systems across eastern, western and southern African regions. There is also a definitive requirement for research to enrich the knowledge and improve the choices available to GeSCI's development partners in the Africa region.

The evidence drawn from those consulted in this survey would indicate that:

- the greatest need for information is in the use of ICT in Teaching and Learning and the scaffolding elements of curriculum, assessment and e-content
- there is a high level of understanding and awareness amongst respondents of the complexity of ICT integration in traditional educational systems and the restructuring in teaching and learning that technology infusion should promote
- there is an emergent view of technology use to customize educational delivery and move it from a teaching to a learning system
- the broad range of research issues identified by respondents would represent a research continuum for examining ICT use for system improvement to examining its use for system transformation – from investigating the TCO for infrastructure and connectivity to examining the flexible use of mobile technology in teaching and learning
- networks and organizations from local to regional and international levels need to be created and/or strengthened for developing research partnerships and disseminating research results and models of innovative practice in ICT-Education.

This is the first in a series of surveys that GeSCI will conduct at national and regional workshops among its regional partners in Africa, Asia and Latin America. **GeSCI's research agenda will continue to evolve on the basis of such on-going consultation and inquiry with partners and researcher providers.** Determining which issues are to be addressed will contribute significantly towards defining GeSCI's research framework and the operationalization of our new strategic vision for building *Knowledge Societies* in our fields of partner engagement.