Can open ICT4D shape future of rural education?
Innovations in Sri Lanka Telecenters

Niranjan <u>Meegammana</u>
Project Director, Shilpa Sayura Foundation, 131, Dawulagala Rd.
Pilimatalawa, Sri Lanka, niranjan@info.lk

Rev. <u>Keeragolle</u> Dhammasara
Manager , Talakumabura Nenasala, Sri Lanka, dhammasarahimi@gmail.com

<u>Velayudan</u> Murali Khrishna
Manager, Haldummulla Nenasala, Haldumulla, Sri Lanka, murali@info.lk

Rasika <u>Sampath</u>
M & E Executive, e fusion (pvt) Limited, 57, Wanatha Rd,
Gangodawila, Nugegoda, Sri Lanka, rasikabin@gmail.com

Abstract

150 Rural Telecenters of Sri Lanka and Shilpa Sayura E Learning Project have innovated rural education development by catalyzing of the power of ICT to increase the access to National Education in local languages by developing of an ICT powered open e learning platform to transform hierarchical learning at schools to open learning at Telecenters, thereby found an alternative and globally replicable solution to rural educational problems, seen as a up-scalable social education model and an example in open ICT4D to shape future societies.

This research studies Shilpa Sayura approaches to foster openness in rural education, methods, challenges, adaptations, impact, needs and future using four "Open learning" case studies to improve the understanding to inspire a discussion on "Open learning at Telecenters in the context of open ICT4D" to develop education in local language for rural societies on an open ICT4D platform.

In conclusion, Nenasala & Shilpa Sayura combination demonstrates that ICT significantly catalyzes the development of networked learning societies. Openness and participation are important factors for ICT4D success. "Open learning at Telecenters" is an innovative approach replicable locally and globally to transform rural societies of the developing word. Hence emphasize investment, research and development in this area to help shaping education in future societies.

Keywords: open learning, open ICT4D, Shilpa Sayura, Nenasala, Telecenter/Telecentre, Learning Society, Knowledge Network, Knowledge society, rural communities, rural development, open development, social innovation, and research

Table of Contents

1.0 Introduction

150 Nenasala Telecenters in Sri Lanka and Shilpa Sayura local language e learning project have invented a new way to teach people by catalyzing the power of ICT4D. Shilpa Sayura by delivering essential knowledge and in local languages to the door step of rural societies transformed Telecenters to e schools to improve examination results of rural youth, created higher education and employment opportunities and addressed early school drop off problem.

Shilpa Sayura and Nenasala are both are open ICT4D projects powered by collaborative partnerships of public, private and community. Shilpa Sayura is seen as an insight of a new social educational model for developing rural education societies for inclusion in learning society.

Shilpa Sayura addressing rural educational problems developed an ICT powered local language e learning system to promote self learning of National curriculum at Telecenters. The experimental Shilpa Sayura pilot implemented in 20 Nenasala Telecenters, now replicated in 150 Telecenters and established an open learning network among rural societies. The openness, inclusiveness, participatory and a collaborative initiative is seen as an example of open ICT4D to shape future societies.

1.1 Nenasala Telecenter Network

Nenasala is a community owned heterogeneous Telecenter network in Sri Lanka, setup by government under e Sri Lanka project in a 1000 Telecenter rollout plan. Total of 600 Telecenters have been setup around the island using a World Bank loan. Nenesala are aimed to reduce digital divide, develop culture and commerce and promote community integration.

In Uva Province Telecenter Network, there are four main types of Nenasala Telecenters by ownership

No	Model	Owned by	Percentage
1	Temple Model	Chief priest of the village temple	47%
2	CBO model	Community based organizations	18%
3	NGO Model	Non Profit Organizations	15%
4	Private Model	Private Individuals	20%

Most private owned Telecenters located in urban settings are focused on market based ICT services which help better financial performance. The Temple, CBO and NGO owned Telecenters located in rural locations are more focused on social purposes and earn less revenue.

"Nenasala are quite common in infrastructure but unique by location, served community, leadership and skills. "(Impact Monitoring & Evaluation for Developing of Sustainable Tele Center Networks. Niranjan Meegammana, and Rasika Sampath Sri Lanka Telecenter Community, 2009)

A typical Nenasala Telecenter has 3 PCs, a printer, webcam, broadband internet connection. Still there are ones with 2 computers. 80% of Nenasala have internet access and mainly provide ICT literacy training, internet and less mobile communication services. Nenasala has been a mainly useful to young students and there is also a trend of adults using Nenasala for communication and agriculture information. In average a Nenasala serves 100 users, but most rural ones serve 30-40 users and most of the staff is volunteers. Nenasala Telecenters have received support from the government through various programs i.e. e-SDI, EVS, RIT--; which have helped improvement of their sustainability.

Nenasala Telecenters have helped in creation of an ICT literate young community who would re-shape future of rural societies. Currently most Nenasala Telecenters anticipate some external support for connectivity, technical assistance and resources to enhance their social sustainability to achieve future financial sustainability. Nenasala Telecenters are interdependent by design and implementation and a member of a single network guided by the government, assisted by private and non-profit sectors, seems to be an example of an emerging open ICT4D network.

1.2 Shilpa Sayura Project

Shilpa Sayura is a local language e learning project which implements self e learning at Nenasala Telecenters to study National curriculum which helped creation of new social model of education for youth in rural societies who are challenged with unavailability of teachers and educational resources. Shilpa Sayura was initiated by e fusion private ltd. with the partnership assistance of Information and communication Technology Agency (ICTA) e-Society Development Initiative (e-SDI).

The vision of Shilpa Sayura is "to empower rural students with ICT based educational systems to improve self learning capacity while enhancing the Nenasala utilization through participative development". (Shilpa Sayura – Localized Self and Group e-Learning System for Handicapped Students in Remote, Rural communities of Sri Lanka, Niranjan Meegammana, 2006).

Shilpa Sayura platform consists of an e learning application and content for secondary education covering Math, Science, English, Sinhala, Tamil, ICT,

History, Art, Dance, and Music in local Language. The content in Shilpa Sayura produced with the assistance of volunteer teachers and developers. The software and content provided free of charge to Telecenters. As the system is hosted locally, require no connectivity and runs on desktops, laptops, OLPC, IP Networks. Shilpa Sayura introduces open learning and build capacity of Telecenters to improve their sustainability.

Shilpa Sayura pilot project implemented in 20 Nenasala centers in 2006; replicated in 50 Telecenters in 2008 and now serves more than 9000 students at 150 Telecenters. The project has won seven international awards of I4D 2007 in India, Stockholm Challenge GKP 2007 in Malaysia, Stockholm Challenge 2008 in Sweden, Diskobolos 2008 in Belgrade, World Youth Summit Awards 2009 in Mexico and Lien I3 Challenge 2009 in Singapore. The Ceylon Chamber of Commerce CSR Award makes Shilpa Sayura a Social Enterprise.

1.3 The general context of education in Sri Lanka

The Constitution of Sri Lanka states that education as a fundamental right and Sri Lanka's population has a literacy rate of 92%, the highest literacy rate in South Asia and overall, one of the highest literacy rates in Asia.

The structure of education is divided into five parts of primary, junior secondary, senior secondary, college and university. it is compulsory that all children go to school till grade 9 (age 14). Students who wish to pursue tertiary education must pass the General Certificate of Education (GCE) Ordinary Level in order to enter the Advanced Level and study for another 2 years (grades 12-13) before university entrance exams. Due to the variety of ethnic groups in Sri Lanka, many schools teach only in either Sinhala medium or in Tamil medium. Few schools teach in all three medium.

Most of the schools in Sri Lanka are maintained by the government as a part of the free education by allocating 2.6% of National budget compared to India 4.1% and Malaysia 8.1%.   With the establishment if the provincial council system in the 1980s, the central government handed control of 9506 schools to the provincial governments and 323 schools retained by the central government as National schools.

1.3.1 The historical development of education in Sri Lanka

Education in Sri Lanka dates back to 300 BC with the early education system evolved around the Buddhist temples. The Western education became core of the Sri Lankan society during colonial rule after 17th Century. The first schools were setup by churches and a standard system of schools was started by the British on the recommendations of the Colebrooke Commission in 1836.

The late Hon. Dr.C.W.W. Kannangara, commonly referred to as the Father of Free Education in Sri Lanka, as the Minister of Education in the State Council introduced extensive reforms to the education system establishing Madhya Maha Vidyalayas (Central Colleges) in rural parts of the country and major policy decision was made in 1942 to make education available free of charge, and make national languages Sinhala and Tamil the media of instruction.

2.0 Aim of this paper

In the recent working paper on open ICT4D, (Matthew Smith, Nathan J Engler, Gideon Christian, Kathleen Diga, Ahmed Rashid and Kathleen Flynn-Dapaah, IDRC, 2009) suggests that open ICT4D as a Hypothesis.

The aim of this paper is to enhance the understanding of open ICT4D in with reference to research on Shilpa Sayura and Nenasala Telecenter Network

combination in Sri Lanka; and intends to inspire a learned discussion on "Open learning at Telecenters in the context of open ICT4D" to construct new knowledge of the significance of openness in ICT4D in creating of an improved and networked society taking Shilpa Sayura as an example to suggest that "Open learning at Telecenters can help shaping of the future societies".

3.0 Previous studies

Open learning is supposed to allow pupils self-determined, independent and interest-guided learning.
http://en.wikipedia.org/wiki/Open_learning, retrieved on 15th Nov 2008

Open education is a collective term that refers to forms of education in which knowledge, ideas or important aspects of teaching methodology or infrastructure are shared freely over the internet.
http://en.wikipedia.org/wiki/Open_education, retrieved on 15th Nov 2008

In Sri Lanka the Shilpa Sayura project has provided content in local languages which is extensively used and appreciated. (Critical Issues for e-Learning Telecentres in Sri Lanka and India, Gaiani, S., Hansson, H., Meegammana, N., Mozelius. P., M-2009)

Significant contribution of Telecenters can also be seen in including the rural people in the knowledge economy both directly and indirectly. (Critical Issues for e-Learning Telecenters in Sri Lanka and India, Gaiani, S., Hansson, H., Meegammana, N., Mozelius, P., M-2009)

Therefore the need of the hour is to find an alternative path to get a tertiary qualification; this could be done only through the use of Distance Mode. Today, Sri Lanka, at this given point in time, has to ensure a more efficient use of public resources to open more opportunities for higher education. (Warnapala, 2009, p 80)

The Telecentre initiatives in Sri Lanka can be seen as a modern follow up to the successful Free Education Scheme introduced in 1944 in Sri Lanka (Warnapala, 2009).

Self learning "... in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes." (Knowles 1975: 18)

Technology can facilitate learning by providing real world contexts that engage learners in solving complex problems (Duffy & Cunningham, 1996; Honebein, 1996; & Cognition and Technology Group at Vanderbilt, 1992).

This emerging open education movement combines the established tradition of sharing good ideas with fellow educators and the collaborative, interactive culture of the Internet. It is built on the belief that everyone should have the freedom to use, customize, improve and redistribute educational resources without constraint. Educators, learners and others who share this belief are gathering together as part of a worldwide effort to make education both more accessible and more effective. (Cape Town open Education Declaration, 2008)

"The existing configuration of property regimes and organizational forms that produce, disseminate and maintain certain goods are essential components of the social environment that determine the relative openness of a particular good. (Open ICT4D, 2009)

Openness is not a binary concept, it is scalar; content is neither open nor closed, rather it ranges from highly open to highly closed depending upon who makes it, who accesses or uses it, and how it is owned. (Open ICT4D, Matthew Smith, Nathan J Engler, Gideon Christian, Kathleen Diga, Ahmed Rashid and Kathleen Flynn-Dapaah, IDRC, 2009)

ICT4D 2.0 designs around the specific resources, capacities and demands of the poor. Or, we can transform "the network is the platform" to argue that while ICT4D 1.0 saw ICTs as a tool for development, the second phase sees ICTs as the platform for development (ICT4D 2.0, Richard Heeks, 2009)

4.0 Methodology

The methodology used in this paper is to be classified as case study research (Benbasat et al. 1987, Yin 1994). The information was collected during 3 years of Shilpa Sayura project and 17 months M & E Assignment on Uva province Telecenters involving interviews, structured questioners, informal discussions and observations. Nenasala operators, students, parents, teachers, E fusion developers and ICTA officials participated in this research.

The four case studies aimed at finding out how ICT catalyzed the open learning? What challenges, adaptations, innovations and impact resulted and what lessons were learned to discuss approaches of Shilpa Sayura to foster "openness" to ensure motivation, inclusion, collaboration, participation and creating new forms of partnerships for increasing sustainability, further discuss openness in ICT4D and examines how this experimental education model could be replicated locally and globally? What prerequisites, policy and other needs to be satisfied to create an inspiring future educational model for

shaping education in future societies?

Case	Data collection methods	Field studies by	Year
Open learning success of five priests of Talakumbura	Interviews, Observations, Questionnaires	Niranjan Meegammana, Rasika Sampath, Keeriyagolle Dhammasara	2009
Hingurukaduwa self learning e Village	Interviews, Observations, Questionnaires	Niranjan Meegammana, Rasika Sampath	2009
Education from Nagala Telecenter to excluded students	Interviews, Observations, Questionnaires	Niranjan Meegammana, Rasika Sampath	2009
Siyambalanduwa e School access to education for all	Interviews, Observations, Questionnaires	Niranjan Meegammana, Rasika Sampath	2009

5.0 Research Findings

5.1 Rural Education issues in Sri Lanka

Rural education issues in Sri Lanka are multi dimensional and linked to inadequate and unbalanced resource distribution and poverty hence requires understating of rural education system comparing to National education. Following section compares prime research location Uva province with national education to enhance the knowledge on problem and ICT4D environment.

5.1.1 Schools and Student Distribution in Sri Lanka

Based on government statistics of 2006, the number of public schools has increased to 9829, and number of students has increased to 4,179,217 students. There are also 561 Pirivena (Schools for Buddhist priests) and 80 private schools with constitute 152142 students (2.4%). Among 9829 schools of Sri Lanka 7425 schools (75.5%) have less than 1000 students each, 2735 schools (27.8%) has less than 500 students.

Number of Students	Schools
1-5	1363
51-100	1338
101-200	1989
201-500	2735

501-1000	1429
1001-1500	506
1501-2000	206
2001-2500	114
2501-3000	72
3001-3500	30
Above 3500	47

9829

Source: Statistics Department Sri Lanka

Among them the students of 4225 schools (42.9%) facilitating junior secondary education of grade 1 to 11 and students of 3276 schools (33%) facilitating up to only grade 1 to 8 in junior secondary education, means at least 75.9% percent of schools are in rural areas concerned in this research. The median size of a school is 200 students, i.e. exactly half of the schools in the country have less than 200 students. According to statistics number of small schools has been on the increase in the recent years. 1,549 schools (16.0%) have less than 51 students in 2006 compared to 12.4% schools in 1997.

In Uva province 767 of the schools (92.2%) are in rural areas and 660 of them (79.4%) are most rural communities with less than 500 students.

Schools Distribution

Province	Schools
Uva	829
Western	1393
Southern	1151
Northern	368
Eastern	937
North Western	1250
Noth Central	783
Central	1483
Sabaragamuwa	1135

Source: Statistics Department Sri Lanka

5.1.2 Secondary Education Examination Results

Based on government statistics, among 296358 students sat for General Certificate Examination (GCE) Ordinary Level (O/L) in 2006, only 48.70% qualified for GCE Advanced Level (A/L). 8.44% had failed in all subjects. In Uva province only 39.98% qualified for GCE A/L and 12.37% had failed in all subjects.

5.1.2.1 Uva Province GCE O/L Examination Results

Examination results of Uva Province were below National average and 3 of case locations were in worst performing education divisions of Uva province. 11012 students failing GCE O/L are possibly become dropouts.

Division	Sat	Qualified for A/L	Percentage qualified	Failed in all subjects %
Badulla	3558	1662	46.71	8.97

Bandarawela	2938	1542	52.48	5.57
Mahiyanganaya	1903	702	36.89	15.16
Welimada	2416	989	40.94	9.39
Passara	1007	350	34.76	9.42
Monaragala	2207	813	36.84	17.19
Wellawaya	3149	1170	37.15	17.15
Bibile	1611	549	34.08	16.07
Total	**18789**	**7777**	**39.98**	**12.36**

Source: Statistics Department Sri Lanka

5.1.2.2 Subject wise results of GCE. O/L examination

Subject wise In 2006 42.63% passed in math, 48.35% in Science, 36.82% in English, 54.4% in Art, 73.49% in Agriculture, Tamil Literature 57.15%. The overall fail rate was 51.3%. Overall 57.37% failed in Math, 51.65% failed in Science while 63.2% failed in English. The failure rates in educational zones of Wilgamuwa was 73.3%, Teldeniya 63.7%, Walapane 74.2%, Bibile 66% and Dimbulagala 69.7% compared to failure rates of 27%-35% in cities.

2006 O/L	Sat	Passed	Failed
English Language	258975	36.82	63.18
Mathematics	259265	42.63	57.37
Social Studies & History	259096	75.48	24.52
Science & Technology	258948	48.35	51.65
Sinhala Language & Lit.	210198	79.19	20.81
Buddhism	193585	82.25	17.75
Art	109763	54.45	45.55
Agriculture	96671	73.49	26.51
Business Accounting	78882	81.44	18.56
Geography	73383	60.64	39.36
History	72905	56.62	43.38
Sinhala Literature	62064	62.79	37.21
Home Economics	54173	73.44	26.56
Dancing (S)	52091	83.07	16.93
Music (S)	50158	63.56	36.44
Tamil language & Lit.	49748	83.4	16.6
Tamil Literature	31140	57.15	42.85

*Source: Statistics Department Sri Lanka*

5.1.2.3 Distribution of students by grades

Following table is an indication of the possible school drop off pattern in secondary stage.

2002 Students in grades		
Grade	Students	Percentage
Grade 1	326915	8.12
Grade 2	333077	8.27
Grade 3	337816	8.39
Grade 4	350433	8.70
Grade 5	376052	9.34

Grade 6	355310	8.82
Grade 7	328778	8.16
Grade 8	327599	8.13
Grade 9	306548	7.61
Grade 10	291643	7.24
Grade 11	270083	6.71
Grade 11 Repeat	99562	2.47
Grade 12	118400	2.94
Grade 13	128957	3.20
Grade 13 Repeat	71181	1.77
Special Education	4721	0.12
	4027075	

Source: Statistics Department Sri Lanka

2002 Students and Grades Chart show that number of students declining start in Grade 5 and become a sharp at GCE O/L examination. This is considered as a major issue in current education system where secondry school drop offs adds unemployed youth who are the focus Shilpa Sayura and this research.
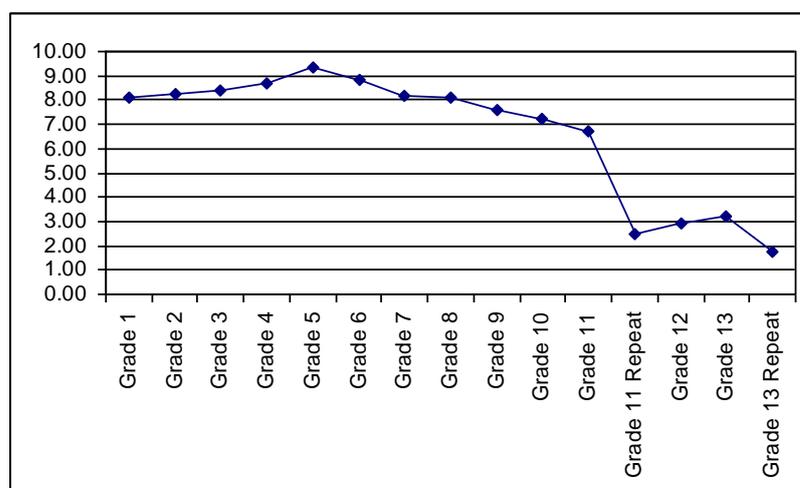
5.1.2.4 The competition to enter Universities

Due to inadequate space in 16 state universities in Sri Lanka for the 20 million people, the GCE A/L examination competition is high. Although 50.52% of students become eligible to enter university, only 16.5% are admitted. Many students seek higher education by traveling to distant locations for tuition for external degrees. Students in Thanamalwila travel more than 100km to Matara and students for private tuition for external degrees.

5.1.2.5 The disadvantage of rural students

Most of the students studying in rural communities are disadvantaged in National Examinations as they lack necessary education resources. They miss school having to assist agriculture work of parents and look after younger members of the family when parents work in the fields; hence unable to cover lessons adequately to prepare for National examinations. This growing problem has resulted large number of examination failures and

school dropouts from rural areas, who become unemployed and deprived of opportunities to improve well being of life.

5.2 Case Studies

The following four open learning case studies help understanding of local adaptations of Shilpa Sayura by Telecenters, to include excluded groups in rural societies creating a networked open ICT4D platform. (Figure 1.0 & 2.0)

5.2.1 Open learning success of five priests of Talakumbura

Thalakumbura Nenasala, lead by Rev. Keeriyagolle Dhammasara, helped five young priests to pass National examination without attending a formal school. Among them, Rev. Babaragalapathane Gnanaseela became a junior priest at the age of 9 and studied in temple; Temple curriculum included Math, Science, and Sinhala, but not in depth as National curriculum taught in schools. Determined to pass National examination, the five young priests used Shilpa Sayura to improve their knowledge. They learned History subject totally from Shilpa Sayura and the self testing engine helped them to prepare for GCE O/L examination.

Impact of open learning

Shilpa Sayura and Nenasala created an open learning environment for five priests self learn as a group and pass of GCE O/L examination to enter advanced level. Now more young priests are using Shilpa Sayura at Nenasala with increased confidence in passing National Examinations.

Challenges

Demand created by students for inclusion of new subjects, in depth content, enhanced instructions and required more e learning time. Three computers in Thalakumbura Nenasala were not enough to serve more than 100 users.

Lessons Learned

ICT catalyzed open learning at Telecenters helping inclusion of rural youth in education for all. Delivering knowledge on demand enables freedom of learning. And self learning at Telecenters is a new social educational model for rural development.

Future
Shilpa Sayura need to increase subjects, improve instructions and content to enhance self learning at Telecenters. Telecenters need capacity building to facilitate e learning.

5.2.2 Hingurukaduwa self learning e Village

Hingurukaduwa Nenasala, lead by Janaka Srimal, created an e learning village establishing 20 self learning groups using Shilpa Sayura and shared computers housed in homes which helped improving knowledge of the students resulting better examination results. Telecenter provided computers, training and technical services free of charge and obtained donor assistance for procurement of computers and for maintaining the Telecenter. The students were given ICT and English training at Telecenter; and two more remote branches were setup by to expand Telecenter service. Hingurukaduwa e learning groups have formed a knowledge network without cables. This change in their community was enabled by ICT and increased rural youth access to National education.

Impact of open learning
Open learning helped excluded youth to find an alternative way for learning and increased their access to National education resulting improved examination results.

Challenges
Increased demand by village community for more computers and maintaining the service without charging a fee is continues challenge, needing donor assistance.

Lessons learned

Hingurukaduwa e Village is an innovation in technological and social space which can deliver knowledge to the deepest rural communities to include them in education for all. Multi stakeholder collaboration and partnerships and open participatory environment help shaping future knowledge societies. Open learning evolves with local innovations.

Future

Hingurukaduwa e Village need replication to increase access to education by excluded communities. Shilpa Sayura need inclusion of adults and seniors for learning sustainable agriculture, health and livelihood development.

5.2.3 Education from Nagala Telecenter to excluded students

In Sri Lanka ICT is considered as an important subject by students taking GCE O/L examination, but in some areas of learning ICT is a luxury. Madagama is an isolated community in a highest poverty area of Monaragala district which lacked trained ICT teachers. In 2006, the GCE O/L examination pass rate was 34.08 compared to National average of 51.3 showing the status of constraint education in the area. Nagala Nenasala lead by Saman Sisira Kumara, introduced e learning at the Telecenter as a solution to Medagama students to prepare for ICT subject in National examination.

Nagala Nenasala bridging the gap of ICT education by opened a branch in Madagama. Transferred one the three computers in their Telecenter and partnered with unemployed youth Danushka to bring his personal computer and provided a service to learn ICT using Shilpa Sayura. They also trained local teachers to teach ICT in schools.

Open learning Impact

After one year Madagama Telecenter serves over 100 students; There resources has grown to 4 computers, 3 staff members. They have become valuable social enterprise supporting excluded students to study ICT for National examinations and teachers use Telecenter support to teach ICT in schools. Madagama Telecenter has complemented National education with co creation of a local ICT education service.

Challenges

The students demand learning higher ICT to develop future ICT careers and there is a replication demand from other communities and Shilpa Sayura need to develop ICT instructions in local language.

Lessons Leaned

Shilpa Sayura and Nenasala combination can help improve access to ICT education in excluded communities. Innovative local partnerships enable developing of rural societies. Social entrepreneurship is an essential element in open learning.

Future

Nagala Nenasala ICT education service needs replication in Monaragala district and Shilpa Sayura ICT subject needs up-scaling with local language and program is needed by rural youth to develop advanced ICT careers.

5.2.4 Siyambalanduwa e School access to education for all

Siyambalanduwa Nenasala was closed Telecenter before Shilpa Sayura implemented. Chaminda Nishantha a community teacher used Shilpa Sayura to transform the Telecenter to an e School introducing local language e learning to students in the area. He conducted classes to improve Math, Science, ICT knowledge to over 100 students, and directed them to prepare for National examinations through e learning. Chaminda obtained the services of a volunteer located 250km away in Colombo to teach English using Skype. Chaminda using Skype conducts online Math and Science classes to remote students in Lahugala Nenasala located 20 km away. Today Siyambalnduwa Nenasala is an example of Telecenter sustainability with Shilpa Sayura.

Open learning Impact

Shilpa Sayura and Siyambalanduwa Nenasala, using ICT innovatively, created new opportunities for local and remote students who were excluded and helped improving Math, Science, English and ICT knowledge through e learning to make examination success.

Challenges

The resource limitations have restricted the expansion of Siyambalanduwa e School to near by villages and other Telecenters.

Lessons learned

Shilpa Sayura improves sustainability of Telecenters and help transform Telecenters to rural e Schools to increase inclusion of isolated youth in education for all. The role of committed individuals makes significantly impact in Social innovation for rural development.

Future

Shilpa Sayura e School model need replication in island wide Telecenters to facilitate open learning for rural youth.

6.0 Discussion

6.1 Social Innovation in ICT4D

Shilpa Sayura and Telecenters uses ICT innovatively find a new way to educate people through open learning. Locally hosting e learning is an innovative approach to overcome communications, transportation, and energy constraints in rural societies. Shilpa Sayura helped rural youth to improve examination results increased their opportunities to enter higher education and become employed, sustaining Telecenters, empowering Telecenter operators, and developing rural knowledge networks. The openness, inclusion, participation, collaboration and partnerships has enabled Shilpa Sayura social education model to be an innovation in shaping of future rural societies.

6.2 openness in ICT4D practice

Open ICT4D, 2009 writes that "openness" emerges from three important sources of inductive logic, experiences of others, and theory. In our view the freedom also an important source to evolve openness in ICT4D. Richard Heeks in ICT4D 2.0 states that open and competitive environment are best practices in ICT4D 2.0 implementation, hence openness seems to be an important element in future ICT4D. Openness is a philosophy which describes way of doing things. The term "open" has been used in ICT to differentiate the ownership and sharing of technology and content. The open source and open content explicitly allows copying and modifying by anyone. Open ICT4D aimed at human development context is more meaningful with the participative and sharing opportunities created by openness.

6.2.1 Openness in ICT4D innovation

Peter F. Drucker defines Innovation as "change which creates a new dimension of performance." evident from the changes and performances

created by ICT4D in society, hence ICT4D is closely interlinked with innovation, where strategy, skills, values, systems and structure collectively influence innovation in ICT4D. Therefore open ICT4D is not just opening up technologies and content; a paradigm shift in ICT4D, which aims social innovation and coincides with ICT4D 2.0 (Heeks, 2009) where ICT is the development platform. open ICT4D create new perspectives of technology, content, processes and participation to creates a new perspective of ICT4D to address concerns of global poor. Richard Heeks argues that ICT4D 2.0 should also think about "wants" actually demanded by poor not only the "needs" defined in a paternalistic terms. Happiness of users emerging satisfaction is a major factor in creating individual impact leading to open ICT4D innovation.

6.2.2 Scale of openness in ICT4D

Open ICT4D 2009 writes "Openness is not a binary concept; it is scalar" therefore openness in ICT4D depends parameters that influence social, technological, political and economic context of ICT4D in practice. The openness in ICT4D "ranges from highly open to highly closed depending upon who makes it, who accesses or uses it, and how it is owned", (Open ICT4D, 2009)

	Parameters	Values
1	Owner / Implementer	Public, Private , Non Profit, Community
2	Model of the Partnerships	Public – Private – Community Public - Non Profit - Community Public - Community Non Profit - Community Private - Non Profit - Community Private – Community
3	Technology	Proprietary, open, Proprietary-Open
4	Rights of Use	Public Domain, GNU GPL, Creative Commons, open Content, Proprietary
5	Legal Context	International and/or local regulations
6	Access	Privacy, Confidentiality, Sensitivity, Security

The scale of openness in Shilpa Sayura significantly depended on factors of user needs and wants, technology, resources, quality, cost and time. The Technology choice of Shilpa Sayura was influenced by Microsoft Windows operating system used by all Telecenters, which also provided satisfactory

Unicode support for Sinhala language. National curriculum, arrangements with authors, developers and teachers influenced openness in content and agrees with the argument "given different developmental contexts and that there will undoubtedly be trade-offs between competing interests and values" (Open ICT4D, 2009).

6.2.3 Open Technologies in ICT4D

There is a general favor for using open technologies in ICT4D is a vision and someway an exaggerated fashion, argues Richard Heeks in ICT4D 2.0 "robust business models, rigorous total cost of ownership calculations, or user-friendliness" as issues in free and open software (FOSS). In our view innovation emerges from practical application where Technology choices are to be made on simplicity of implementation, convenience to users, ease of operation, maintenance and support, and cost effectiveness. Rural communities did not mind whether they use Firefox or Internet explorer; they were happier when local language content appears on their browser. It was what they wanted. However when ICT4D project need replication locally and globally, we think open technologies offer convenience and freedom for adaptation.

6.2.4 Openness in ICT4D participation

Openness helps ensuring of continuous motivation, increasing inclusion, participation and collaboration to foster useful partnerships. Participative design and prototyping help improving of self-efficacy and self-esteem of the participants leading to greater acceptance. openness for participation in ICT4D is not a token of inclusion; it is wider and a longer-term process of empowerment leading to desirable outcomes. Open participation decreases chances of "failures associated with large gaps between design expectations, and the actual realities of the project and its context" (ICT4D 2.0, Richard Heeks).

The open participatory approach of Shilpa Sayura enlarged community involvement, increased transparency and improved sustainability. Evidence is available that ICT4D initiatives using open technology but closed for participation are constrained in impact. The open participatory approach of Shilpa Sayura enlarged community involvement, increased transparency and improved sustainability. Therefore we believe creating an open participatory platform is an undoubted element in open ICT4D.

6.2.5 Ownership sharing for sustainability

Ownership Sharing enables higher state of participation, which emerges from increased collaborations and social arrangements resulting new forms of partnerships. "Ownership sharing" can be defined as sharing of decision making authority from macro to micro level; the benefits is participation of grassroots and availability of valuable knowledge of realities for design, implementation and monitoring of ICT4D. Shilpa Sayura operating 3 years as a private sector owned project, formed non-profit Shilpa Sayura Foundation by including representatives of participants at board level to share ownership.

The increased social acceptance and helped winning of Lien I3 Challenge to secure funding for up-scaling of Shilpa Sayura. Movement from closed to more open and participatory institutions generally requires fundamental changes to organizational processes and structures. (Open ICT4D, 2009). Therefore we think ownership sharing is vital strategy in open ICT4D for social acceptance and sustainability.

6.2.6 Openness in ICT4D process

Openness in ICT4D process helps ensuring of transparency, accountability and good governance. The openness in process leverages improving of policy, communications, design, development, implementation and evaluation in ICT4D. Openness in process helps early identification of "gaps in design and reality to make iterative changes in a flexible manner" (ICT4D 2.0, Heeks, 2009) to improve impact. Openness in process alone may not be good enough, unless the people who have the authority and control over the processes act in an open, trusted and proactive manner. Openness in process does not only mean transparency, but also should have agility to change the existing, integrate or create new processes if needed. Therefore open ICT4D need to embed a special process for "process evaluation" taking into consideration the results of M & E, feedback and changes in socio-economic-technical and political environment.

6.2.7 Openness in Adaptation

Future rural societies need to take charge of their own learning and development to participate in modem "learning societies". The World Wide Web (WWW) is a virtual space for open learning, yet 5 billion people live without access to internet and everywhere minority language communities are disadvantaged in content and infrastructure; Intellectual property rights of complex content in digital era can constrain innovation (open ICT4D 2009), these restrictions tend people instead of adapting good ICT4D experiences, to create new ICT4D solutions, mostly closed ones again, Increasing adaptability in ICT4D design will help increased replicating locally, nationally and globally. Facilitation of higher adaptability should be one of the prime goals of open ICT4D but should not trade-off purpose over adaptation. Shilpa Sayura design made adaptable to other languages, curriculums, operating platforms, yet didn't trade-off the needs of rural students, the project purpose.

7.0 Implications of openness in ICT4D

Open participatory platform created by Shilpa Sayura increased inclusion and participation of stakeholders, helped developing of collaborative partnerships with like minded people sharing a common purpose of developing rural societies. Openness helped motivation, effective knowledge sharing, making social arrangements resulting increased contributions from diverse stakeholders. Openness largely influenced the creation of a flat structure which provides individual freedom without necessarily hindering the progress of others.

7.1 Challenges of open learning

Open learning is challenged by none availability of computers to support increasing demand. Continuous review, enhancing of instructions, demand for new subjects and content, maintaining local support structures, efficient re-deployment "transformation" from class rooms to e learning are challenges in

open learning. ICT policy designs require attention of learned lessons of open learning and it's impact in social change.

Rural Telecenters by providing free access to learning by farmers and poor students help inclusion with ICT4D. Thalakumbura Nenasala serves over 100 users charging only 10-15 users. Open learning emerging in these excluded environments facing enlarged challenges to continue without assistance. National expenditure of 2.6% (Rs. 31.13 Billion) in free education seems a valid argument to include Telecenters in government budget to help include rural communities in knowledge society.

7.2 Opportunities in open learning

Open learning enables emergence of a new social educational model with local language technologies, self and group e learning, freedom of learners, local adaptation and social entrepreneurship which leverages local innovations at Telecenters to create new opportunities for rural communities join knowledge society.

Open learning could be used to bridge the gap of unavailability of teachers and educational resources to penetrate barriers to reach small excluded groups. Open learning can move Telecenters beyond current markets for social innovation. Once combining with solar power we can have all places accessing a to knowledge society.

7.3 Weakness of open learning

Open learning is a self guided learning process, requires learner to develop self discipline in learning not many will have, hence would be most successful with blended learning. Open learning expects leaner to take wider responsibility and challenges a transformation. Open learning although help develop education; gaps exist in understanding of the benefits and potential in development.

7.4 How open learning help developing of learning societies?

Fast changing world requires continues reconstruction of social life to face new challenges, which makes education a vital attention needing continues enhancing of subject matter, new methods of instruction and new knowledge delivery methods. ICT powered open learning provides adaptability, agility and practicality to cover a large scope of knowledge needed by rural communities to live in a learning society. Telecenters are small and an easily replicable innovation to build rural learning networks. Open learning complements National education, help bridge gaps is an open and adaptable social education model to guarantee inclusion of excluded rural communities around the world.

Open learning can be used to address Millennium Development Goals (MGDs) among of rural farmers, women and youth. The e agriculture expansion of Shilpa Sayura delivers modern agriculture knowledge as a cross cutting development in sustainable agriculture, economic development and women empowerment. Open learning takes knowledge to the learner hence can provide speed and scale for National programs, therefore the emerging social - political and economic advantages of open learning can hope to influence education policy in a pro-developmental direction to achieve education for all goals.

7.5 How open learning could be replicated locally and globally?

Shilpa Sayura in three stages replicated in 150 Telecenters of 600 who can be benefited. Local replication involves creating of local support structures, deployment, training operators, local awareness and M & E. Making a Tamil version available will benefit youth in up-country estates and war affected North and East. The vertical up-scaling involve new subjects addressing global concerns, vocational training and primary education.

In Global context, replication of Shilpa Sayura open learning model requires a local adaptation, a curriculum study and local content development. Shilpa Sayura deployment model, technologies and best practices can be adapted globally in Telecenters. Open learning can be an inspiring future educational model to provide knowledge for all.

8.0 Conclusions

ICT significantly catalyzes the development of networked learning societies, and best be used as a platform of human development.

Openness helps ensuring of transparency, accountability and good governance in ICT4D, helps leveraging of communications, design, development, implementation and assessment process.

Open ICT4D is a paradigm shift, closely linked with social innovation that can create new perspectives of development. Ownership Sharing in ICT4D, enables higher state of participation, and emerges from increased collaborations and social arrangements, resulting new forms of partnerships to help innovation, impact and implementation leading to sustainability.

Open learning at Telecenters is a new social educational model and an alternative that can be replicable globally, to transform the developing word with knowledge. Open Learning can enhance empowerment, create new opportunities and deliver essential knowledge to the door step of the excluded communities. Hence emphasize investment, research and development in this area to help shaping of education in future societies.

9.0 Acknowledgements

We would like to thank Gamini Chamra, Subash Dhanjaya, Saman Sisira Kumara, Chaminda Nishantha, ICTA e-SDI and Nenasala Teams; Nenasala operators and the users who have taken the time to answer our questions and have genuinely supported our research.

10.0 References

1. Open ICT4D, Matthew Smith, Nathan J Engler, Gideon Christian, Kathleen Diga, Ahmed Rashid and Kathleen Flynn-Dapaah, IDRC, 2009 (Working paper)

2. Cape Town Open Education Declaration (2008)

3. ICT4D 2.0, Richard Heeks , 2009

4. Shilpa Sayura – localized self and group e-learning system for handicapped students in remote, rural communities of Sri Lanka Niranjan Meegammana, Shilpa Sayura Project, 2007

5. Impact Monitoring & Evaluation for Developing of Sustainable Tele Center Networks. Niranjan Meegammana, and Rasika Sampath Sri Lanka Telecenter Community, 2009

6. E3 - Framework for Telecenter Network Sustainability Development. Niranjan Meegammana Sri Lanka Telecenter Community, 2009

7. Critical Issues for e-Learning Telecentres in Sri Lanka and India, Gaiani, Silvia, University of Bologna, Bologna, Italy , Hansson , Henrik , Stockholm University, Stockholm, Sweden , Meegammana, Niranjan , Shilpa Sayura Project, Sri Lanka , Mozelius, Peter , Stockholm University, Stockholm , Sweden

8. Uva Nenasala Needs Assessment Report, Niranjan Meegammana, 2007

9. Uva Nenasala M & E Reports 1-17, Niranjan Meegammana, 2008-2009

10. http://www.Telecentre.org (retrieved on June 28, 2009)

11. http://www.Shilpasayura.org (retrieved on June 28, 2009)

12. http://openlearn.open.ac.uk (retrieved on July 4, 2009)

13. http://en.wikipedia.org/wiki/Education_in_Sri_Lanka (retrieved on October 17, 2009)

14. http://www.doenets.lk/GCE/web/docs/statistics/pdf.pdf (retrieved on October 15, 2009)

16. http://www.innovation-award.ca

17. Evaluation of Evidence-Based Practices in Online Learning – US Government Report, 2009
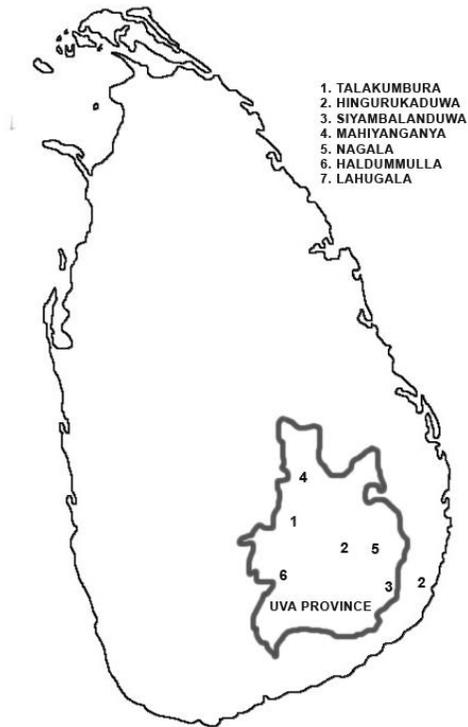
11.0 Annexes

Case Study Locations
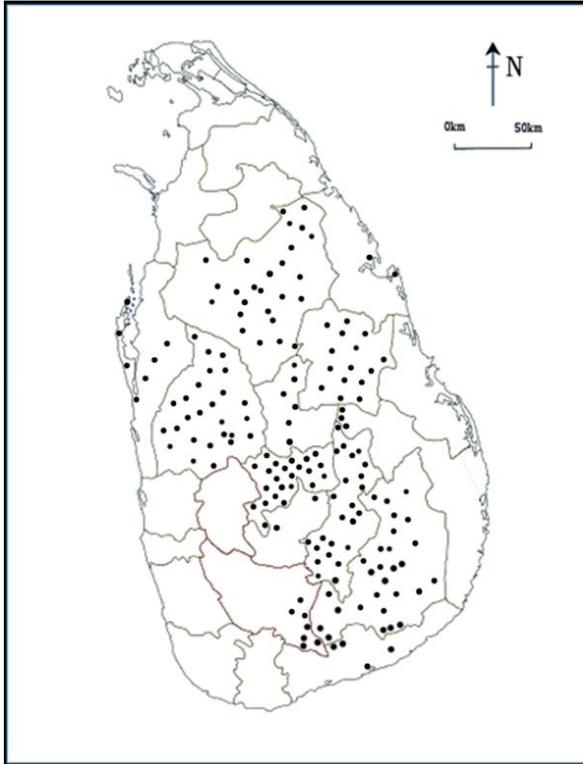

Figure 1.0

Shilpa Sayura Operating Telecenters

Figure 2.0