PRISM_ Phase-I: Individual Innovator Proposals

Category II: Fabrication of Working Model/Process Know-how/Testing & Trial/Patenting/Technology Transfer

Samar J. Singh, PhD

August 29, 2014

Contents

Conformance statement

Eligibility

I declare I am an Indian Citizen holding an Indian passport Number: Z2850879, and believe that this proposal represents multiple innovations.

Innovation components

The objective of this submission is to support a proposal to enhance education in government schools in Karnataka. We propose to do this with a an additional component of education delivered for 5 hours a week in Grade 6,7 and 8 in the first instance using the AGEM method.

The objectives are to enable participating government schools in Karnataka to become the preferred schools in their communities.

The AGEM method relies upon wireless feedback response technology, pre-prepared topic plans with embedded questions, archival and analyses of student response, and real time graphical displays of class response for more than 100 students at a time.

The specific innovations are in the design of wireless feedback response technology, learning content, delivery methodology, feedback methods, and analysis of archived responses.

There is a twenty year background to this work that has involved setting up two international schools, auditing international schools around the country, and working with children who find themselves in difficult circumstances through poverty, natural disasters or HIV/AIDS in India, SE Asia and Vietnam. This is based on a twenty five year record of working in academia and serving as Visiting Faculty in tertiary education institutes in several countries including Singapore, Sweden, China and Australia.

Scope and Support

1. Our project cost of 18.535 lakhs lies within the permitted range of 5 lakhs to 35 lakhs
2. We provide a “more rigorous demonstration of our original idea/invention/know-how in the form of working prototype/processes” and “its testing and trial.”
3. Our proposals demonstrate “novel delivery models to take Science and Technology innovations to effect inclusive growth” through improving the learning environment in government schools in Karntaka.
4. Our proposal falls under the “technology or knowledge intensive area”.
5. The maximum support we seek is under 20 lakhs.

1. Cover Page

Covering letter to the PRISM application

Date 29 Aug 2014

To:

The TOCIC

Chandigarh

Sub: Proposal for Development of Revitalizing Public Schools - Infusing modern content with innovative Technology.

Dear Sir/Madam

I am herewith submitting my application for support under PRISM. The following documents are enclosed.

- ☑ Signed Copy of Application
- ☑ Proof of Residence
- ☑ Innovation: Wireless feedback devices + educational methods
- ☑ Documentary Proof of Prior Work (video, photo, press coverage etc)
- ☑ Work Planned
- ☑ Profile of Potential User
- ☑ Copy of Aadhaar Card

Saman J. Singh
Innovator

2. Title of the proposed project

Revitalizing public schools - infusing modern content with innovative technology

3. Applicant details

3.1. Name of the applicant

Samar Jit Singh

3.2. Father’s name/Husband’s name

Father’s name: Jang Bahadur Singh(deceased)

3.3. Postal address

C510, Sterling Residency
#80 RMV II Stage, Dollars Colony
Bangalore - 560094
Mobile: +91 90199 97070
Email: samar@agem.in

3.4. Present address

As above

3.5. Permanent address

As above

3.6. Address of Organization/Institute

Not applicable

3.7. Profession

(Please tick as applicable)
[ ]Faculty
[ ]Doctor
[ ]Scientist
[ ]Housewife

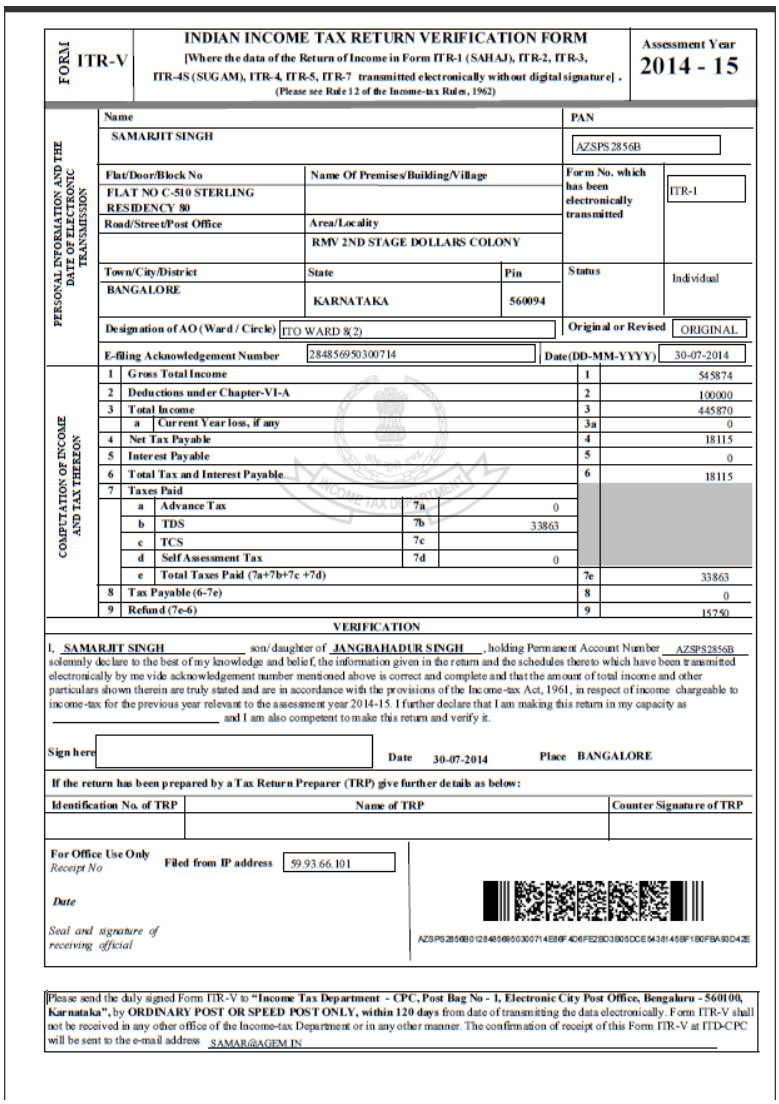
[ ]Student
[ ]Farmer
[x] Any other: Former university academic and current education activist.

3.8. Personal details

- Date of Birth: 46/08/21
- Educational qualification: PhD - University of Wales, College of Cardiff.
- Annual Income of the applicant: Rs. 5.5 lakhs

3.9. Financial details

3.9.1. Income Tax Return AY2014-15



FORM ITR-V

INDIAN INCOME TAX RETURN VERIFICATION FORM

[Where the data of the Return of Income in Form ITR-1 (SAHAJ), ITR-2, ITR-3, ITR-4S (SUGAM), ITR-4, ITR-5, ITR-7 transmitted electronically without digital signature] .
(Please see Rule 12 of the Income-tax Rules, 1962)

Assessment Year **2014 - 15**

PERSONAL INFORMATION AND THE DATE OF ELECTRONIC TRANSMISSION

Name			PAN
SAMARJIT SINGH			AZSPS2856B
Flat/Door/Block No	Name Of Premises/Building/Village		Form No. which has been electronically transmitted: ITR-1
FLAT NO C-510 STERLING RESIDENCY 80			
Road/Street/Post Office	Area/Locality		
	RMV 2ND STAGE DOLLARS COLONY		
Town/City/District	State	Pin	Status: Individual
BANGALORE	KARNATAKA	560094	
Designation of AO (Ward / Circle): ITO WARD 8(2)			Original or Revised: ORIGINAL
E-filing Acknowledgement Number: 284856950300714			Date(DD-MM-YYYY): 30-07-2014

COMPUTATION OF INCOME AND TAX THEREON

1	Gross Total Income			1	545874
2	Deductions under Chapter-VI-A			2	100000
3	Total Income			3	445870
a	Current Year loss, if any			3a	0
4	Net Tax Payable			4	18115
5	Interest Payable			5	0
6	Total Tax and Interest Payable			6	18115
7	Taxes Paid				
a	Advance Tax	7a	0		
b	TDS	7b	33863		
c	TCS	7c			
d	Self Assessment Tax	7d	0		
e	Total Taxes Paid (7a+7b+7c +7d)			7e	33863
8	Tax Payable (6-7e)			8	0
9	Refund (7e-6)			9	15750

VERIFICATION

I, SAMARJIT SINGH son/daughter of JANGBAHADUR SINGH, holding Permanent Account Number AZSPS2856B solemnly declare to the best of my knowledge and belief, the information given in the return and the schedules thereto which have been transmitted electronically by me vide acknowledgement number mentioned above is correct and complete and that the amount of total income and other particulars shown therein are truly stated and are in accordance with the provisions of the Income-tax Act, 1961, in respect of income chargeable to income-tax for the previous year relevant to the assessment year 2014-15. I further declare that I am making this return in my capacity as _____ and I am also competent to make this return and verify it.

Sign here | Date 30-07-2014 | Place BANGALORE

If the return has been prepared by a Tax Return Preparer (TRP) give further details as below:

Identification No. of TRP	Name of TRP	Counter Signature of TRP

For Office Use Only
Receipt No
Date
Seal and signature of receiving official

Filed from IP address: 59.93.66.101

AZSPS2856B012846569503007 14EB6F4D6FE2BD3B05DCE543814 58F1B0FBA93D42E

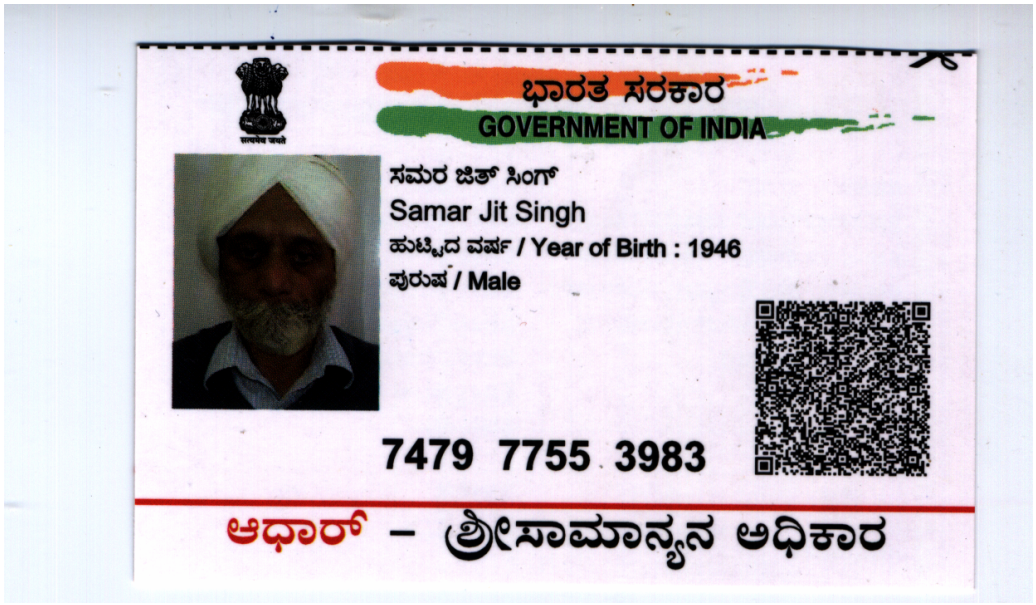
Please send the duly signed Form ITR-V to **"Income Tax Department - CPC, Post Bag No - 1, Electronic City Post Office, Bengaluru - 560100, Karnataka"**, by **ORDINARY POST OR SPEED POST ONLY, within 120 days** from date of transmitting the data electronically. Form ITR-V shall not be received in any other office of the Income-tax Department or in any other manner. The confirmation of receipt of this Form ITR-V at ITD-CPC will be sent to the e-mail address SAMAR@AGEM.IN

3.9.2. PAN No. (mandatory)

AZSPS2856B

3.9.3. Aadhar Number

7479 7755 3983



4. Details of work done on innovation so far

I would recommend a quick review of a 5 minute video[1] which provides:

- an overview of the problem we are trying to address
- the general objectives we seek to achieve
- the strategic goals we aim for
- the uniqueness of the approach
- the impact of a pilot study in a school for the weaker segments of our society

4.1. Literature survey/patent search

This work has been developed over more than a decade employing a "Needs Analysis" approach involving extensive interactions with groups ranging from children with HIV/AIDS to more than 7000 fellow educators worldwide undertaking On-line courses with Stanford University[2], to Professors of the Harvard Graduate School of Education. During this period I have also set up two International schools from base, where our ideas were challenged by ground realities in Bangalore. In the circumstances, I feel the approach below is more likely to indicate the preparatory background to this work.

4.1.1. Current state of educational technology vs our approach

4.1.1.1. Feedback technology and current usage

Feedback devices or personal response devices have now been used for more than a decade in various formulations overseas. However, they tend to be used at the university level in the United States and are often focused on multiple choice questions. In any event, as a result of cost and battery drain they are unrealistic in the Indian Government school context.

4.1.1.2. Our approach

The uniqueness of our approach comes from approaching the issue from a different angle. We started with **what** needs to be achieved, and **how** it needs to be achieved in learning terms, in lower income schools. Over the last two decades I have drawn from experience with students in many settings and also from what neuroscience is telling us about learning[3], to define the type of technology we may want, and how we may want to use it. The mechanisms by which the data generated is analyzed, presented and used is a pertinent factor in the overall performance of our system.

[1] This is a video introduction to a final project on a Stanford University online course which briefly introduces the ideas underlying this proposal.

[2] including "Technological Entrepreneurship" and "Designing a New Learning Environment"

[3] Please refer to the downloadable book I helped produce, "Learning Schooling and the Brain", available at http://www.agem.in/pdf/LSB.pdf

4.2. Development work done so far, including involvement of agencies, consultation with experts

Considerable work has been done since 1998 on the **process and the mechanisms - including technology -** by which learning can be enhanced in terms of scalability, effectiveness, affordability, and measurability with a view to enhancing the quality of education in government schools in our country.

1998-2000: setting up of Vidyashilp Academy in 1998 where I was permitted to define the academic regime and first implemented a feedback system using what are now known as "Clickers". This approach was based on my background in Cognitive Engineering which had implications for the educational system as a whole. A central principle was that "feedback delayed is learning denied".

2001: While on a 3 month assignment to the Maldives for the Foreign and Commonwealth Office in the capacity of an Expert to the Minister for Transport and Civil Aviation, I took the opportunity to study the pros and cons of the Maldivian system of education. This formed part of the final report to the Foreign and Commonwealth Office. Report available on request.

2001: Participated in an online interactive course by the Harvard Graduate School of Education on "Assessing for Understanding" with 62 other educators from around the world during my tenure in the Maldives. Certificate available on request.

2004-2007: Volunteered with Janaagraha for designing and implementing a civic education program across 40 schools in Bangalore.

2005-2009: Consultant, University of Cambridge International Examinations auditing international schools across the country. Endorsement email **here.**

2005-2008: Child Led Social Equity Assessment project in Tamil Nadu and Kashmir, HIV/AIDS Stigma and Discrimination project for DFID funded project with children in 5 states, evaluation report of children's projects in 5 Tsunami affected countries. These were all conducted for Plan India. Reports available on request.

2006: Consultant, Plan International - Evaluation Projects in Vietnam (2006) in the field of child rights. Also created a successor project implemented by Plan Vietnam called the Youth Empowerment System whose overall goal was to reduce the incidence and intensity of physical and emotional punishment meted out to children in Plan Vietnam's Program Unit provinces. Reports available on request.

2007-2008: Restored the failed Mastery International school in Bangalore into Trio World School, approved by Cambridge International Examinations (CIE) for IGCSE and A Levels. Also developed the 4th generation of feedback devices and the instructor software. Also contracted with Harvard Graduate School of Education to jointly mount a seminar on "Mind, Brain and Education" to re-direct Indian educational policies for the future.

2008-2013: Various Professional education programmes with Stanford on Technology Entrepreneurship(with Distinction), Designing a New Learning Environment (with Distinction), and with Harvard Graduate School of Education on Mind, Brain and Education (2008)

2009-2010: Conducted a Pilot Program for 22 students in Maths. Redesigned software to cater for the previous limit of 19 devices per coordinator.

2013-2014: Set up a program in Danddeli to provide free education using our system for English instruction for about 40 children from local govt. schools. This is now concluded.

2014: Put a proposal to Government of Karnataka for introducing our system into local government schools on a phased basis. The Government of Karnataka has indicated they have accepted this proposal which has stimulated this submission.

4.3. Patenting of the innovation

There is no intention to patent this innovation during this phase. The key to this innovation lies in the complex interplay between the structure of the program, the content and embedded questions, the assessment methods, the representation of the responses, and the analysis of archived performance which provides many insights about the student, the quality of delivery, the quality of the material etc. We look to eventually subsidizing public school services with private sector profits and will patent the technology at that stage.

4.4. Tie-up for design, fabrication etc with any external agencies

Hardware: More than 20 year collaboration on hardware and driver software with a company in the United Kingdom

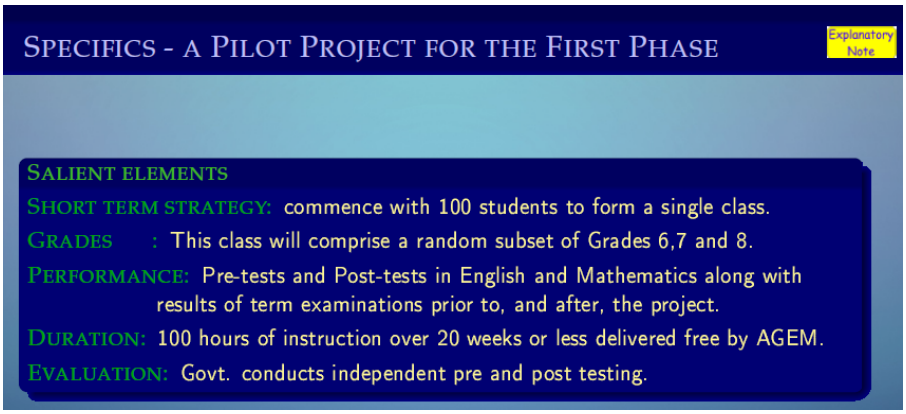
Driver software: Seven year collaboration with software design and development expert in Latvia

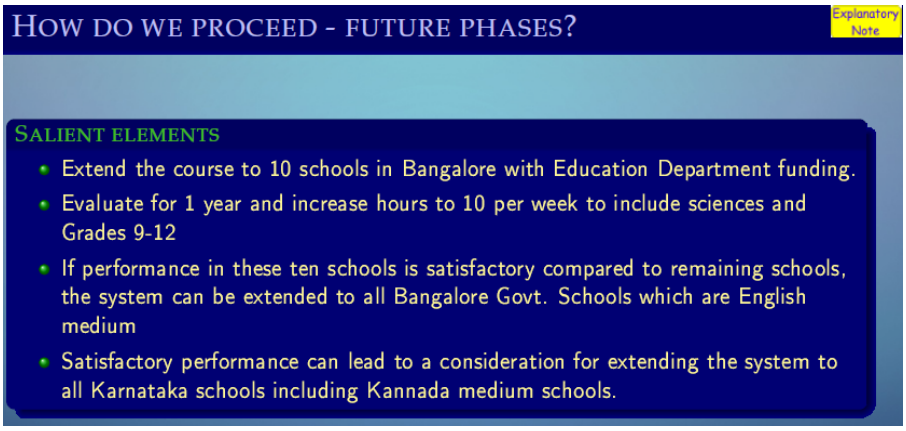
Application software: Fifteen year old collaboration with programmer in United States/India.

4.5. Techno-economic / market feasibility studies /reports, if any

- We have sought and on at least two occasions have been offered funding for setting up a venture to pursue a project for generating revenue by catering exclusively to private schools. However, having already set up two schools catering to high income families and offering the Cambridge GCSE and A Level qualifications, I rejected these options which would be focused solely on provision of this system to private schools. A spreadsheet of the financials for the private school venture is offered **here.**
- We have also devised a strategy to cross subsidize government schools as part of a revenue generating venture. That is included in Part VI of the document **here.**
- As part of the Stanford University course on "Technological Entrepreneurship", we analysed the strategies we had used for getting this project up and running. A report of the analysis of responses from 47 respondents comprising three different populations of teachers at a local school, students at a journalism school, and principals and administrators of a chain of elite schools is **attached here.** We came to the conclusion that we had been unsuccessful in defining the customer for the product. After much consideration we decided that the customer would be an owner-principal on the grounds that in private schools only owner-principals were sufficiently impacted to want to incorporate this program in their school. We made a presentation to 3 schools and two immediately accepted the program. In general owners who were not principals were reluctant to modulate an existing revenue stream emanating from their school and principals who were not owners saw no need to modulate their existing system. We made a presentation to three schools and obtained confirmation of interest from two. We eventually concluded that the Minister for Primary and Secondary Education would be the person most likely to see the value of this project. In brief we felt that a policy level initiative was needed. We tried to work with the Harvard Graduate School of Education to mount their MBE program for policy makers but the high cost of the program and the absence of government interest combined to thwart this initiative at the central level.
- It has taken us time to devise a plan for working with government and getting access to a high enough authority in government to present it to. This we did on 7 July 2014. A week later during our meeting the Minister personally arranged a meeting with Director, DSERT for the same day, where I had an opportunity to present our program and its rationale to a DSERT group that included the Deputy Director. I was informed by the Deputy Director directly after the presentation

that they would support the program. We received the workorder from Director, DSERT on 25 August 2014 for the first of the four phases defined in our proposal . The presentation to DSERT with embedded explanatory notes has been embedded **here.**

- The proposal to the Hon'ble Minister cited Five phases for the project with each phase being dependent on the success of the previous phase. These are cited below:
  - 

  - 

4.6. Consumers / users feedback, if any

July 2014: The presentation to the Hon'ble Minister for Primary and Secondary Education, Govt. of Karnataka was the first form of validation where the Minister directed the Department of State Education and Training to consider the proposal and report back. The Department has agreed to issue a work order to that effect after listening to the presentation and receiving the proposal.

April 2010: We conducted two sessions while on a visit to Chennai in 2010. We had no prior experience with the students or the institutions. The first was for a set of graduating MBA students on Decision Making Processes and the second was intended for a Class 5 audience that was substituted by a group in Class 9 and 10, who were subjected to our first lesson plan for Mathematics i.e. The concept of number. The report is embedded **here** and makes interesting reading.

4.7. Any other

1. The report for the DNLE on-line course with Stanford University is embedded **here**

5. Brief write-up giving broad details of the original idea/ invention/ IPR/ Know how available with the individual, highlighting its originality/Novelty and the scientific principle involved therein.

5.1. Broad details

5.1.0.3. The stimulus

Recently, the govt. of Karnataka accepted the first phase recommendation of my plan of action for incrementing education in govt. schools (Appendix A). The objective of this plan is to reverse the decline of govt. schools participating in this program, through an infusion of technology driven education for about 1 hour a day on average.

5.1.0.4. The AGEM system

AGEM has developed and tested mechanisms for improving education - through small injections of meaningful education - over the last 17 years. A key element of the process is the development of individual feedback devices for students so that all students even in large classes can be active participants in the learning and assessment process. These methods and processes have been used in two schools, several NGO projects, presentations to principals and professionals, as well as in a pilot program for 22 students at a school catering for very poor children.

Key elements of the system include the projection of pre-prepared lesson plans with embedded questions which students answer using the feedback devices. These responses are immediately represented in an appropriate graphical summary and projected for the class to see within seconds. All responses are stored for archival, analysis, and reporting.

5.2. Know-how highlighting its originality and the scientific principle involved

More than two thousand years ago, Socrates is reputed to have said that “Education is the kindling of a flame, not the filling of a vessel”. While the thought is more than two thousand years old, it has yet to permeate our system of education.

5.2.1. Originality

Few would argue that government schools need to change in order for the country to progress but this is a monumental task. That important task is hindered by the stranglehold of the examination system on the one hand and teacher ability on the other.

Our system strives to provide a complementary injection of education unencumbered by either the examination system or by teacher ability. Indeed we would say that the ability to invoke the teacher as a facilitator in a externally managed process has scope both for educating the teacher into a reformed process and at the same time providing meaningful education for large numbers of students. When a critical mass of teachers and students have been energised into new ways of thinking, the process of educational reform will have begun for teachers to recreate in schools the education they have themselves experienced.

5.2.1.1. Changing the eco-system

We seek to achieve the following outcomes with our system, which are unique in the government schools context.

- make assessment fair, neutral and devoid of public humiliation
- invoke efficient learning without homework or textbooks.
- permit large classes to become an advantage rather than a problem.
- harness the energy of adolescence through working with Grades 6, 7 and 8.
- make teachers partners in the new system.
- demonstrate that meaningful education works better than verbal, physical and mental abuse for class management.

5.2.1.2. Specifics

More specifically, the originality of this innovation stems from:

- the purpose built feedback devices - one per student - which are our fourth generation design focused on the specific needs of our own curriculum. These permit over a hundred students to respond in parallel.
- The curriculum which manifests as pre-made multimedia Topic Plans[1] with embedded questions which serve various functions stretching from student assessment to lesson plan evaluation. This curriculum is designed to develop the skills needed when students enter tertiary education or the workplace after a decade. Our focus is on making the student a lifelong learner by learning how to learn.
- The representations both textual and graphic which provide the class an immediate summary of the response of each student without identifying the student. These stimulate conversations that are moderated by the teacher.
- Large classes - 60 to 100 students - provide richness of analysis so that each student can identify their own individual responses in the context of the class response. At the same time confidentiality of the student is maintained.
- Archival and analysis of student responses for facilitating optimum methods of delivery as well as improving performance of students, teachers and Topic Plans
- The ability to provide this education for multiple grades of classes as our content seeks to build on strong fundamentals which address the future needs of academia and industry. These will in Grades 9 and 10 encompass entrepreneurship skills and mathematical modeling of real life problems.

Perhaps the most significant originality is in the multiplexing of the technology, software outputs and well researched content that can be delivered to large classes in multiple locations India-wide.

[1] We differentiate these from lesson plans as we see ourselves free to take as many lessons as are needed to complete that integrated learning that is characteristic of the Topic Plans.

5.2.2. Scientific principle

5.2.2.1. Feedback

Quality and immediacy of feedback are salient elements of productive work. Boud and Malloy point out - albeit in the context of higher and professional education - that feedback has a double duty. The first is,"not to just improve immediate performance of students on their current tasks and educational outcomes, but to build their capacity to use feedback for their own ends."

They go further to say that students need "to build high levels of self-regulatory activity so they can plan and manage their performance, monitor themselves and utilise all manner of persons and processes to generate what they need to be effective practitioners." This they cite as the second value of feedback.

In the school context, I would summarize this to say that we need to consider that "feedback delayed is learning denied", if we are to work with children to develop the capabilities for a productive future.

5.2.2.2. The neurobiology of learning

More importantly, my interactions with Prof. Kurt Fischer of the Harvard Graduate School of Education (HGSE) created awareness of the complex mechanisms by which learning takes place - not necessarily linearly.

Immordino Yang and Damasio's work has highlighted the role of emotion in facilitating learning and Immordino Yang's research with fMRI scans and researching the neurobiology of learning have yielded valuable insights into the learning process. Alden Blodget and I have endeavored to make this learning more widely available by making our electronic publication, "Learning, Schooling and the Brain" freely available for download here. This book represents a comprehensive statement of many of the scientific principles behind our method.

5.2.2.3. The rationale of this PRISM submission

We would at this stage like to design and produce 25 units of the next generation of feedback devices so that they can be ready for deployment in future phases of this program to improve the quality of the next ten government schools. We would like to have them ready for testing and student feedback within this first validation phase. In similar fashion the production of topic plans and the development of a distribution technology during this phase will be necessary if one has to cater to multiple schools with a school teacher in the classroom as opposed to doing it myself. These require a level of funding which is the reason for this application.

5.3. Description of working of the innovation (use sketch/drawing , patent,photographs, video to explain the working)

I repeat the video link to the 5 minute video which gives a broad overview.

5.4. Description of science behind the innovation

I would refer you to Section 18 of the paper embedded in Section 4.7, Section 5.2.2.2 of this submission, and our E-book available at http://www.agem.in/pdf/LSB.pdf.

5.5. Technology trends from the literature survey and patent search

At the simplest level, feedback devices or classroom response systems come in the form of “clickers”. These are the the most fundamental of feedback devices but allow merely 4 to 10 keys which can be used to enter numbers or specify the number of an option in a multiple choice quiz. This is what we started off with at the first school in 1998 in Bangalore.

The next level of technology is where there is a wider choice of keys to press. Hardware in this form can at the simplest level appear like mini keyboards with a small screen. At the highest level it can take the form of tablets such as the IPad which permit Internet access and provide the usual tools for calculation and writing.

The next genre of devices is the BYOD or bring your own device movement where students can log in and use their own smartphones for answering questions and quizzes.

However, none of these approaches is appropriate in the context of resource-strained government schools where full text capability is required and eventually local language capability.

5.6. Technological challenges in design and prototype manufacture based on innovator’s skill

5.6.1. The case for our current feedback device design

1. We have found that while free form writing is not needed all the time, it does comprise a vital element of the learning process. Hence a full keyboard requirement is essential. That becomes the first differentiating element of our design against the “clickers” that are in widespread use - but mostly in colleges rather than schools.
2. Battery life is crucial if one is to have large classes and offer this in Indian government schools. Most of the devices cited above need to be charged once a day or once a week. We felt that one year is the minimum time between changing batteries for our requirement for government schools. Our experience is that batteries will last about 2 years in our current product.
3. Low cost is an essential element of our requirement. The cost of our 5th generation devices which we would produce if this leads to mass implementation of our program, would be of the order of USD25 which in large numbers could be brought down to USD15 or less. For this project we would use our current devices which had a cost of about USD50.
4. Feedback devices such as IPads can also be a distraction in the classroom due to their multi-function capacity. For this reason, we use a projector to project the content - which comes with embedded questions carefully designed to satisfy a specific learning requirement - on the wall. This permits the class to focus on a single point for content and on their feedback devices for entering responses. Our current devices do not have displays fitted though the design permits such an addition and are very adequate for this project.
5. The design of the feedback devices has been defined by our own needs in the classroom. These relate to our specific requirements which include:
    a) viewing the response of upto 256 responders in real time as they type
    b) ability to record the up and down time of each key as it is typed
    c) ability to permit writing in Kannada with the English keyboard
    d) extended battery life of more than one year
    e) large range which exceeds 100 meters
    f) interface of the coordinating transceiver via a USB port
    g) no interference between classrooms in close proximity

5.6.2. The attributes of the new feedback device design

The primary attributes we will attempt to increment from the current design are:

1. Robust construction
2. Lower cost
3. Multiple Indian languages text entry
4. Capability to display what is being typed and to edit it.
5. Additional functionality e.g. instructor ability to blank students screens when desired
6. GPS tracking where these devices are stolen or misplaced
7. Embedded camera to photograph student and/or recognize student.
8. Swype display to allow faster input of text from a smaller keyboard
9. Monochrome displays

We do not expect to achieve all of these incremental attributes during this phase.

The primary challenges will come from arbitrating between our customized hardware design - as was done for the 4th generation devices - and using off-the-shelf modules while satisfying the requirement for lower costs.

5.6.3. Rationale for 25 units only

We need a minimum class size of about 20 students to test out the efficacy of the AGEM method. These 25 units will be the basis for testing the hardware robustness, the functional characteristics, and the student comfort with this design.

Should the government of Karnataka wish to move to the second and subsequent phases of the proposed project, such a scalable design will be needed to make those phases viable. The production can then be carried out with a relatively short delay. We visualize about 100 units per school will be needed.

5.6.4. Attributes of server

There are no particular challenges required in respect of server design and manufacture but we would consider the issue of embedding a projector module within the server box, and of using a solar array and a battery to drive the composite unit though that could be a later stage initiative.

5.7. Rationale for this initiative

5.7.1. Support by the Govt. of Karnataka

The Hon'ble Minister for Primary and Secondary Education, has supported the project and advised the Director, Department of State Education Research and Training to provide a feasibility report. That report has recommended that the Validation phase i.e. the current project under consideration be implemented. The letter is attached at Appendix A.

5.7.2. The general objective of this project

India is a land of contrasts. No contrast is so glaring as the contrast of wealth, purchasing power, and access to health resources. Many of these problems stem from access to quality education. In our

country, government schools, which should be the primary providers of education, are giving over that space to private schools through deficient delivery. In Karnataka the percentage of students going to government schools is 27% and declining. The general objective of this project is to make government schools the preferred providers of quality education for 80% of participating communities within the decade.

5.7.3. What is the primary symptom of the problem?

In order to achieve that outcome, the quality of government schools has to improve. The quality deficit is most apparent in the increasing gap between the education that schools provide and the attributes that Industry and academia need.This is illustrated most forcefully by the statement by Manish Sabharwal that the company he heads - Team Lease - only employs 5% of those who apply to it for a job. He also says that his company which is also a training company finds that 40% of those who apply need more than a year of remedial training to qualify.

5.7.4. What are the reasons for the problem

There are several reasons:

Inertia: The education system is hostage to many forms of inertia. The most fundamental is that the syllabus cannot easily be altered to meet modern needs as it involves retraining teachers, re-writing textbooks along with a host of other implications.

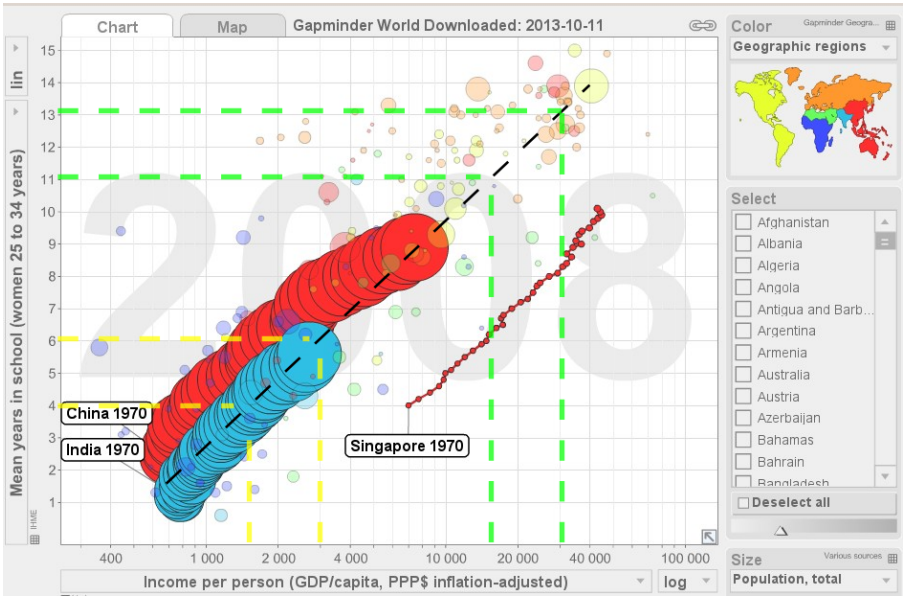
Scale: Karnataka alone has about 3 million students in Grades 6 to 8. It is difficult to use those staff who are part of the current system to change the system. The sheer scale of the enterprise would require an army of committed reformers willing to work to change the system.

For these and several other reasons, the possibility of reform of the education system to meet the needs of industry and academia is not on the cards in the near term. An essential element of our solution is that we leave these systems more or less intact while making education for secondary education more effective and more relevant to the needs of academia and industry.

5.7.5. What is the impact of the problem

An educational system that is out of step with real-world-needs creates several problems.

- Boredom in the student body and the teaching faculty
- High dropout rates which are well known particularly at the Class 5-6 transition and the Class 10-12 transition. Ultimately only a very small fraction go on to higher education.
- Poor quality of undergraduate education. If the fundamentals are not formed in the schools, this is a problem that will affect the quality of undergraduate education. This was forcefully expressed recently by the Vice Chancellor of Delhi University who noted that a company which wished to employ a large number of of Delhi University graduates ultimately chose only 3 after interviewing over one thousand.
- Impact on GDP particularly in respect of the contribution of women in the workforce who enter the workforce with insufficient school education. The figure below shows the relationship between years of education prior to entering the workforce and the GDP per capita adjusted for puchasing power parity and inflation.



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– In the picture above, each colored circle represents a country. The region is correlated by color with the diagram in the top right corner. The size is a function of the population. Where there are trails e.g. China, India, and Singapore, each circle represents a one year increment from the origin of the trail which in these three cases is 1970.
– The vertical scale indicates the mean of the number of years that women have spent in school for the subset of women who in 2008 were between 25 and 34 years of age. This period generally reflects the ages of working women.
– The horizontal scale indicates the GDP per capita adjusted across time and country for inflation and across countries by the principle of purchasing power parity.
– One can see from this that if we take the black dashed line as an approximate best fit trajectory for India then an increment of 2 years from 4 to 6 years (yellow dotted lines) leads to an increase in Income per person of about PPP$2000. However, an increase from 11 to 13 years leads to an increase of about PP$20,000. This makes the case for women's education specifically and for education generally.
  However, the figure above also shows an increase in PPP$ due to the spread which some countries, such as Singapore have to the right. Singapore in the mid 1960's focused on using school educational quality to position itself as a service provider to MNCs. It did not invest so extensively in University education till much later. More importantly, in the 1990's China modernized its education system to change its trajectory to the right thereby generating a higher Income Per Person.
– I would like to do that for India starting with Karnataka.

5.7.6. How will this project impact the problem

5.7.6.1. The characteristics of the solution

Scalability: As the lectures can be delivered over an Internet link there is no limit to the number of schools that can receive this. However, each school will need one classroom with sufficient feedback devices. Large classes are an asset in this system as the quality of representations of responses increases. Such classes can come from multiple grades within the Grade 6 to 8 and 9 to 12 segments.

Effectiveness: The solution requires only 5 hours a week in the first phase and ten hours a week in the second phase for Grades 9-12

Meaningful Content: This will centralize content generation to reflect the real needs of industry and academia particularly for the future. This content complements the content delivered by the school by providing learning by methods and practices gleaned from the latest research in neuroscience but does not compete with the current system.

Assessment: The content contains embedded questions which are used for several purposes that include assessment. This assessment will be centralized and used to improve the content as well as to guide students to improved performance based on discrete data for each student and each student group.

Database: This program has the potential to create one of the world's largest databases of school performance. This has various implications:

- for replacing high stakes examinations due to the large number of questions that are answered per lesson varying from about 10 to 30 per hour, thereby freeing teachers from following examination constraints and actually using that time for helping students learn. This will create a better instrument for student development, career guidance and evaluation.
- for the centralization of content and evaluation methods which will help create a narrower range of performance thereby allowing higher education and industry to be more effective in providing education and training.
- for revising content on the basis of extensive feedback or for tailoring content to suit cultural or geographical circumstances.
- for identifying the talent of each child and helping the child to explore, nurture and develop that talent.
- for integrating new and better methodologies for learning derived from worldwide research or culled from the vast database of performance created by this system.

Homework: There is no requirement for homework in this system though students may be encouraged to do projects and produce a portfolio for employers and universities.

Textbooks: There are no textbooks required for students on this project.

MOOCs: Many elite universities are today providing educational modules on subjects varying from artificial intelligence to entrepreneurship through the medium of Massive Online Open Courses (MOOCs). The defining characteristic required to take advantage of this invaluable resource is a meaningful education in the teenage years. I believe that students graduating from schools deploying the AGEM method will be ideal populations to take advantage of the opportunities that MOOCs generate.

5.7.7. How will impact be measured?

- In the past we have used placement tests developed and tested in the United States for the purpose of measuring academic impact and we will continue to do this. Past experience has shown that Grade 6 students are below the average level of Grade 3 placement tests both in English and Maths.
- Additionally, in this case, we hope to invoke the expertise of the Harvard Graduate School of Education to conduct independent testing for academic impact.
- We also expect to test the impact on the sense of well being of the children. For this we intend to use Seligman's CASQ[2], WHO-5 and the WEMWBS tests which represent established methods of measurement.
- In addition, the embedded questions in the topic plans are also used for measurement of student

[2]Children's Attributional Style Questionnaire

response and progress over the duration of the course.

- Finally, we measure changes in the end of term examinations prior to the program and those taken at the end of the program. This demonstrates that our students have learned how to learn and will therefore see an overall improvement across the board.

5.7.8. What is the overall design of the study

5.7.8.1. Selection of students

While we expect to test the full set of Grades 6, 7 and 8 for the study, we will select half the full set to form the experimental group while the remainder become the control group.

5.7.8.2. Pre and Post testing

The following tests are envisaged both before the start of the course and at the end of the course:

- Placement tests for English and Maths conducted by us.
- Specific tests for Systems Thinking
- Tests of explanatory style such as CASQ, WHO-5, and WEMWBS.

5.7.8.3. Conduct of the course

- We expect to conduct this for about 3 hours on Saturday's and about 2 hours at one other day in the week.
- The topics covered include English, Maths and Systems Thinking.
- The approach is generally interdisciplinary so a topic plan may cover all three disciplines
- We generally prefer longer classes to avoid the wastage of time that is involved in start up processes. Our experience has been that students can take our classes for 5 to 6 hours at a time with short breaks.
- We expect students to work on collaborative projects using computers and open source software as this is an important element of real-world environments.

5.7.9. What are the technology aspects of the project?

Technology in terms of hardware and software is deployed as follows:

Feedback devices: Our fourth generation proprietary feedback devices are wireless transceivers interfaced to a keyboard that operates on two AAA batteries which last for about 2 years in normal operation. We log details of any instance when any key is pressed or released. The current version is the 4th generation of hardware and we have a fifth generation planned.

Software: Software is deployed at multiple levels.

- Embedded software provides the hooks for us to interface with the keyboard.
- Interfacing software is written in C and provides low level access to the data streams
- Application software is written in Perl and provides the interface for management of the feedback devices.
- Representation and analysis is done in R and generates the graphics that are displayed for the students after they have responded to a question.

Distribution Hardware: If multiple schools are being catered for, then a centralized studio will be required to broadcast content to multiple locations. However, control signals will also need to be broadcast to permit the opportunity for students keyboards to be activated. This process will also require a server in the classroom.

5.7.10. Initial Pilot Program in Maths

In 2010, I decided to conduct a Pilot Program to measure the effectiveness of the process we had defined for improving government schools. As working with government is a complex process we decided to work with the Maria Niketan School in Bangalore which caters to the needs of the economically deprived. The results of that work convinced me that a process of low profile injection for 5 hours a week would be adequate to make government schools the preferred schools for 80% of participating communities. This represents a low profile approach to reform which does not face the inherent resistance of the current system. This resistance is greater in government schools though it is significant also in private schools.

6. Proposed costs and time frame for the project

Expenditure

The principal objective of many of these expenditures is the need for creating a more effective design for the later phases of the rollout culminating in the introduction of this equipment, delivery and incorporation of responses into a centralized database of performance for all government schools in Karnataka.

Total grant sought: 18.535 lakhs.

Rationale for buying rather than hiring

The leasing of electronic equipment is an expensive option. For instance, the daily hire of a projector is about Rs. 1500 per day. For the two sessions required per week for twenty weeks this would amount to Rs. 60,000. The cost of a new projector with higher specifications would be about Rs. 50,000 or less. There is better value in re-selling after the program is over than there is in leasing.

As for the computer laboratory, it is most likely that the school would acquire it. If not these devices can be sold for abut one third of the price. In any event, leasing low cost devices such as Raspberry Pi's is not a viable commercial option.

Fifth Generation Feedback devices

The justification for this is cited in Section 5.6. The cost of this development for 25 units is expected to be of the order of 6 Lakhs, with the objective to design a device that can be manufactured at a cost of USD30 or less. This estimate would include the driver software as well as the application software to the specifications broadly detailed in Section 5.6.

Classroom infrastructure

This will include, in the order of importance:

- One LED projector with IP server: INR 50,000.
- One UPS -1000 VA: INR15,000.
- Two IP cameras recording audio and video acquiring student responses: INR20,000
- Computer laboratory: INR 300,000
- Feedback devices worth INR 300,000 : contributed by self
- Server for feedback devices worth INR 50,000: contributed by self
- Insurance costs estimated at 10% of value of this total: INR 78,500.

Operational expenditure

- HGSE[1] support: INR300,000 - costs of HGSE to measure pre and post program performance of students.
- Cost of additional preparatory materials: INR 240,000
- Support staff salary: INR 200,000
- Exigencies: 50,000
- Topic plans and project materials estimated at INR 500,000 - contributed by self.

Total Expenditure

Category	Total Cost ('000)	Grant sought ('000)	Applicant Contrib. ('000)
Feedback devices - 5th. generation	600.0	600.0	0.0
Classroom infrastructure & Insurance	813.5	463.5	350.0
Operational expenditure less salaries	990.0	490.0	500.0
Salaries	200.0	200.0	0.0
Total	2703.5	1853.5	850.0

6.1. R&D/Design Engg/Consultancy charges

6.1.1. Own share

My share and personal investment has been in developing this project since 1998. Some of those costs have been covered by contributions from various institutions and individuals who believe in the need for improving the education our children get, but the costs of the 4th generation devices have been entirely borne by me. These amounted to about 4 lakhs.

6.1.2. Prism support sought

INR 600,000: We intend to produce 25 units of the fifth generation devices so that they can be ready for deployment in succeeding phases of the Karnataka program. Refer end of Section 4.5

6.1.3. Basis of estimation/justification

Today we are looking at two designs. The second design has a Bill of materials of about USD30.The design and manufacture for this first design will be done by our collaborator in the United Kingdom at their cheapest rate. The second design has a large component of off-the-shelf hardware and the major cost will be in integration and software development. The choice will be arbitrated by unit cost in quantities of tens of thousands, time, complexity, battery life, functionality and software development required.

6.2. Rental charges for laboratory/workshop facilities

No India based laboratories/workshops are expected to be deployed.

[1] Harvard Graduate School of Education

6.2.1. Own share

Nil

6.2.2. PRISM support sought

Nil

6.2.3. Basis of estimation/justification

.N/A

6.3. Essential equipment that cannot be taken on rent

INR 50,000: One LED projector with IP server

Estimate based on Dell M900HD.

INR 15,000: One UPS -1000 VA

Estimate based on APC UPS Model: BR1500G-IN 1.5 KVA

INR 20,000: Recording audio and video for acquiring student responses.

Estimate based on Logitech BCC950 ConferenceCam

INR 300,000: Computer laboratory with 20 stations

Estimate based on a soon to-be-released product or Raspberry Pi with 14in monitors. Open source system visualized using Ubuntu as an operating system.

INR 300,000: Feedback devices worth 3 lakhs: contributed by self

Estimate based on actual prices paid

INR 50,000: Server for feedback devices and transceiver : contributed by self

Estimate: actual costs

6.3.1. Own share

INR 350,000: estimated costs of feedback devices and server

6.3.2. PRISM support sought

INR 385,000: Remaining elements of Section 6.3

6.4. Raw Material/spares/consumables cost

These are not applicable as the hardware development work will be outsourced to organizations we have worked with for many years.

6.5. Fabrication/synthesis charges

These are not applicable as the hardware development work will be outsourced to organizations we have worked with for many years.

6.6. Manpower cost of technical assistants

For the duration of the project, the salary for two technical assistants will be about two lakhs.

6.6.1. Own share

Nil, as I will be contributing my own time and effort to design the topic plans, and doing the principal part of the delivery in the classroom.

6.6.2. PRISM support sought

INR 200,000: Cost of deploying technical assistants

6.6.2.1. Basis of estimation/justification

This estimate is reflective of current rates in Bangalore for the various services envisaged which includes manpower cost of design of materials, assistance with delivery of topic plans etc. It remains however an estimate.

6.7. Testing and Trials

The testing and trials of the 5th generation devices will be conducted during the school program while testing and trial of topic plans will be conducted using existing 4th generation devices.

6.7.1. Own cost

500,000: Topic plans and project materials estimate.

6.7.2. PRISM support sought

6.7.2.1. Operational expenditure

INR 240,000: Cost of preparatory materials
INR 50,000: Exigencies
INR 78,500: Insurance for all equipment in use (Applicant and PRISM grant)
INR 300,000: HGSE or equivalent support

6.8. Travel

A return trip for travel to the United Kingdom or Taiwan/China may be required though that is not necessarily certain. Hence, it has not been accounted for here. We expect to use video conferencing for any such requirement unless it becomes absolutely necessary in which case we would ask for permission to cross subsidize from other headers for this project. Some expenses will be required for travel to Chandigarh to attend TOCIC meetings.

6.9. Patent Filing

We do not expect to file a patent for this work at this stage.

6.10. Total cost

The total cost is 27.03 lakhs

Own share

8.5 lakhs

PRISM support sought

18.53 lakhs

7. Activity details/work plan

The following plan is based on the assumption that funding for the first stage is received by 1 October, 2014.

7.1. Design engineering (for product innovation)/ Research and Development/consultancy (for processes innovation)

7.1.1. Monitorable milestones

7.1.1.1. Design engineering

4 November 2014: Statement of functional specifications for 5th generation feedback devices.

5 Jan. 2015: Decision on design approach i.e. new hardware design or off-the-shelf integration option.

7.1.1.2. Research/Development/Consultancy

7 October 2014: Consultancy negotiations with HGSE or similar organization for independent Pre and Post testing of student group

3 November 2014: Design of topic plans, setting up of computer laboratory and setting up classroom space.

7.1.2. Duration

3 months

7.1.3. Budget required from Prism

INR 200,000: One third cost of 5th generation feedback device development

INR 50,000: One LED projector with IP server

INR 15,000: One UPS -1000 VA

INR 20,000: Recording audio and video for acquiring student responses.

INR 70,000: Half cost of preparatory materials for topic plans.

INR 300,000: Computer laboratory with 20 stations

INR 78,500: Insurance costs estimated at 10% of value

7.1.3.1. Total Sum required

INR 603,500: Total sum for this header

7.2. Working mode/prototype development or Lab scale process development

7.2.1. Monitorable milestones

7.2.1.1. Prototype development

1 March 2015: Working model of 5th generation feedback device.

1 August 2015: 25 working models of 5th generation, feedback devices ready

7.2.1.2. Lab scale process development

3 November 2014: Commencement of Pre-tests for Maths, English and Systems thinking.

10 November 2014: Independent Pre tests (HGSE) of student ability

7.2.2. Duration

9 months - 3 Nov., 2014 to 1 Aug., 2015

7.2.3. Budget required

INR 200,000: One third cost of 5th generation feedback device development

INR 150,000: Half cost of Pre-test/Post-Test by Independent assessor (HGSE or equivalent)

INR 100,000: Half cost of supporting staff

INR 25,000: Half budget for exigencies

INR 70,000: Second half cost of preparatory materials for topic plans.

7.2.3.1. Total Sum required

INR 545,000: Total sum for this header

7.3. Product testing/process demonstration

10 November 2014: Commencement of 100 hours of instruction in English, Maths and Systems Thinking.

1 August 2015: First version of application software for 5th generation feedback devices

1 September 2015: Commencement of 5th generation feedback devices testing for about 20 hours of classroom usage.

6 October 2015: Final tweaking of application software.

7.3.1. Duration

9 months -10 November 2014 to 6 October 2015

7.3.2. Budget required

INR 200,000: One third cost of 5th generation feedback device development
INR 150,000: Half cost of Pre-test/Post-Test by Independent assessor (HGSE or equivalent)
INR 100,000: Second half cost of supporting staff
INR 25,000: Second half budget for exigencies

7.3.2.1. Total Sum required

INR 545,000: Total sum for this header

7.4. Others

15 December 2015: Final report of Pilot Project available
15 January 2016: First iteration of hardware, software and application software finalized and tested.

7.4.1. Duration

1 month

7.4.2. Budget

Nil

8. (a) End product / process / output-resulting from the idea/ invention/ innovation / final deliverables (Including targeted specifications, performance requirements/standards) (b) Innovation's benefit to the society

8.1. End product / process / output-resulting from the idea/ invention/ innovation / final deliverables

The end product resulting from this initiative is a system of education for government schools that will make participating government schools the preferred schools in urban communities.

The specific objectives, initial and final deliverables are indicated below in an extract from the presentation to the Hon'ble Minister Primary and Secondary Education, Govt. of Karnataka.

One answer to this question lies under the Section "Innovations components" on Page 4.

A more specific definition of the outputs resulting from the idea are indicated below:

8.2. Innovation's benefit to society

- This question is best answered by the specific presentation to the Minister, Primary and Secondary Education, Govt. of Karnataka which is embedded here
- This presentation defines what we want from the Govt. of Karnataka, and illustrates the factors that dictate the need for change. We show in that presentation why the Govt. needs to support AGEM and summarize the issues involved.
- It is important that this presentation is reviewed using Adobe Reader so that the attachments and links can be accessed.

8. (a) End product / process / output-resulting from the idea/ invention/ innovation / final deliverables (Including targ

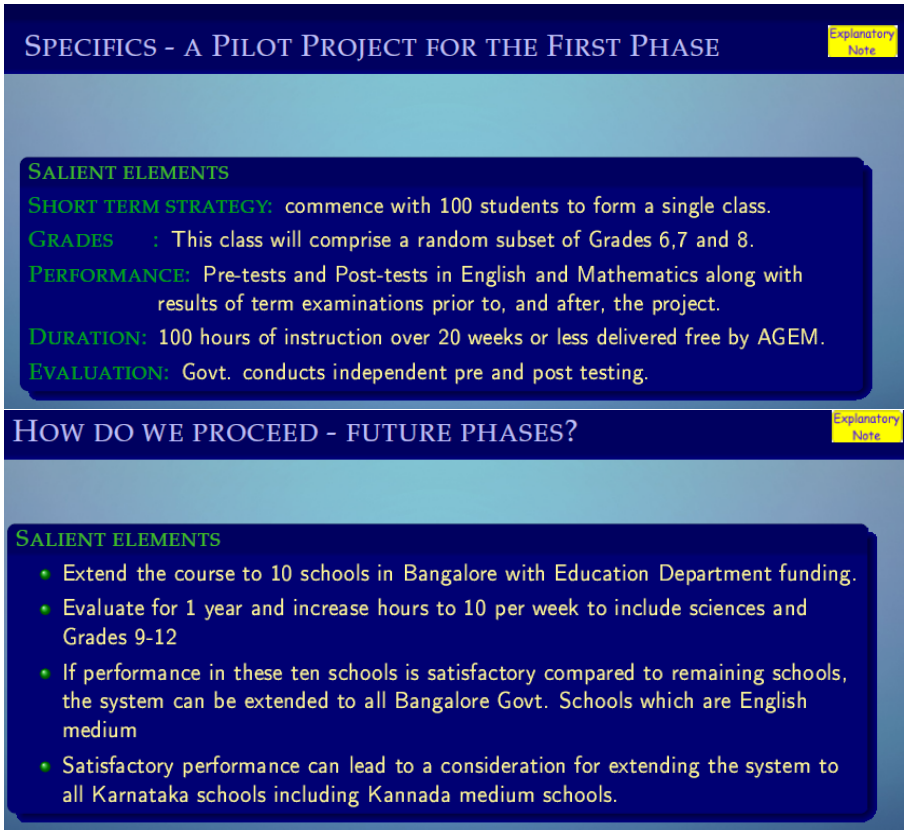


Figure 8.1.: Scope and sequence of the AGEM project

9. Any other information related to the project

This project is supported by the Hon'ble Minister for Primary and Secondary Education and by the Director, Department of State Education Research and Training as indicated by the letter from Director, DSERT in Appendix A

The process which will permit the project to go to any succeeding phase is expressed in Figure 8.1

I would like to stress that almost all sessions of earlier teaching have been video recorded and are available for review. There have been instances where sections of video are missing in some of the recordings due to some problems but we have over 20 hours of recording which can be made available for review.

10. Referees (Two Nos with complete address, phone number and email ID)

10.1. Referee - Prof. Pratap Mohapatra

Prof. Mohapatra is a distinguished name in the field of System Dynamics and the former Dean of Postgraduate Students and Research at IIT, Kharagpur. We have worked together on a program for developing a Systems Dynamics mathematical model for Bangalore's solid waste management system.

Designation: Professor, Department of Industrial & Systems Engineering, IIT Kharagpur,

Address: Department of Industrial & Systems Engineering, IIT Kharagpur, Kharagpur 721 302, WB.

Email: pratap@hijli.iitkgp.ernet.in AND pratap_moha@yahoo.co.in

Tel: 03222 283738 (O), 03222 383739 (R), 094340 20437 (C).

10.2. Referee - Mr. Karthik Ayyar

Mr Karthik Aiyyar is an outstanding individual with considerable skills in software and hardware design and was responsible for the design of our second generation wireless feedback devices. He works gratis on many projects for the Tamil Nadu police and IIT Madras with a view to creating a more just and equitable society in India.

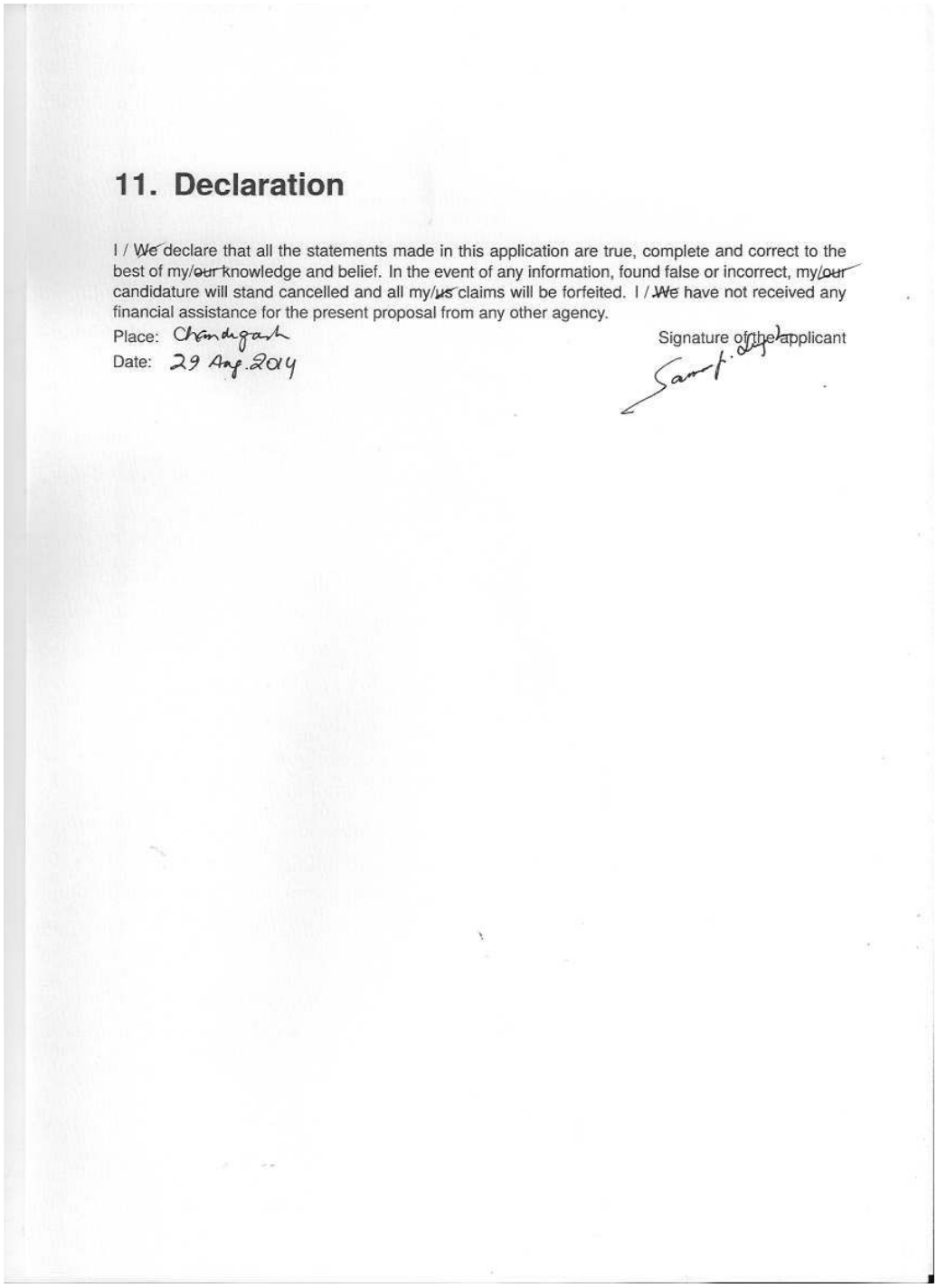
Designation: Founder Director, Enmail.com

Address: 59 Oliver Road, Mylapore, Chennai - 600 004, INDIA

Email: karthik.ayyar@enmail.com

Tel: +91 99 41 99 62 64

11. Declaration



11. Declaration

I / ~~We~~ declare that all the statements made in this application are true, complete and correct to the best of my/~~our~~ knowledge and belief. In the event of any information, found false or incorrect, my/~~our~~ candidature will stand cancelled and all my/~~us~~ claims will be forfeited. I / ~~We~~ have not received any financial assistance for the present proposal from any other agency.

Place: Chandigarh

Date: 29 Aug. 2014

Signature of the ~~applicant~~

12. RECOMMENDATIONS OF THE FORWARDING TePP Outreach Cum Cluster Innovation Centre (TOCIC)

Place: Signature of the Head, TOCIC

Date:

A. Letter from Department of State Education Research and Training.

ಕರ್ನಾಟಕ ಸರ್ಕಾರ
Government of Karnataka
ರಾಜ್ಯ ಶಿಕ್ಷಣ ಸಂಶೋಧನೆ ಮತ್ತು ತರಬೇತಿ ಇಲಾಖೆ
ಡಿ.ಎಸ್.ಇ.ಆರ್.ಟಿ DEPARTMENT OF STATE EDUCATIONAL RESEARCH AND TRAINING
DSERT NO 4, 100 FT RING ROAD, BANASHANKARI 3RD STAGE BENGALURU - 085
E MAIL:dsertkar@gmail.com , Website: http://dsert.kar.nic.in
Phone : 080 26422372 26422373 26422374
Fax:26422377

ಸಂಖ್ಯೆ: ರಾ.ವಿ.ಸಂ(2)/ ವಿ.ಕಾ/ಇತರೆ/06/13-14 ದಿನಾಂಕ: 21.08.2014

ಉಪನಿರ್ದೇಶಕರು (ಆ),
ಬೆಂಗಳೂರು ಉತ್ತರ ಜಿಲ್ಲೆ
ಬೆಂಗಳೂರು .

ವಿಷಯ: AGEM Pilot Project ಗೆ ಅನುಮತಿ ನೀಡುವ ಕುರಿತು.
ಉಲ್ಲೇಖ: 1) ಮಾನ್ಯ ಶಿಕ್ಷಣ ಸಚಿವರು (ಪ್ರಾಥಮಿಕ & ಪ್ರೌಢಶಿಕ್ಷಣ) ರವರ ಆದೇಶ ಸಂಖ್ಯೆ: ಪ್ರಾ& ಪ್ರೌ.ಶಿ.ಸ/3842/2014 ದಿನಾಂಕ:15.07.14
2) ಡಾ॥ ಸಮರ್ ಸಿಂಗ್ ಪಿ.ಎಚ್.ಡಿ ರವರ ಪ್ರಸ್ತಾವನೆ ದಿನಾಂಕ :18.07.2014

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ಮೇಲ್ಕಂಡ ವಿಷಯಕ್ಕೆ ಸಂಬಂಧಿಸಿದಂತೆ , ಈಗಾಗಲೇ ಚಾಲ್ತಿಯಲ್ಲಿರುವ ತರಗತಿಯ ಬೋಧನಾ-ಕಲಿಕಾ ವಿಧಾನಕ್ಕೆ ಪೂರಕವಾಗಿ ಗಣಿತ , ವಿಜ್ಞಾನ ಹಾಗೂ ಆಲೋಚನಾ ಕ್ರಮಗಳಿಗೆ ಸಂಬಂಧಿಸಿದಂತೆ AGEM Approach Pilot Project ಕೈಗೊಳ್ಳಲು ಉದ್ದೇಶಿಸಿರುತ್ತಾರೆ.

ಈ ಕಾರ್ಯಕ್ರಮದ ಸಂಬಂಧ ರಾಮ್‌ನಾರಾಯಣ್ ಸರ್ಕಾರಿ ಮಾದರಿ ಪ್ರಾಥಮಿಕ ಶಾಲೆ ಆರ್.ಎಂ.ವಿ. 2 ನೇ ಹಂತ, ಉತ್ತರ ವಲಯ-2, ಬೆಂಗಳೂರು ಉತ್ತರ ಜಿಲ್ಲೆ, ಇಲ್ಲಿನ 6, 7 ಮತ್ತು 8 ನೇ ತರಗತಿಯ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಒಂದು ವಾರದಲ್ಲಿ 4-5 ಅವಧಿಯಂತೆ ಒಟ್ಟು 100 ಅವಧಿಗಳಲ್ಲಿ ಬೋಧನಾ – ಕಲಿಕೆಯ Pilot Project ಹಾಗೂ ಶಿಕ್ಷಕರಿಗೆ ಪೂರ್ವಭಾವಿಯಾಗಿ orientation ಕಾರ್ಯಕ್ರಮವನ್ನು ನೀಡಲು ಉದ್ದೇಶಿಸಿರುತ್ತಾರೆ. ಸದರಿ ಕಾರ್ಯಕ್ರಮವನ್ನು ಸಂಬಂಧಿಸಿದ ಶಾಲೆಯ ಮುಖ್ಯಶಿಕ್ಷಕರು , ಎಸ್.ಡಿ.ಎಂ.ಸಿ. ರವರ ಒಪ್ಪಿಗೆಯನ್ನು ಪಡೆದು ಅನುಷ್ಠಾನಗೊಳಿಸಲು ಕ್ರಮವಹಿಸುವುದು.

ಷರತ್ತುಗಳು:

1) ಸದರಿ ಪ್ರಾಜೆಕ್ಟ್ ನ್ನು ಶಾಲಾ ಬೋಧನಾ ಪ್ರಕ್ರಿಯೆಗೆ ತೊಂದರೆಯಾಗದಂತೆ , ಶಾಲಾವಧಿಯನ್ನು ಹೊಂದಿಸಿಕೊಂಡು ಕೈಗೊಳ್ಳುವುದು.
2) ಪ್ರಾಜೆಕ್ಟ್ ನ ಅನುಷ್ಠಾನದ ಅವಧಿಯಲ್ಲಿ ಕಡ್ಡಾಯವಾಗಿ ಶಾಲಾ ಮುಖ್ಯಶಿಕ್ಷಕರು/ಸಹಶಿಕ್ಷಕರು ಹಾಜರಿದ್ದು ಅಗತ್ಯ ಸಹಕಾರ ನೀಡಿ ಮಕ್ಕಳ ಸುರಕ್ಷತೆಗೆ ಗಮನ ಹರಿಸುವುದು.

ನಿರ್ದೇಶಕರು
ಡಿ.ಎಸ್.ಇ.ಆರ್.ಟಿ.,ಬೆಂಗಳೂರು

ಪ್ರತಿ:

1) ಪ್ರಾಂಶುಪಾಲರು ಬೆಂಗಳೂರು ನಗರ ಡಯಟ್ – ಕಾರ್ಯಕ್ರಮದ ಪ್ರಗತಿಯ ವರದಿ ನೀಡುವ ಅಗತ್ಯ ಕ್ರಮಕ್ಕೆ
2) ಡಾ॥ ಸಮರ್ ಸಿಂಗ್, AGEM Pilot Project ಗೆ ಅಗತ್ಯ ಕ್ರಮಕ್ಕೆ

B. Informal translation of the letter from Director, DSERT

Government of Karnataka

Department of State Educational Research and Training

No. R.V. (2)/V.K/Misc/06/13-14 Dated 21.08.2014

From
Deputy Director (Administration)
Bengaluru North District
Bengaluru

Subject: Regarding permission for AGEM Pilot Project
Reference: 1) Honourable Education Minister (Primary & Higher Education) Order no. PPS/3842/2014 dated 15.07.14
2) Proposal by Dr. Samar Singh, PhD dated 18.07.2014

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With reference to the above subject, it has been decided to take up the AGEM Approach Pilot Project for the present academic year complementing the current Mathematics and Science syllabus.

It is proposed to have hundred hours of classes at the rate of 4-5 classes per week for the students of 6th, 7th and 8th standards of Ramanarayan Government Model Primary School, R.M.V. II Stage, North Zone - 2, Bengaluru North District. It is also proposed to have an orientation programme for the teachers. Permission regarding this will be taken from the school headmaster and SDMC.
Conditions:
1) The above project may be taken up on the condition that the routine of the school is not disrupted and is within the school hours.
2) It is compulsory that the headmaster and the teachers be present, cooperate and ensure safety of the children while the project is being implemented.

Signed
Director, DSERT, Bengaluru