F.No.13-4/20009-EE-17
Government of India
Ministry of Human Resource Development
Department of School Education and Literacy

New Delhi, dated 25th February, 2010.

To

SPDs of all States/UTs

Subject:- Forwarding of minutes of the Outcomes of the Brainstorming Workshop on "Devising Strategies for implementation of Computer Aided Learning (CAL) in Elementary Education" – regarding.

Dear Sir/Madam,

I am directed to forward herewith the minutes of the Outcomes of the Brainstorming Workshop on CAL held on 15th and 16th September, 2009 at Scope Complex, Lodhi Road, New Delhi for information and further necessary action, please.

Yours faithfully,

(A.K. TEWARI)
Under Secretary to the Govt. of India.

SPD/PS/1452/09-17
8.3.10

Encl.: **as above.**

PO(CALC)
09.03.10

OUTCOMES OF THE BRAINSTORMING WORKSHOP ON "DEVISING STRATEGIES FOR IMPLEMENTATION OF COMPUTER AIDED LEARNING IN ELEMENTARY EDUCATION"

A Brainstorming workshop for devising strategies for implementation of Computer Aided Learning (CAL) in elementary education was held on 15th and 16th September 2009 at Scope Complex, Lodhi Road, New Delhi. The workshop was attended by distinguished educationists, academicians and representatives from selected States besides the officials from MHRD and EDCIL India Ltd. The list of participants is annexed at **Annexure – I**.

2. Mr.Jitendra Kumar Panda, Consultant (CAL), TSG welcomed all participants. The workshop was chaired by Ms. Neelam Rao, Director, MHRD. In her inaugural address, she discussed the backdrop of such a workshop and expectations from the workshop.

   She mentioned that lots of ground has been covered under SSA for CAL like Headstart in MP, CALToonZ in Delhi and home based initiatives in other states. Moving from DPEP, the central focus of SSA has been the improvement of learning enhancement, especially at Primary level. But it is felt that a lot has still to be done for upper primary level. In this context, it was felt important to make ICT and CAL to be focusing more at Upper Primary level. The assumptions on which this thinking was based were, firstly the emerging digital divide and secondly the unavailability of subject specific teachers at school level. It was expected that CAL will strengthen and empower the teachers who doesn't have the subject background and take the subject knowledge to the students and also prove as an effective & efficient tool for communicating the limitations of the text book which is otherwise not possible through the conventional method.

   With this backdrop, it was recommended for ICT to be expanded to Upper Primary schools as a major goal during 11th Plan. To substantiate this on the part of SSA, norms were revised from 2008-09 and Fifty Lacs per district per year was provisioned.

   She also expressed that, as two and half year has passed and this is the right time to analyze and call out what has happened and what is to be done to modify the worrisome process. She expected that resource persons would recommend strategies for future actions and also assessment of existing CAL activities & software, as suggested by the 10th Joint Review Mission. She hoped that the recommended strategy would not be too re-inventive in approach but to look at what has been put in and how to make best use of it".

3. Following the welcome address by the chairperson, all participants introduced themselves, after which the session wise discussions started. Discussions in each of the sessions were based on specific issues. The resource group explicitly discussed on the issues & opined their views. The state representatives also shared the methodology & approach of their states for implementation of this intervention and their expectations from CAL.

4. **Suggestions of the Resource Group**

   4.1. ***Rationale and Need of Computers in Elementary Education***

   A. It's the Central Government policy to take in ICT as a very functional component in school education. Similarly the CABE has clearly mandated for junior computer labs to

be in place at schools. In SSA, use of computers have been put under a certain component in the framework. Use of ICT including computers certainly has to be augmented and synergized at schools for better outcomes.

B. Considering the text book limitations, lack of subject teachers; CAL is an effective, efficient & resourceful teaching-learning aid. It helps the teachers to efficiently overcome the limitations of the text books to elucidate and deliver the subject matter.

C. ICT integrated pedagogy can be delivered as remedial teaching tools. As learning level of different students can vary, this kind of tool can be handy and effective. The important change in education that is taking place with use of these tools is personalization of the learning experience. The effort for providing personalized learning experience to every child can be achieved with these tools which will help in deriving agreed learning outcomes for all children, which is a constitutional obligation.

D. There is of course enormous scope of ICT or computers in education but to get it done effectively we need to identify the learning objectives that can be achieved with such tools. The development of a set of can-do statements (Learning Objective Scale) for each subject and class will prompt and guide us to effectively use the tools to overcome the limitations.

4.2. ***Identification of Key Areas for Implementation***

A. There are two perspectives, Computers as a teaching learning aid and computers as a skill development curriculum. However, broadly the implementation may be around the following areas:

a) Technology education
b) Technology integrated education
c) Technology integrated school governance
d) Technology integrated academic management
e) Technology integrated resources management

However, since need, capacity and adaptableness vary from state to state; states will do good to adopt specific approach that can be more appropriate & effective for them to derive positive outcomes. In this regard, the following are the basic steps:

a) Identifying the needs
b) Fixing up & prioritizing objectives
c) Finding out the technology based facilities
d) Planning for the convergence of the facilities
e) Accessibility of technology
f) Development of a feasible plan for effective use of the facilities

B. The first priority objective should be that, the content & delivery mechanism should be good so that it delivers on the objectives for which it has been made & has a very testable mechanism through which it could be tested and has the scope for further improving it.

A mechanism needs to be created whereby enormous amount of contents, teaching learning materials may be developed, put together & availed at a place from where

teachers, if required will adopt it. It may be a wide range of materials such as multimedia, animation, a set of digitized text, set of digitized pictures, a set of poetries with illustrative still pictures, a set of puzzles etc.

Also different institutions especially colleges, university departments may be invited, involved for supporting this kind of resource development and capacity building programmes through project based assignments. States should be encouraged to explore mechanisms to use the institutional capacity/ strength, for materials development.

Sarva Sikhya Abhiyan is a countrywide national flagship programme. SSA and its associated bodies across different states also have enough competence to do this. Provided a proper kind of action plan is developed and followed, implementation of activities like setting up technology infrastructure, material development and capacity building are possible in-house.

C. However technically, CAL is subset of much larger configuration, i.e. ICT. Presently, the CAL strategy seems to be an artifact of SSA framework, which appears to be very restrictive in nature to allow only certain infrastructure into school education system.

The use of technology in education for delivering effective learning outcomes must be redefined and rationalized. The framework structure should be open and allow states to identify, plan, develop and use technology & materials as per their requirements.

If technology for education is envisaged, it's not only CAL or computer labs. There may be a mix of technologies to create opportunities for exploring technology aided teaching-learning process in a multidimensional approach. The technology should be used for a reasonable purpose to overcome any of the limitations of the education system.

As the scope of CAL is very limited, it could be termed as TAL (Technology Aided Learning) or TEL (Technology Enabled Learning), which would enable to explore all possible technologies.

D. According to NCF, 2005, the definition of the transformed classroom should describe the resources and its use by the teachers. We should not continue with our own way of looking at a classroom, where the text book, the state prescribed syllabus and state controlled devices of passing on information to the students and testing becomes the only mechanism for education. It is to be emphasized that the pedagogy for the transformed classroom requires the integration of technology in a decentralized manner.

E. A national level support system should be made available for helping teachers & students on different subjects which can be facilitated by use of ICT. Teaching-Learning communities may be created to extend their help to develop a central resources repository as a national level support system. This kind of central repository should facilitate mechanisms for uploading, sharing and also evaluation of materials,

tools, resources, products by teachers, students, parents, media experts, instruction designers.

F. The future ICT integrated framework should be based upon the abilities and inabilities of ordinary students and teachers, who can achieve minimum teaching and learning goals.

G. A collaborative learning atmosphere for teachers has to be provided for effective use of ICT tools and materials. The advantage of collaborative mode is to work with number of ideas including stories, puzzles, magic, questions, songs etc., as suggested by NCF, 2005.

4.3. *Strategies for Implementation*

A. On Implementation Model

- BOOT model may be adopted as temporary stop gap arrangement by the time the States should be empowered and be able to take the possession of future activities. The spirit of BOOT model should be to transfer the resources to schools not to the state authority. The scope of this model is to train and empower each teacher in the school itself, if this does not happen; the BOOT model is a failure.

B. On Fixing up Objectives/ Target Setting

- Technology should not be used at all to replicate existing resources, but more beyond that promoting collaborative learning, explorative learning, peer group learning.

- It is important to set up indicators for proper implementation and fixing up ways to achieve them is the strategic planning. To transform technology power to effective classroom transaction process, it is very important to identify the needs and then invest strategically for deriving best results.

- As there are different schemes and different programmes implemented at the school level, the objective of the state should be to synergize the availability of all resources at schools broadening the scope of their optimum use.

- CAL or Computer Assisted Learning with its present approach under SSA appears as a constricted method of providing a technology based teaching aid to teachers. The scope needs to be broadened. Even a good poem, a photograph, a blank word processor with spellchecking facility also can be a resource. Somewhere along the way, the utilities of this kind of resources need to be defined in the context of teaching learning activities. Technology can enable enrichment of appropriate resources.

- The system of putting in 3-4 computers in attachment will not help the teaching learning process in deriving any positive outcomes. For successful implementation of this kind of technology based intervention, a teacher should be enabled to identify, the use of technology and the processes to happen to take ahead technology aided teaching learning in the classroom. SSA being an enabling

process, the States should identify their situational gaps and the ways to overcome it with a technology based approach.

- Self learning is also another dimension of looking at achieving educational outcomes with the help of technology.

C. On Infrastructures & Maintenance

- Considering the present need for larger expansion across the country, thin client, virtual client solutions are one way of expanding computers capability and accessibility. However states may take the help of the State Technical Agencies/ Societies/ DIT to find out an appropriate model to meet their requirement which is cost effective instead of direct procurement. States may develop a whole set of ideas for optimized use of existing resources, which will create opportunities for saving money and expanding more.

- Broadband internet connectivity should be provided to all schools for resource sharing and exploration, wherever there is a reach of telephone. DIT can be approached to provide an internet connection to the schools wherever there is a telephone connection. Solar powers may be used as alternative power sources where power is not available. A good comprehensive state plan may overcome artificial barriers at all levels.

- Maintenance is another issue which incurs huge amount of resources unnecessarily. Some mechanism may be developed to deal this effectively. One of the solutions for this may be a kind of live CD. The entire OS and whatever content is required to be put for the system may be put into one CD, so that the system BOOTS from the CD itself and runs other software without the hard disk.

- States should try to explore the opportunity to involve technology savvy, experienced & enabled volunteers from local community for the maintenance & up keeping of hardware articles and technical empowerment of teachers.

D. On Contents/ Materials

- States should not be encouraged to procure readily available content materials as they don't serve the purpose for substantiating the teaching learning processes. It should be ensured that digital contents, materials provided for supplementing the teaching learning process are not exact replication of textbooks

- The thrust should be on development of huge amount of contents, resourceful material involving local teachers. Contents may be on anything from mathematics, science, language to art, music and dance. It should be a new paradigm to allow the teachers to explore resources, ways & means of using them on their own rather than some one instructing them to do it.

Ideally the content development process may include the following steps:

- Suggestive Content Development Process
  - ⇨ Fixing of educational objectives for each content CD
  - ⇨ Training of teachers on situation analysis & Scripting
  - ⇨ Validation of scripts on various check points
  - ⇨ Digitization
  - ⇨ Testing
    - o Format evaluation
    - o Small Group evaluation with children & then teacher
    - o Summative evaluation after one year for revision
  - ⇨ Testing of objectives achieved with pre test & post test results

E. On Capacity Building

- The time & situation demands reconstruction of the capacity building activities programmes. The objective of the capacity building programme should be empowerment of teachers for knowledge creation and delivery.

- The approach could be to figure out the varieties of activities that could be done using this tool and having a mechanism to reach out teachers for use by them. It may be active sharing & critiquing mechanism around the hardware and software tools. The capacity building programmes should empower the teachers to extend the usability of resources & drawing out number of solutions depending upon the situation of the classroom.

  For effective handholding, the teachers should be trained to design an interactive content with existing presentation tools. Sample packages containing digital graphics, pictures, audio & video clippings should be provided to the teachers so that at the end of the training programmes they can design their own contents, which could be evaluated by them and other teachers by sharing between themselves.

- The formation of Resource group of trainers at each state will be very useful. Faculties, academicians, research scholars in different universities in all states have rich pedagogic experiences which have not been tapped till now. They should be involved and their localized experiences must be used to develop workable models, materials as per the state specific needs.

- The objective of the capacity building programme should enable the teachers to extend the usability as per the situational need and empower them for knowledge creation. For skill development, rugged technology based trainings are not necessary as technology changes very fast. The teachers must be given the flexibility to use these resources as per their interest. They should be provided with interesting materials which generates their interest to use it further.

- For capacity building, good training modules need to be developed. It will be excellent to use the online mode if internet facility can be availed. To train teachers

on computer skill level course the online mode through internet would be most suitable. Refreshers programmes or contact programmes may be add-ons. However, as online training has very limited contribution to emotive involvement, the online and offline activities could be balanced so that it could be an effective capacity building activity. Emotional involvement of teachers may certain bring better results.

F. On Monitoring/ Evaluation

- There are prescribed kind of mechanisms for taking comments regarding difficulties in use and contextual errors for betterment of contents. As a part of the capacity building process, teachers should be involved in content development process in a participatory mechanism. This will make the teachers feel like having their ownership of the programmes which will encourage them to do it themselves rather than supporting from outside.

4.4. *Assessment of Existing CAL Tools*

A. Objective & Scope

The objective behind the assessment or evaluation should be to learn from the efforts made in the past. It may be useful to find out the best mix of models, which may be suggested for future. We may specifically need the information from the states which will enable us to critically review the existing practice.

B. Structure

The assessment may be carried out by a working committee facilitated by MHRD & TSG. The structure of the committee may include academicians, educationists from different organizational backgrounds including experts and representatives from the states.

The objectives, which were expected out of the existing CAL programme, may be the parameters for assessment.

C. Parameters & Methodology

1. A comprehensive current status report from all states may be asked to draw a national level assessment.
2. A team or a mechanism can be facilitated through which information from all states can be collected and documented. State specific reports should be on different dimensions of CAL.
3. Data may be quantitative and qualitative. The quantitative data in a structured format may be asked from the states. The different suggestive dimensions under which data may be collected are as in the format, annexed at **Annexure – II**. This format may be developed & refined further and more points may be added to it for obtaining a clear picture of the grass root level implementation process.
4. The Analysis/Case study of materials like CALToonZ, Headstart and materials/ contents from ten different states may be done on priority basis.

The workshop ended with vote of thanks to the chair.

Brainstorming workshop on "Devising Strategies for Implementation of CAL in Elementary Education" on 15th & 16th September 2009 at Scope Complex, New Delhi

LIST OF PARTICIPANTS

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SARVA SHIKSHA ABHIYAN SAMITHI - KARNATAKA

Monthly Expenditure for 1st Quarter

Sl. No.	Interventions	Outlay Approved for 2010-11	April		May		June		Cumulative total for the 1st Quarter	
			Amount	% age	Amount	% age	Amount	% age	Amount	% age
1	Teachers Salary	43175.92								
2	Civil Works	40561.83								
3	Free Text Books	1063.50					850.8	80		
4	Maintenance Grant	5018.95					4015.16	80		
5	TLE	192.00					134.4	70		
6	School Grant	4170.22					3336.176	80		
7	Teacher Grant	1131.30					905.04	80		
8	Teachers Training	3767.48	113.02	3	113.02	3	113.02449	3		
9	Community Training	679.21								
10	IED	3757.53								
11	REMS	953.91								
12	Management & Quality	5643.60								
13	Innovative Activities	3000.00								
14	BRC	1303.92								
15	CRC	4286.92								
16	OOSC	4673.24								
17	State Component	1036.12								
18	SIEMAT									
19	NPEGEL	587.87								
20	KGBV	1813.52								
21	Community Mobilization	493.00	46	9						
	Total	**127310.04**								

SARVA SHIKSHA ABHIYAN SAMITHI - KARNATAKA

Monthly Expenditure for 2nd Quarter

Sl. No.	Interventions	Outlay Approved for 2010-11	July		August		September		Cumulative total for the 2nd Quarter	
			Amount	% age	Amount	% age	Amount	% age	Amount	% age
1	Teachers Salary	43175.92							0.00	
2	Civil Works	40561.83								
3	Free Text Books	1063.50			212.70	20				
4	Maintenance Grant	5018.95			1003.79	20				
5	TLE	192.00			57.60	30				
6	School Grant	4170.22			834.04	20				
7	Teacher Grant	1131.30			226.26	20				
8	Teachers Training	3767.48	489.773	13	489.77	13	263.724	7		
9	Community Training	679.21								
10	IED	3757.53								
11	REMS	953.91								
12	Management & Quality	5643.60								
13	Innovative Activities	3000.00								
14	BRC	1303.92								
15	CRC	4286.92								
16	OOSC	4673.24								
17	State Component	1036.12								
18	SIEMAT									
19	NPEGEL	587.87								
20	KGBV	1813.52								
21	Community Mobilization	493.00	46	9.3	70.00	14	26.00	5.30		
	Total	**127310.04**								

SARVA SHIKSHA ABHIYAN SAMITHI - KARNATAKA

Monthly Expenditure for 3rd Quarter

Sl. No.	Interventions	Outlay Approved for 2010-11	October		November		December		Cumulative total for the 3rd Quarter	
			Amount	% age	Amount	% age	Amount	% age	Amount	% age
1	Teachers Salary	43175.92								
2	Civil Works	40561.83								
3	Free Text Books	1063.50								
4	Maintenance Grant	5018.95								
5	TLE	192.00								
6	School Grant	4170.22								
7	Teacher Grant	1131.30								
8	Teachers Training	3767.48	414.42	11	489.77	13	452.10	12		
9	Community Training	679.21	0.00		169.80	25	169.80	25		
10	IED	3757.53								
11	REMS	953.91								
12	Management & Quality	5643.60								
13	Innovative Activities	3000.00								
14	BRC	1303.92								
15	CRC	4286.92								
16	OOSC	4673.24								
17	State Component	1036.12								
18	SIEMAT									
19	NPEGEL	587.87								
20	KGBV	1813.52								

21	Community Mobilization	493.00	96.00	19.50	48.00	10.00	130.00	26.4		
	Total	**127310.04**								

SARVA SHIKSHA ABHIYAN SAMITHI - KARNATAKA

Monthly Expenditure for 4th Quarter

Sl. No.	Interventions	Outlay Approved for 2010-11	January		February		March		Cumulative total for the 4th Quarter	
			Amount	% age	Amount	% age	Amount	% age	Amount	% age
1	Teachers Salary	43175.92								
2	Civil Works	40561.83								
3	Free Text Books	1063.50								
4	Maintenance Grant	5018.95								
5	TLE	192.00								
6	School Grant	4170.22								
7	Teacher Grant	1131.30								
8	Teachers Training	3767.48	414.42	11	414.42	11				
9	Community Training	679.21	169.80	25	169.80	25				
10	IED	3757.53								
11	REMS	953.91								
12	Management & Quality	5643.60								
13	Innovative Activities	3000.00								
14	BRC	1303.92								
15	CRC	4286.92								
16	OOSC	4673.24								
17	State Component	1036.12								
18	SIEMAT									