



Association for the
Development
of Education
in Africa

Dialogue on education for leadership and change



THE WORKING GROUP ON MATHEMATICS AND SCIENCE EDUCATION (WGMSE)

2012 INTEGRATED REPORT OF ACTIVITIES

EXECUTIVE SUMMARY

Main Thrust of the 2012 WGMSE Work Programme and Budget

The focus of the Working Group on Mathematics and Science Education (WGMSE) is improvement of quality of mathematics and science education in Africa through capacity development of teachers and education managers. Japan International Cooperation Agency (JICA), in collaboration with Kenya's Ministry of Education, supports this capacity-building programme that targets member countries of the Strengthening of Mathematics and Science Education in Western, Eastern, Central and Southern Africa (SMASE-WECSA) network.

The Centre for Mathematics, Science and Technology Education in Africa (CEMASTEА) which coordinates the WGMSE implements the capacity building programme. The programme includes training courses and technical workshops for dialogue and exchange of ideas on effective classroom practices based on the active involvement, student-centred, experimentation and improvisation guided by the constant improvement cycle of plan, do, see and improve; in short ASEI-PDSI pedagogical paradigm. Under the programme, technical assistance on construction of sustainable in-service education and training systems is also offered to SMASE-WECSA member countries. CEMASTEА also spearheads the WGMSE's advocacy and networking activities by organising an annual regional conferences and hosting delegations from member countries seeking to learn more on how to improve their mathematics and science education.

In 2012, the WGMSE was mapping out its future beyond 2013 and hence hosted a conference at the end of the year to pursue policy dialogue with stakeholders to come up with strategies that would ensure that the network of mathematics and science educators already created is sustained by African Governments and bringing on board additional partners. The area of focus was the setting-up of sustainable in-service education and training (INSET) systems for mathematics and science teachers with support of African Governments and strengthening of the coordinating institution CEMASTEА.

Execution of the 2012 Integrated Work Plan and Budget

Due to the increasing focus on the role of quality science, mathematics and technology (SMT) education in providing essential foundation for the development of the science technology and innovation sector (STI), the WGMSE activities are of significant relevance to the needs of African countries. However, a number of challenges still hamper the successful implementation of teacher capacity-building programmes and the translation of learning into actual classroom practice. These include; lack of supportive policies on teacher professional development, teacher shortage, under-qualification, limited resources, broad curricula, and inconsistencies in attendance of INSET where it is available. To enhance translation of INSET learning into actual improvement of classroom teaching and learning, member countries have been encouraged to identify areas of their common interest and organize country-based workshops. Through this, they dialogue on themes that can help solve problems unique to their circumstances. Technical workshops that bring several member countries to address a commonly identified theme have provided forums for further dialogue on effective translation of

INSET into classroom practice. WGMSE organized a successful workshop in 2012 bringing together 39 educators from 18 countries.

Dissemination of information has still remained a challenge though better ways of communication i.e. through bulletins and brochures were adopted where explored during the Triennale and COMEDAF. However, a one-time-off meeting may not be very helpful in sharing best practices. The WGMSE was therefore to be hosted on temporarily on a website that CEMASTEIA was developing. This, though not yet finalised will ease information dissemination within the network.

1. INTRODUCTION

1.1. Brief on the Strategic Objectives of the ADEA Medium Term Plan (2008-2012)

Through the 2008-2012 Strategic Medium Term Plan (SMTP) ADEA sought to first and foremost encourage the development and shared understanding of coordinated and effective action on the part of the stakeholders mainly responsible for tackling the major challenges facing educational development in Africa. It also aimed at contributing to achieving the aims of continental and regional integration within the education sector, as defined by the African Union and its Plan of Action of the Second Decade of Education for Africa (2006-2011) and the Science and Technology Consolidated Plan of Action.

Additionally, the SMTP aimed at producing knowledge and lessons drawn from successful experiences in areas that are critical to the qualitative transformation of education in Africa. Such knowledge and lessons would strengthen policy and build capacity for reform. Through the SMTP ADEA also aimed at disseminating as widely as possible the messages and findings accumulated through policy dialogue, analytical research and exchange, in order to support the sharing of knowledge, mutual learning and capacity-building. Last but not least, the SMTP sought to improve the performance of ADEA in the areas of management, planning, evaluation and reporting, while also strengthening institutional capacity and organizational mechanisms.

On its part as mentioned earlier, the WGMSE mainly focused on activities aimed at inspiring collaborative approach by the SMASE-WECSA network member countries to addressing the quality of mathematics and science education in Africa. This has done through advocacy to education policy makers, sharing of successful experiences and promising approaches from the member countries, capacity-building of teachers and education officials on effective practices in the teaching and learning of mathematics at basic education level through conferences, technical workshops and the Third Country Training Programme conducted by CEMASTEА with JICA's financial support.

1.2. Financial situation

In 2012, the WGMSE Lead Agency JICA provided both technical and financial support to the WG through the SMASE Kenya Project totaling US\$ 687,300.00. This was spent on the following activities:

1. Third Country Training Programme at CEMASTEА (including travel and accommodation) for 160 teachers/teacher educators from member countries:
= \$2,700 x 160 trainees = \$432,000
2. 2nd Technical Workshop held in July 2012 in Nairobi
= \$1,500 x 60 participants = \$90,000
3. 12th SMASE-WECSA Conference in November in Nairobi 2012 (Travel, accommodation and conferencing for 60 participants)
= \$165,300

During the same period, the Government of the Republic of Kenya graciously provided staff and facilities at CEMASTEА for implementing the WGMSE activities.

2. IMPLEMENTATION OF STRATEGIC OBJECTIVES

2.1. Synoptic overview (see attached Matrix)

STRATEGIC OBJECTIVE 1						
To encourage the development and shared understanding of coordinated and effective action on the part of the stakeholders mainly responsible for tackling the major challenges facing educational development in Africa						
High level outcomes: (i) Creative, African-led responses to the problems of education in Africa are increasingly reflected in national educational policies, reforms and programs; (ii) African perspective reflected in international arena, esp. in the debates and initiatives related to existing international framework agreements; (iii) A more open, informal environment is created with respect to policy dialogue on educational development; (iv) Strategic partnerships are formed or strengthened between education ministries and other stakeholders.						
Priority fields of activity	Planned Activities	Outputs		Cost		
		Expected	Achieved	Budgeted	Realized (audited)	Execution rate
A strong African-led initiative for enhancing the quality of mathematics and science education in the continent	Participate in conferences, symposia and display of WG materials i.e. pamphlets, newsletters and magazines in the displays.	<p>Become visible to stakeholders involved in education and in particular in the area of mathematics and science education.</p> <p>Presentation of papers on mathematics and science in conferences and symposia.</p>	<p>Participated in ADEA Triennale in February 2012 Burkina Faso, where the concept of the ASEI lesson was presented to the public through video. A display and give away brochures, training materials, improvised materials, and magazines were also done.</p> <p>Kenya's experience in establishing sustainable professional development system for teachers was shared during the Improving Mathematics, Science & Technology in Basic Education Summit 2012 in September in Johannesburg South Africa</p>	EEs		

Interaction of policy makers and education practitioners for sharing of good practices in mathematics and science education	Participation in relevant international workshop on lesson improvement	Enhanced understanding on in-service training in mathematics and science for teacher development	Kenya's model for teacher professional development shared by CEMASTEAM at the Improving Mathematics, Science and Technology in Basic Education Summit 2012 held in September in Johannesburg South Africa The Strengthening Mathematics and Science Education (SMASE) in Africa 2012 conference brought together senior education officials from 28 countries.			
STRATEGIC OBJECTIVE 2						
To contribute to achieving the aims of continental and regional integration within the education sector, as defined by the African Union and its NEPAD (New Partnership for Africa's Development) program through the Plan of action of the Second Decade of Education for Africa (2006-2011) and the Science and Technology Consolidated Plan of Action						
High level outcomes: (i) Enhanced progress at the national level toward achieving the objectives of the AU's Second Decade of Education; (ii) Increased sharing of experiences and pooling of expertise and resources between African ministries of education; (iii) Operational mechanisms and instruments for continental and regional integration established and operational through and for education						
Priority fields of activity	Planned Activities	Outputs		Cost		
		Expected	Achieved	Budgeted	Realized (audited)	Execution rate
Support the AU/NEPAD intervention	Training of mathematics and science teachers from SMASE WECSA member countries through JICA-supported training programmes offered by CEMASTEAM.	Increased numbers of trainers of trainers for member countries	153 TOTS trained in CEMASTEAM from 27 countries and 1 Observer from Djibouti.			

	Offer Expertise services in the area of mathematics and science capacity building to education officials.	Understanding and further dialogue through study of the SMASE Kenya programme. Benchmarks set for the trainers and trainees in evaluation of the training programmes in their countries	A delegation of 16 high ranking education officials from the Federal Republic of Nigeria conducted a study tour of SMASE Kenya between September 17-21, 2013			
STRATEGIC OBJECTIVE 3						
To produce knowledge and lessons drawn from successful experiences in areas that are critical to the qualitative transformation of education in Africa, in order to strengthen policy and build capacity for reform						
High level outcomes: (i) Increased quantity and quality of relevant information on effective policies and practices for the development of education in Africa; (ii) More effective linkages and knowledge sharing among African governments, researchers, academics and civil society organizations; (iii) Enhanced capacity of African ministries and other members of the African education community to analyze and put to use recommendations emerging from evidence-based research.						
Priority fields of activity	Planned Activities	Outputs		Cost		
		Expected	Achieved	Budgeted	Realized (audited)	Execution rate
Documentation of ASEI-PDSI Booklet	<ul style="list-style-type: none"> Compilation of the ASEI PDSI Booklet 	ASEI-PDSI Booklet produced and shared	Manual shared during Triennale	EEs		
Teaching of Mathematics and Science in member countries.	Technical workshop	INSET Providers to share on challenges and interventions they are taking in their countries towards the sustainability and improvement of the subjects and to come up with possible session content to be adopted by member countries.	39 ducators from 18 countries developed strategies to address challenges faced by member countries and suggested training content. They also made recommendations for next technical workshop, WECSA conference and JICA-supported training programmes offered by CEMASTE.A.			

3. NARRATIVE REPORT

3.1. Strategic objective 1

3.1.1. The SO1's main thrust for WGMSE 2012 Program was to encourage the development and shared understanding of coordinated and effective action on the part of the stakeholders mainly responsible for tackling the major challenges facing educational development in Africa. WGMSE activities mainly focused on realizing the high level outcomes of a creative, African-led responses to the problems of education in Africa are increasingly reflected in national educational policies, reforms and programs and strategic partnerships are formed or strengthened between education ministries and other stakeholders

3.1.2.

The WGMSE participated in ADEA Triennale in February 2012 Burkina Faso, where the concept of the ASEI lesson was presented to the public through video. A display and give away brochures, training materials, improvised materials, and magazines were also done. During the Caucus of Ministers of Education a presentation was made about the SMASE network and its Strategic Plan to African ministers. Additionally, in March 2012 during the COMEDAF in Nigeria, a presentation was again made to African ministers on the network and its Strategic Plan. Kenya's experience in establishing sustainable professional development system for teachers was also shared during the Improving Mathematics, Science & Technology in Basic Education Summit 2012 in September in Johannesburg South Africa.

These activities contributed to the interaction of policy makers and education practitioners for sharing of good practices in mathematics and science education and contributed to enhanced understanding on in-service training in mathematics and science for teacher development

3.2. Strategic objective 2

3.2.1. SO2's main thrust for 2012 Program was to contribute to achieving the aims of continental and regional integration within the education sector, as defined by the African Union and its NEPAD (New Partnership for Africa's Development) program through the Plan of action of the Second Decade of Education for Africa (2006-2011) and the Science and Technology Consolidated Plan of Action. In this regard, WGMSE activities were mainly directed at realizing the high level outcomes of enhanced progress at the national level toward achieving the objectives of the AU's Second Decade of Education and increased sharing of experiences and pooling of expertise and resources between African ministries of education.

3.2.2. WGMSE mainly planned to support the AU/NEPAD intervention by training of mathematics and science teachers from SMASE-Africa countries

through JICA-supported training programmes offered by CEMASTEА. In this regard, 153 TOTs from 27 countries and 1 Observer from Djibouti were trained. Understanding and further dialogue through study of the SMASE Kenya programme when a delegation of 16 high ranking education officials from the Federal Republic of Nigeria conducted a study tour of SMASE Kenya between September 17-21, 2013

3.3. Strategic objective 3

3.3.1. The SO3's main thrust for 2012 Program was to produce knowledge and lessons drawn from successful experiences in areas that are critical to the qualitative transformation of education in Africa, in order to strengthen policy and build capacity for reform. Focusing on the high level outcomes: (i) Increased quantity and quality of relevant information on effective policies and practices for the development of education in Africa; (ii) More effective linkages and knowledge sharing among African governments, researchers, academics and civil society organizations; (iii) Enhanced capacity of African ministries and other members of the African education community to analyze and put to use recommendations emerging from evidence-based research.

3.3.2. WGMSE planned to undertake several activities aimed at realizing the cited high level outcomes. One of these was to document the ASEI-PDSI pedagogic paradigm for sharing. A booklet was produced and shared during the Triennale. To support practioners translate the ASEI-PDSI in class, a Technical Workshop was planned to enable INSET Providers to share on challenges and interventions they are taking in their countries towards the sustainability and improvement of the subjects and to come up with possible session content to be adopted by member countries. The workshop was held in Nairobi where 39 educators from 18 countries developed strategies to address challenges faced by member countries, possible INSET session content and draft INSET programmes for the member countries and recommendations for next technical workshop, SMASE-WECSA conference and JICA-supported training programmes offered by CEMASTEА. A website to provide an on-line database where publications on best practices in teacher education as well as effective classroom practices can be posted and to disseminate the WGs activities, write-ups, manuals, publications was to be constructed. In this regard, CEMASTEА website was constructed, content managers trained and ICT officers to manage the website employed. However, a specific site dedicated to the WGMSE is yet to be created on the site.

3.4. Strategic objective 4

3.4.1. The main thrust of SO4 for the 2012 Program was to disseminate as widely as possible the messages and findings accumulated by ADEA

through policy dialogue, analytical research and exchange, in order to support the sharing of knowledge, mutual learning and capacity-building. For WGMSE, specific attention was paid to attaining the high level outcomes of improved communication between ADEA, its members, key partners and other stakeholders in African education.

3.5. Strategic objective 5

3.5.1. The SO5's main thrust for the 2012 Program was to improve the performance of ADEA in the areas of management, planning, evaluation and reporting, while also strengthening institutional capacity and organizational mechanisms. Expected as high level outcomes would be increased relevance of ADEA's (general program and WG) activities and initiatives; increased effectiveness of ADEA's (general program and WG) activities and initiatives; increased efficiency of ADEA's (general program and WG) activities and initiatives; and redefinition of the respective roles of and relationships between ADEA and key players in African educational development.

4. CONCLUSIONS:

4.1. Main Lessons Learned

- 4.1.1. Several African countries have started country-based INSET programmes modeled after the Kenyan SMASE programme and enriched by the Zambia school-based approach. This demonstrates willingness among countries to learn from and replicate good practices.
- 4.1.2. Kenya taking the lead to coordinate the collaborative activities between African countries within the SMASE network, with the support of JICA, has been recognized by UNDP (2009) as good practice case of a south-south triangular cooperation. It has shown that an African lead initiative with adequate financial support base can have a big ripple effect across the continent. The American Association for the Advancement of Science Centre for Science Diplomacy (2009) also cites SMASE-WECSA as an important initiative in the development of human resources and science and technology to support East Africa Community's regional integration.
- 4.1.3. The influence of INSET activities that have been implemented nationally since 2004 for mathematics and science teachers in Kenya; have finally led to an entrenchment of teacher professional development in the latest education policy paper. Additionally, a law has been enacted in the country to maintain standards of teaching by making continuous professional development mandatory for all teachers. A teacher competency framework has also been developed.

4.2. Recommendations

- 4.2.1. Given the role that CEMASTEAs have played as a centre of excellence in leading the SMASE network, it would be important that other African

countries also join hands in supporting the centre. ADEA Secretariat should therefore champion the case of CEMASTEAs being a continental centre supported by African governments through the African Union since they are mutual beneficiaries.

- 4.2.2. It would be also important for ADEA Secretariat to spearhead with the African Union the replication of CEMASTEAs in other RECs to reduce costs and enhance ownership.

5. APPENDICES

5.1. List of Publications

1. ASEI-PDSI approach: A paradigm shift towards learner-focused teaching and learning practice in mathematics and science education in Africa.

REFERENCES

UNDP (2009). *Enhancing south-south and triangular cooperation: study of the current situation and existing good practices in policy, institutions, and operation of south-south and triangular cooperation*. [online] Available from http://southsouthconference.org/wp-content/uploads/2009/10/E_Book.pdf. Accessed January 2, 2013

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