

Local language e learning at rural Telecentres

An imperative of ICT for increasing access to education

Niranjan Meegammana, Shilpa Sayura Foundation

Keeragolle Dhammasara, Talakumbura Nenasala

Chaminda Samarawikrama, Siyambaluduwa Nenasala

Saman Sisira Kumara, Madagama Telecentre

Abstract

In the face of emerging global challenges, from climatic change, health, economic crisis and cultural issues, education remains the foundation for innovation for the advancement of human kind. Information and Communication Technology (ICT) help us to find new ways to teach people and improve the quality of education to initiate social changes through life long learning. Hence it is important to know the future imperatives of ICT that can be used in developing people to face the 21st century challenges and to respond to crucial problems in access to education with scalable and replicable ICT innovations.

This research is done in rural areas of Sri Lanka where early school drop-off rates after secondary education ranges from 51.6% -66.9% creating an adverse effect in rural societies increasing unemployment and unrest among youth. The research studies cases of local language e learning at Telecentres in rural Sri Lanka, implemented by Shilpa Sayura – rural e learning project. This initiative created open learning environments in rural Telecentres by catalyzing the power of ICT for enabling of self and group learning of the national curriculum to increase access to education by the marginalized rural youth whose education has been hampered with lack education resources. Shilpa Sayura by creating a new means of access to education helped improving of quality and performance in rural education. This research involves four case studies of local language e learning at rural Telecentres and a survey done among rural youth to understand how local language e learning was deployed in rural Telecentres of Sri Lanka, the approaches for development, resulting social change, innovative uses of ICT, obstacles, challenges and mitigation measures in the process to initiate a learned discussion on how “local language e learning at Telecentres” can be used as an effective development instrument for social change of rural societies in the developing world

In conclusion, the research finds that Shilpa Sayura and Telecentre local language e learning model as an innovation emerged through information and communication for development for increasing access to education by marginalized rural youth which can hope to improve examination performances and reduce school drop-offs. The scaling up of this innovation can help us to bridge gaps created by disparities in access to education in rural communities to transform them as “learning societies” for engaging them with life long learning to face the challenges of the 21st century. In this context “local language e learning at Telecentres” is seen as an effective development instrument which can significantly catalyze the social change with increased access, improved quality and performance in rural societies of the developing world, hence suggest as a future imperative of information and communication for development for social change.

Keywords: Shilpa Sayura, Telecentres, education, development, social change

1.0 Introduction

In the face of emerging global challenges, from climatic change, health, economic crisis and cultural issues, education remains the foundation for innovation for the advancement of human kind. Information and Communication Technology (ICT) help us to find new ways to teach people and improve the quality of education to initiate social changes through life long learning. In this context “being “knowledgeable” will no longer be good enough without constantly acquiring advanced capabilities for critical thinking and collaborative problem-solving”³⁵ for human kind to flourish. Hence it is important to know the future imperatives of ICT that can be used to transform the developing world to a “learning society” to face the 21st century challenges to respond to crucial problems in access to education with scalable and replicable ICT innovations.

Shilpa Sayura and Nenasala Telecentres have enabled new forms of participation of rural youth in national education by creation of local language e learning environments in isolated rural communities. This information and communication for development initiative catalyzes the power technologies, partnerships and social entrepreneurship to address rural education problems in an innovative way providing an example of future imperative of information and communication development for social change. The aim of paper is to analyze and discuss local language e learning at Telecentres to understand it’s imperativeness in social change.

2.0 Background

2.1 Nenasala Telecentre Network

Nenasala meaning center for knowledge is the brand name for community driven 600 rural Telecentres of Sri Lanka, aimed to reduce digital divide, develop culture and commerce and promote community integration. They were setup by Sri Lankan Information and communications Technology Agency (ICTA) in a 1000 Telecentres rollout plan. Nenasala Telecentres are several models (Table 1.0), with 2-4 computers, a printer and many have broadband internet access. They serve rural communities with shared access to information, communication and ICT literacy. Among 60 Telecentres in Uva province where the research is conducted, 47% are located in temples is a strong cultural association in the development. One of emerging discussions is sustainability of Telecentres without government assistance.

Table 1.0 – Telecentre models in Sri Lanka

No	Model	Owned by	Number	Percentage
1	Temple	Chief priest	28	47%
2	Community Based Organization	Organization officials	11	18%
3	Non Profit Organization	Organization officials	9	15%
4	Private	Private individuals	12	20%

Source: Uva Province M & E Reports, 2008

2.2 Shilpa Sayura Project

Shilpa Sayura is a local language e learning project initiated by e fusion private ltd. with the partnership assistance of 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”.¹ Shilpa Sayura enables e learning of National curriculum at Telecentres and piloted in 20 Telecentres in 2006 and replicated in 150 Telecentres by 2010 (Fig. 1.0). “In Sri Lanka the Shilpa Sayura project has provided content in local languages which is extensively used and appreciated.”² Shilpa Sayura project has won several international ICT4D awards for its innovation, impact and implementation. “The e-Society programme which is a key component of the e-Sri Lanka Initiative, works extensively on content creation and delivery. It has laid the foundation for many successful e-content projects.”³⁴

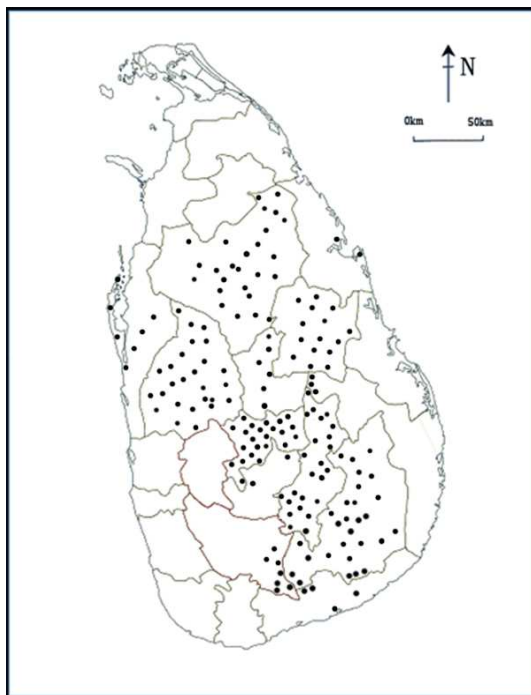


Figure 1.0 - Shilpa Sayura implemented Telecentres

Source: Shilpa Sayura Project 2006-2010

2.3 The general context of education in rural Sri Lanka

It is compulsory that all children attend school till age 14. To pursue higher education one must pass the General Certificate of Education (G.C.E) Ordinary Level (O/L) and G.C.E. Advanced Level (A/L). There are 9506 schools under provincial government mostly located in rural areas. The constitution of Sri Lanka states that "the complete eradication of illiteracy and assurance to all persons of the right to universal and equal access to education at all levels" (Article 27 (2) h) and the government since 1942 has been providing education free of charge. However comparing urban and rural education one can observe that there are disparities exist in access to education in rural areas. Among 9829 public schools (75.5%) has less than 1000 students (90.8%) are assumed as rural schools (Table 2.0) in this research. The GCE (O/L) examination results in 2006 (Table 3.0) shows only 48.70% were able to qualify for G.C.E. Advanced Level (A/L). Math (57.37%), Science (51.65%) and English (63.18%) subjects have the highest failure rates. (Table 4.0)

Table 2.0 - Schools and Student Distribution in Sri Lanka

Number of Students	Schools	Percentage
1-5	1363	13.87
51-100	1338	13.61
101-200	1989	20.24
201-500	2735	27.83
501-1000	1429	14.54
1001-1500	506	5.15
1501-2000	206	2.10
2001-2500	114	1.16
2501-3000	72	0.73

3001-3500	30	0.31
Above 3500	47	0.48
Total	9829	

Source: Statistics Department Sri Lanka

Table 3.0 - Uva province G.C.E O/L examination results 2006

Education 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

Table 4.0 – 2006 Examination Results by Subject

No	Subject	Sat	Passed %	Failed No	Failed %	failed %
31	English Language	258975	36.82	95355	163620	63.18
32	Mathematics	259265	42.63	110525	148740	57.37
34	Science & Technology	258948	48.35	125201	133747	51.65
43	Social Studies & History	259096	75.48	195566	63530	24.52

51	Art	109763	54.45	59766	49997	45.55
21	Sinhala Language & Lit.	210198	79.19	166456	43742	20.81

Source: Examination Department Sri Lanka

Early school drop-off is a major issue in rural societies evident from following graph derived from national education statistics in 2002. The number of students in grades starts to decline after grade 5 primary secondary education then drops shapely after G.C.E O/L examination.

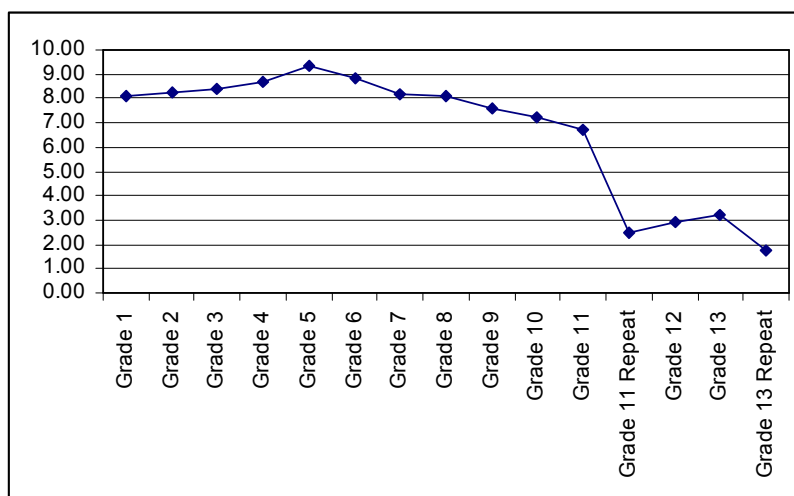


Figure 3.0 – Pattern of school drop offs in Sri Lanka

The poverty head count ratio of 27 in research area (Table 6.0) is well below the national average of 15.2 indicating poor education conditions in the research area.

Table 5.0 - Poverty head count ratio of Sri Lanka and Uva Province

	1990/91	1995/96	2002	2006/07
Sri Lanka	26.1	28.8	22.7	15.2
Uva province	31.9	46.7	37.2	27

Source: Statistics Department of Sri Lanka

3.0 Methods

The methodology used in this paper is to be classified as case study research (Benbasat et al. 1987, Yin 1994). The information gathering process involved four case studies of rural Telecentres (Table 6.0) in Uva Province (Figure 2.0). The data collected through Telecentre visits, interviews, questioners and observations during 2008-2009. We interviewed 5 experienced Telecentre managers in depth and informal discussions held with community leaders, teachers and parents. A survey was carried out among 176 students at 6 Telecentres (Table 7.0). Telecentre manager interviews were focused on finding their approaches to e learning deployment. The informal discussions held with teachers, parents and community leaders helped understanding rural education issues and the implications of Telecentres and Shilpa Sayura e learning system was studied to find out innovations in technical and pedagogical approaches.

3.2 Case studies and data collection

Telecentres studied (Figure 2.0) were located in rural villages in Uva province affected with high poverty (Table 5.0).

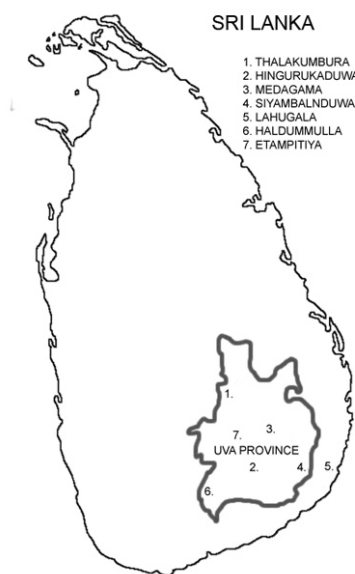


Figure 2.0 - Case study locations

Table 6.0 – Information on case studies

	Case & Location	Data collection methods	Field studies by	Year
1	E learning at Telecentre changes lives of young priests Talakumbura Telecentre	Interviews, Observations, Questionnaires	Niranjana Meegamma, Rasika Sampath, Keeriyagolle Dhammasara	2009
2	Telecentre enables education at homes Hingurukaduwa Telecentre	Interviews, Observations, Questionnaires	Niranjana Meegamma, Rasika Sampath	2009
3	Telecentre builds capacity of ICT education in Schools Madagama Telecentre	Interviews, Observations, Questionnaires	Niranjana Meegamma, Rasika Sampath	2009
4	E learning at Telecentre improves examination performance Siyambalanduwa Telecentre	Interviews, Observations, Questionnaires	Niranjana Meegamma, Rasika Sampath	2009

3.1 Questionnaire responses

A questionnaire (Form 1.0) was used for collecting data from Telecentre users included open questions on educational tools they use and preferences of tools and how often the tools are used? What subjects are learned and how the learning is done? And the difference of Telecentre and school education, their achievements made using Telecentre, obstacles and

		15,13,14,15,15		
Hingurukaduwa	21	15,14,14,15,14,13 ,14,17,12,12,14,1 5,12,12,11,13,13, 14,13,11,12	Female: 11 Male: 10	Sinhala : 21
Nagala	22	15,15,15,15,15,15 ,15,15,15,15,15,1 5,15,16,15,16,15, 15,15,15,16,15	Female:17 Male: 5	Sinhala : 21
Siyambalanduwa	75	11,11,12,12,12,12 ,11,12,11,11,11,1 2,11,13,11,13,12, 12,12,12,12,12,12 ,12,12,12,12,11,1 1,11,12,12,12,12, 13,13,13,13,13,13 ,14,13,11,11,11,1 2,12,11,12,12,12, 12,11,11,11,13,12 ,13,13,13,11,11,1 1,11,11,11,11,11, 11,11,11,11,11,13 ,13	Female: 48 Male: 27	Sinhala : 75
Haldummulla	16	14,12,13,13,13,11 ,13,13,13,13,13,1	Female : 5 Male : 12	Sinhala : 7 Tamil :9

		3,14,14,14,13		
Etampitiya	20	14,15,15,14,13,11 ,9,14,15,14,11,13, 15,12,14,14,12,14 ,15,14	Female : 13 Male : 7	Sinhala : 10 Tamil :10
Overall	Total : 176	Median : 13	Female : 99 Male :77	Sinhala: 157 Tamil:19

4.0 Results

4.1 Responses for interviews and discussions

Respondents expressed that their villages are facing a disparity in inclusion in national education pointing out that “poor transportation and lack of education facilities makes villages less attractive to teachers”. The teacher and student ratio of urban and rural schools were 24.20 to 6.51 (Table 8.0) in Uva Province seen as a disparity in availability teachers in urban and rural schools.

Table 8.0 – Comparison of teacher and student ratios

Uva Province	Schools	Students	Teachers	Ratio
National schools	36	15365	2360	6.51
Provincial schools	793	288713	11929	24.20
Sri Lanka				
National schools	323	505347	27953	18.08
Provincial schools	9506	3521728	159046	22.14

Source: Statistics Department of Sri Lanka

“Students who can afford a city school leave the village and those who stay are the ones drop school” a village headman said. Lack of Math teachers causes high failure rates” said a Teacher. Rural students also have a constraint in attending school regular basis, “during planting and harvesting times students miss school helping parents in agriculture work” said a school principal. Youth school drop off issue is clearly evident in Uva province G.C.E O/L examination results in year 2006 (Table 3.0) and confirming that “Poor education facilities in Uva province has caused poor examination results increasing early school drop offs and unemployed youth”¹⁹. At the group discussions parents agreed that Telecentres are helping to improve education of their children.

4.2 Analysis of data from the survey

We found that Shilpa Sayura, Azeem Premji, ICT learning CDs and Google image search as main education resources used by students at Telecentres. There is a barrier in English language as only 2.3% of the students used MS Encarta or Wikipedia. All students of Siyambalanduwa Telecentre stated that knowledge of English is an obstacle. 94.5% of the students choosing Shilpa Sayura and Azeem Premji as their favorite educational tools, indicates that preference of local language tools by rural students. The survey found average e learning time of a student is 8.4 hours per month which is significantly a lower figure than developed societies. 67% of the learners are engaged in self and group learning at Telecentres while 43% of younger group engaged group learning (Table 9.0).

Table 9.0 – Learning methods at Telecentres

Learning Method	Students	%	Median Age
Self Learning	15	8.5	14
Group Learning	43	24.4	11
Self and Group Learning	118	67.0	13

The most learned subjects at the Telecentres (Table 10.0) were ICT (91.4%), Math (67.6%), Science (62.5%) and English (35.8%). Math (57.37%), Science (51.65%) and English (63.18%) were most failed subjects in G.C.E O/L examinations. 91.4% of the students learning ICT at Telecentres is an indication of important role played by Telecentres in increasing ICT literacy in rural societies.

Table 10.0 - Subjects learnt at Telecentres

Subject	Students	%
ICT	161	91.4%
Math	119	67.6
Science	110	62.5
English	63	35.8
History	37	21.0
Music	17	9.7
Dancing	15	8.5
Tamil	13	7.4
Photography	12	6.8
Sinhala	11	6.3
Agriculture	4	2.3
All	2	1.1
Buddhist Culture	1	0.6
Religion	1	0.6

One of the most important findings is that 78.2% of the students, who learned at Siyamblanduwa Telecentre, were able to pass G.C.E. O/L examination in 2009, making a significant improvement in examination pass rate compared to 36.1% pass rate recorded in the district in 2006. All students took part in the survey agreed that “e content is better than text books”. The students found self learning (49.43%) and extra learning (45.45%) as the main differences of Telecentre (Table 11.0) to their school. We found that some schools in the research area although had ICT facilities, lacked local language digital content. Students appreciated learning at the Telecentres for “easy learning”, “repeat learning” and “learning subjects not available in school” and described their positive experiences as “Interesting”, “easy” and “enjoyable”.

Table 11.0 - The difference of Telecentre to the school

Response	Number	%
Self learning	87	49.43
Extra learning	80	45.45
Interesting	27	15.34
E learning	20	11.36
Enjoyable	17	9.66
Easy learning	8	4.55
Internet	7	3.98
Repeat learning	7	3.98
ICT education	5	2.84
More information than school	5	2.84
Practical learning	5	2.84
Advance learning	3	1.70

Learn extra subjects	2	1.14
Improving knowledge	1	0.57

59.4% students stated that “improving of weak areas of subjects” as their achievement of using Telecentres (Table 12.0), indicating that Telecentres are strengthening the education at the school. Students saying “Telecentre was open when ever we wanted to learn” is a self expression of openness experienced at the Telecentres.

Table 12.0 - Achievements of using Telecentre

Achievement	Students	%
Improving weak subjects	105	59.4
Using computers to learn	39	22.2
ICT learning	11	6.3
Extra Learning	10	5.7
Improving ICT knowledge	8	4.5
More knowledge	7	4.0
e Learning	6	3.4
Quick and easy learning	5	2.8
Wining certificates	4	2.3
Practical learning	2	1.1
Easy learning	1	0.6

4.3 Case Studies

4.3.1 E learning at Telecentre changes lives of young priests

Thalakumbura Telecentre located in a Buddhist temple, in Badulla district, Sri Lanka, is run by volunteers keeping it till late night to serve over 100 youth learning at the Telecentre sharing 3 computers. Students walked to the Telecentre from villages as far as 4km. Among learners were young priests who studied in the religious school Pirivena. They were not able sit for G.C.E O/L examination as the religious school did not cater much advanced national curriculum. Hence they were marginalized with the opportunities to enter senior secondary level leading to higher education in universities.

Five young priests self and group learning from Shilpa Sayura local language resource at Telecentre were able to pass G.C.E O/L national examination in 2008. Telecentre and Shilpa Sayura collaborative created them an open learning environment to access national education. “We prepared for the examination learning from Shilpa Sayura” said young priests. This performance improvement resulting from learning behavior modification of rural youth is an example of social change enabled by local language e learning at the Telecentres. “After the success of young priests more young people are using Telecentre” said head priest. Although the young priests were a special social group with different life objectives, shared limited resources with other learners for self and peer to peer learning which transformed them to a “self help learning society” of social cohesion providing an evidence based example for developing world how Telecentres and local language digital content could be used for rural education development.

Impact

Shilpa Sayura and Telecentre combination helped changing of the lives of young priests by enabling access to national education through local language e learning²³. The Telecentre became a sustainable and valuable education resource for the local community.

Challenges

Rural Telecentres are facing challenges with limitations in infrastructure with the increasing of learners demanding access to education. The poverty in rural areas is challenging Telecentres to continue social purpose driven free services models, needing external assistance for social change through ICT.

Lessons Learned

Shilpa Sayura like local language e learning resources at Telecentres can help increase rural youth participation in national education

4.3.2 Telecentre enables education at homes

Hingurukaduwa is an isolated village faced with education challenges due to poor transport, communication and energy problems. “The education opportunities for our youth are very limited due to isolation” said Telecentre manager, who started the Telecentre with a used computer in 2002 to teach ICT and English to the village youth. The Telecentre through social entrepreneurship obtained used computers from corporations and placed them at village homes with Shilpa Sayura to be shared by 5-6 students for e learning which formed 20 “neighborhood learning groups” which they called an “e village”.

The enabling of e learning at homes benefited students live far from Telecentre, specially young girls who were restricted outside travel by local family culture. The small e learning groups formed by students created a “learning society” in village, which also included parents who learned to use computers from their children. The e learning groups also shared educational CDs and books from Telecentre library. The technical support was provided by a

group of volunteers who were early beneficiaries of the system. The senior students conducted ICT classes at Telecentre in week ends and evenings are an example of how learners can become teachers for peer to peer learning. At the group discussion the parents appreciated the “e learning enabled at homes” and agreed that the children are improving in school performance. A student said “learning with Shilpa Sayura at home, I was able to improve my standing in the school”.

The Telecentre provided their services free and also operated a micro scholarship program supported by donors. Paying for learning is an innovative concept we found at Hingurukaduwa Telecentre. One of the good examples is a case of a youth who wanted to study in Science stream in G.C.E Advanced level, but could not do so as the village school only had teachers for Art subjects and poverty was a barrier to attend a school outside the village. The Telecentre scholarship helped the youth to learn java programming and obtain an internship in Shilpa Sayura development team. In another case two youth who developed software for learning English won “National Young Computer Scientist” award in 2007, a remarkable achievement in the rural context. Our studies in village school showed that students learning at Telecentres are performing better than others as well as examination performance had been improved.

Impact

The Telecentre by enabling local language e learning at village homes created a new form of rural youth participation in national education which resulted increased access to education and improvement of their performance in examinations.

Challenges

increased demand from rural youth for e learning at homes is creating challenges to Telecentre to maintain a totally free services model under shrinking donor assistance, hence up scaling and replication of the innovation is a challenge.

Lessons learned

Enabling of local language e learning at village homes using shared computers can create “neighborhood learning groups” enabling new forms of participation in national education by isolated rural youth. This innovative model can be replicated in large scale to increase access to education and empower marginalized rural youth.

4.3.3 Telecentre builds capacity of ICT education in schools

When ICT was introduced as a subject in Sri Lanka G.C.E O/L examinations in 2006, students living in Madagama, in Monaragala district, were marginalized as they did not have trained ICT teachers. A teacher of the local school said, “I am teaching only office applications to students” stating the knowledge constraint faced in teaching ICT curriculum. The average of pass rate of G.C.E O/L in 2006 in the area is 34.08% which is a very low rate compared to national pass rate of 51.3%. When the condition of general education is such, introducing ICT as a subject was a major challenge for schools to serve student needs. A student said “I want to learn ICT for future employment” stating a strong reason for rural students to consider ICT as an important subject.

Nagala Telecentre situated 20 km away from Madagama, decided to address the ICT education problem of Madagama. The G.C.E O/L ICT curriculum is a two year study covering theory and practice in programming, number systems, logic gates, computer hardware, networking, computer security, internet, web designing, animations, office

applications and ICT in society which goes beyond basic computer literacy training usually provided at Telecentres. Madagama Telecentre was started by bringing one of the three computers at Nagala Telecentre and sharing another computer belonging to an unemployed youth at Madagama, which created a local ICT employment opportunity.

Over 50 students and several teachers joined the Telecentre to learn ICT for G.C.E O/L curriculum after an awareness session conducted at local school. Magagama Telecentre introduced a blended learning model using Shilpa Sayura self and group e learning model and instructor guided teaching. “Shilpa Sayura had all the content needed to teach O/L ICT” Telecentre manager said. Group sessions held at Telecentre helped peer to peer learning through knowledge sharing. A student said that “all content were made available in electronic form helped self learning at my own pace”. Telecentre also helped training of local teachers in ICT providing Shilpa Sayura ICT content to the school. “Telecentre created learning opportunities for students that were not available before” said the principal of the local school.

In August 2009 the first group of students who learned at the Telecentre taking ICT subject in mid term test “showed an improvement of performance” said teacher in charge of ICT. Among students learning at the Telecentre, 11 students sat for GCE O/L examination in December 2009 and passed ICT subject. The enabling of learning national ICT curriculum at Telecentre and the capacity building of local school voluntarily by the Telecentre is an example of creating “learning societies” through social entrepreneurship which also shows the potential of Telecentres to partner with local schools to improve ICT education in marginalized rural societies, which is also a means of increasing value and sustainability of Telecentres.

Impact

The marginalized students whose school lacked the capacity for ICT education were able to improve performance at school and pass ICT subject in national examination through e learning at the Telecentre. The Telecentre and school collaboration increased learning opportunities for youth and strengthened the school's capacity for teaching ICT.

Challenges

Learning ICT in rural societies is a challenge. Telecentres who are able to bridge this gap are facing challenges in finding capital infrastructure.

Lessons learned

E learning and collaboration of Telecentres with local schools can help bridging of the disparities in access to national education. This experience can possibly be replicated island wide to address the problem of lack teachers for teaching of national ICT curriculum

4.3.4 E learning at Telecentre improves examination performance

Siyambalanduwa is one of the highest poverty communities in Uva province. The education constraints are reflected from 63.16% of the candidates failing G.C.E O/L examination in 2006. "Young people are failing examinations is a major issue in our community" said the head priest of the temple. The Telecentre started in 2006 was closed down due to lack of community participation. The Telecentre was re-opened in June 2008 with the introduction of Shilpa Sayura. The Telecentre facilitated local language e learning for Math, Science and ICT creating a new learning opportunities for the village youth. "I improved my Math using Shilpa Sayura" said a student learning at the Telecentre.

Among the students who learned at the Telecentre, 102 students sat for G.C.E O/L examination in 2008 and 80 students (78.4%) were able to pass the examination. This is a significant impact on change of performance enabled by the Telecentre comparing to 36.84% pass rate in the district. “The impact has been resulted from the local language e learning at the Telecentre” said Telecentre manager. Learning English was constrained in Siyambalanduwa due to non availability of English teachers. The Telecentre obtaining a service of an English teacher located 250km away in Colombo, used Skype video conferencing to find a new channel to receive English knowledge. “Learning on Skype improved my English speaking” A student said. Users have quickly adapted to the new experience of learning from distance enabled by ICT. The e learning deployment approaches used by Telecentre were blended with self and group learning, distance learning and teaching under an open hut at the Telecentre. Local language content was used as the center of focus of self and group learning. This case provides an example on how ICT could be used innovatively deliver knowledge to isolated rural youth affected with constrained access to national education and improves their performance in examinations.

Impact

Local language e learning has transformed the Telecentre to a community e school, and helped social change by improving of rural youth examination results. Video conferencing technologies helped transferring of knowledge for youth constrained with access to learning English.

Challenges

Knowledge of English is a barrier in rural societies to access global knowledge. Therefore it

requires increasing of local language content in all disciplines to engage them in life long learning for social change. Connectivity is a challenge in rural communities to use ICT as a means to increase access to education through distance learning.

Lessons learned

Local language e learning at Telecentres can be used to improve examination performance of rural youth and help sustaining of Telecentres. ICT can be used as an effective tool to deliver knowledge to isolated distance rural communities.

5.0 Discussion

5.1 Social change through ICT innovation

Mansions (1997, n.a) writes social change as transformation of culture and social organization over time to address constantly emerging socio-economic and environmental challenges. Social change happens everywhere, sometimes intentional and often unplanned and caused by culture, conflicts, ideologies, environmental factors, economic and political advantages, change of demographics, social movements, globalization, values and ethics. Similar to humanist ideologies of the European Renaissance in 14th century that transformed the human kind, developments of information and communications during last two decades is transforming our world. The Internet Transmission Control Protocols (TCP) developed in 1973 by Vinton Cerf, created internet which constantly change how we access and share knowledge, communicate and do business.

Peter F. Drucker defines innovation as "change which creates a new dimension of performance" where strategy, skills, values, systems and structure collectively influence the process on innovation. Social change resulting from innovation, so called Social Innovation,

is a paradigm shift of the society created by new perspectives of technology, content, processes and participation to address local concerns. Shilpa Sayura and rural Telecentre combination is seen as a social innovation emerged through “e Sri Lanka” project, the information and communication for development initiative of island nation Sri Lanka, started in 2002 for poverty reduction, social and economic development, and peace building thorough innovative use of ICT to meet the social and economic needs of the most vulnerable communities. Social Innovation is a spinning process of research and development where “the relationship between the practical application of communication processes and technologies achieving positive and measurable development outcomes is an emerging subject of research, discussion and conjuncture”. (Servaes, 2008, p 389)

5.1 e Learning at Telecentres

As demonstrated in four case studies, Telecentres created open learning environments using local language e learning resources to enhance rural youth access to national education, is making a “significant contribution by Telecentres for including the rural people in the knowledge economy both directly and indirectly”². The increasing access to education is serving of “the need of the hour is to find an alternative path to get a tertiary qualification; which could be done only through the use of distance mode” (Warnapala, 2009, p 80). In these cases Telecentres are going beyond basic access to information and communication model by transforming them to a form of e schools to increase access to national education.

The “learning neighborhoods” created by Telecentres are seen as building blocks of a “learning society”. Telecentres providing access to learning without age, gender, subject and economic restrictions makes education more inclusive. “Telecentre was open when ever we

wanted to learn” statement by students describes the freedom and openness experienced at the Telecentres confirming that “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).

In an era where new solutions are sought for regeneration of education, Telecentres inherited with culture, technology, openness, informal approaches and strengths of “social entrepreneurs, who work on the fringes of the mainstream, devising new approaches”³⁶ engages rural communities in life long learning for social change. The students finding Telecentre as a place for “improving weak areas of subject” is a distinct advantage enabled by ICT and openness for learning that enable users to backtrack and review lower grade lessons for improving knowledge on the subject matter. Hence Telecentres are bridging gaps largely unattended by formal education. Therefore we see that Telecentres role, if exploited in the context of improving national education, can help “to reach the critical mass needed to bridge the digital and knowledge divides”⁶ for social change in rural societies.

5.2 Shilpa Sayura innovations in rural education development

In broad context E-learning is described as “all forms of electronically supported learning and teaching. The Information and communication systems, whether networked or not, serve as specific media to implement the learning process”³, in which real time access and availability, mixes of learning methods, simulation, collaboration, enhanced pedagogies, digital content, independency of time and places of learning are prime advantages. The mixing, matching and scaling of these attributes help produce unique education models that serve specific human learning needs and capacities.

Shilpa Sayura education development model is focused on increasing access to education through local language e learning at Telecentres which aims to reduce school drop-offs of rural youth whose education is hampered by lack of education resources. This system based on national curriculum provides a mass content base which includes multi pedagogical learning objects, structured into multi subjects for multi grades to deliver integrated knowledge to wide spectrum of learners and purposes through a single system. The access to e learning has been made connectivity independent hosting the system locally. This distinct feature increases the possibilities of delivering knowledge to distance communities facing communication and energy issues. The Telecentres acting as “social purpose organizations and individuals who are helping their beneficiaries”⁵, have made local innovations in e learning to address local education problems. Shilpa Sayura thin architecture designed to run on web server enables implementation in low resource environments like rural Telecentres. Its local language interface enables inclusion of wider spectrum of users minimizing the language barriers. The national curriculum based mass knowledge base organized into subjects, grades, modules, lessons, activities and self-assessments creating an enhanced learning environment. The facilities for learners to create and share content and interactions enabled through chat, discussions, messages and comments help engaging learners in a continues learning process which “naturally combines the observations and ideas”⁸ for self learning

In Shilpa Sayura e learning model the learning management is done by the learners using the curriculum information and peer to peer interactions which implements collaborative learning through “enhanced access otherwise normally restricted”⁴ in rural areas. Shilpa Sayura modifies the learning behaviors of rural youth by enabling learning on a self determined time

and space using digital content and pedagogies designed specifically on “learner-centered strategies”¹⁶. The self-organized and self motivated learning model of Shilpa Sayura enables “learners to take challenges in the formal curriculum, becoming “users of education rather than recipients where learning is more enjoyable, fun and playful as well as demanding and stretching to reach curriculum objectives”³⁶. Self learning helps accumulation of knowledge through one's own experiences to understand real world in depth and group learning develops knowledge through shared experiences and help testing of what's learned. Collaborative and cooperative learning in a group help exposing the learners to peer viewpoints. Hence self and group learning enabled by Shilpa Sayura responds to learner needs with more flexibility “making them to think rather than copy and memorizing in current "push" system of the education”³⁶.

In ICT enabled self and group learning environments help " individuals to 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).

Shilpa Sayura knowledge base combines the knowledge of the subject experts with technical expertise to inspire new ways of learning. The integrated content “includes text, supported by movie clips, photographs, animations and interactive exercises, java applets, which goes far beyond a textbook’s ability to impart subject knowledge”¹ helps empowering of the learners with electronic access to subject expertise within their community otherwise not available.

The lessons enhanced with ICT based pedagogies help developing of “thinking, social and personal skills to develop an integrated person”⁷ and engagement in shared learning activities to help learners to revise what is known, explore the unknown in order to construct

new knowledge and meanings as required by national curriculum, hence “ICTs may be of use to enhance education of the poor where Informal education developing functional skills matters as much if not more than formal education”⁹. Therefore we see Shilpa Sayura and Telecentre combination creating “learning neighborhoods” and “self help learning societies” as new way of increasing access to education that can be used as a development instrument to initiate social change in rural societies

5.3 Imperativeness of local language ICT in development

Local language technologies emerged through the development of ICT during the last two decades has created new form of inclusive access to knowledge by rural societies. In Sri Lanka, 99.4% of the student population is studying in Sinhala and Tamil local languages and majority of them live in rural areas. The choosing of local language educational resources as their favorite by 93.4% of the respondents and stating “e content is better than text books” by all respondents of the survey is a clear indication of the imperativeness of local language ICT in rural education which can “facilitate learning by providing real world contexts that engage learners in solving complex problems.”¹⁰

The gaps of shortages of text books and teachers in rural areas can be bridged by introducing local language digital content to provide knowledge, simulation and collaboration for learning. The UNESCO report on Minority Language Contexts in Asia states that linguistic and cultural differences are a rich resource, rather than a problem to be solved. Farmers and women e learning Agriculture and Art at Telecentres is a result of their cultural association of local language to the knowledge. The local language technologies and digital content can help bridging of the gaps created by “lack of literature for learners of first language frequently which poses the single greatest challenge to the sustainability of multilingual

education programs”.¹¹

The local language technology developments in Sri Lanka were driven through a collaborative social innovation process involving academic, private sector, government and international and developer community evident from “Several organizations produced Sinhala fonts and word processing packages, which are currently in use.”¹². The development of SLS1134 standard for local language, localization of applications and local language content development initiatives in Sri Lanka provide fine examples of innovation through ICT. One such example is Shilpa Sayura project funded by government of Sri Lanka, implemented by private sector by collaborating with community which has helped pioneering of local language technologies. Telecentre M & E reports²³ states that local language technologies and content attracted youth, women, farmers and seniors for learning at Telecentres increasing community participation and Telecentre sustainability. It is a clear indication of how local language ICT can help inclusion of rural people in the “learning society” for engaging them in a life long learning process for social change.

5.5 Obstacles, challenges and mitigation measures

The demand for access and available resource has a significant gap in Telecentres. The “local and macro economic factors heavily influence public access to information and communication through ICT”¹³. Telecentre driven education development requires mechanisms for monitoring, evaluation and support, yet “lack of formalization of political support for Telecentres in the legal and regulatory framework”¹³ is an obstacle for sustainable development. Telecentres require transformation to a sustainable local revenue

generation models, however it is a constant challenge in low income rural societies, hence philanthropy, donor and government assistance is a necessity.

The “initiation, diffusion and adoption of the Telecentre idea had been an enormously electric process, largely devoid of systematic research and planning”¹⁴, hence developing of “e learning at Telecentres” require capacity building and establishing of local support structures. Telecentres due to geographical and cultural differences tend to operate in isolation hence lacks access to network resources. “The advantages of clusters or networks of Telecentres working together in a region to develop and share a variety of resources”¹⁵ is an important concept for network wide development for social change.

Lack of awareness of benefits of ICT among rural communities is a challenge in ICT driven development for social change, hence creating of awareness on “ICT as a valuable resource for life” is a critical need. Telecentres are enabling broad-based community participation in education, however “challenge may still exist reaching out to ethnic minorities, women, children and the elderly who are often on the minus side of the digital divide”¹⁴.

ICT pilot initiatives “create gaps in project designs and implementation; hence require dynamic re-designing of projects to meet unexpected ground conditions; in which local adaptation, innovative partnerships, creating local support structures and creating benefits to participants has a significant outcome.”¹⁵.

The maintenance of an e learning system in Telecentres with periodically changing national curriculum requires systematic review, updating, enhancement of instructions, re-deployment, technical support and M & E covering a larger geographic is a challenge.

Overcoming these challenges requires constant assistance of funding agencies, rural communities and partners.

6.0 Conclusions

We see Shilpa Sayura and Telecentre local language e learning model which enables creation of “learning neighborhoods” as an innovation of ICT for development for increasing access to education, which can hope to improve examination performances and reduce school drop-offs among marginalized rural youth. “Shilpa Sayura project has provided content in local languages which is extensively used and appreciated”² hence up-scaling and replication of this innovation can help bridging of the gaps created by disparities in access to education and enable development of “learning societies” for social change.

ICT innovations like Shilpa Sayura can hope to become sustainable social change methodologies, when tested as a replicable solution; however such innovations creating impact as pilots, seldom receive attention for up-scaling and replication for large scale social change. Hence processes are required to identify and support “untapped opportunities exist to multiply and scale up successful pilot projects and approaches”¹⁶ for increasing benefits to the society at large to become imperatives of ICT for development.

Local language e learning at Telecentres is seen as an effective development instrument which can significantly catalyze the development of “learning societies”, by creating “lifelong learners who is flexible and able to adapt to change”³⁷, hence suggest as an imperative of ICT for development and social change, emphasizing increased research to explore its applications for social change in developing world.

8.0 References

1. Shilpa Sayura –Localized Self and Group e-Learning System for Handicapped Students in Remote, Rural communities of Sri Lanka, Meegamma, N., e –India 2007, New Delhi, 2007.
2. Critical Issues for e-Learning Telecentres in Sri Lanka and India, Gaiani, S., Hansson, H., Meegamma, N., Mozelius. P., M-2009, Maastricht , 2009
3. Is e-learning the Solution for Individual Learning?, Tavangarian D., Leypold M., Nölting K., Röser Journal of e-learning, 2004
4. Open ICT4D, Smith, M., Engler, N., Christian, G, Diga, K., Rashid, M., Flynn-Dapaah, K., IDRC, 2009
5. Transition with in the Ecosystem change, Cheng, W., World that Changes the World, 2010, Jossey-Bass
6. Partnerships in Development Practice: Evidence from multi-stakeholder ICT4D partnership practice in Africa, UNESCO, 2005
7. E3 - Framework for Telecentre Network Sustainability Development. Meegamma N, NITC, Colombo, 2009
8. New School Curriculum, I.L. Ginige, NIE, 2009
9. Towards Universal Primary Education, special issue of Mainstreaming ICTs, OWSA, Vol. I/no. 2,2004).
10. Duffy & Cunningham, 1996; Honebein, 1996; & Cognition and e Technology Group at Vanderbilt, 1992).
11. Challenges of enabling IT in the Sinhala Language, Gihan V. Dias, UOM, 2008
12. Henry M. Walker, "Collaborative Learning: A Case Study for CS1 at Grinnell College and UT-Austin", Proceedings of the Twenty-eighth SIGCSE Technical Symposium on Computer Science Education February 27-March 1, 1997, pp. 209-213.

13. Libraries, Telecentres and Cybercafés: A study of public access venues around the world
Submission to IFLA, Quebec, 2008 Chris Coward, Ricardo Gomez, Rucha Ambikar,
University of Washington, Information School
14. Themes and Issues in Telecentre Sustainability, Raul Roman & Royal D. Colle, 2002
15. User Modeling in a Distributed E-Learning Architecture , Peter Brusilovsky, Sergey
Sosnovsky and Olena Shcherbinina,
16. The Design of Effective ICT-Supported Learning Activities: Exemplary Models,
Changing Requirements, and New Possibilities, Cameron Richards, 2005
17. Up-scaling and replication? 150 Experiences, Meegamma N, R. Sampath, V.M.
Krishna, G. Chamara, S. Dananjaya, G. pradeep, e-Asia 2009, 2009
18. Up-scaling pro-poor ict-policies and practices: Gerster, R., Zimmermann S.,2005)
19. Cape Town Open Education Declaration (2008)
20. Impact Monitoring & Evaluation for Developing of Sustainable Tele Center Networks.
Niranjan Meegamma, and Rasika Sampath Sri Lanka Telecentre Community, 2009
21. ICT4D 2.0, Richard Heeks , 2009
22. Uva Nenasala Needs Assessment Report, Niranjan Meegamma, 2007
23. Uva Nenasala M & E Reports 1-17, e fusion private ltd, 2008-2009
24. Status of Literacy in Sri Lanka: Gaps, Challenges and Possibilities, Chandra
Gunawardena, Open University of Sri Lanka, 2001
25. Evaluation of Evidence-Based Practices in Online Learning – US Government Report,
2009
26. Scale-up, Presentation at the GKP South Asia Regional Meeting: Wijayananda, J., 2004
27. Towards Universal Primary Education, special issue of Mainstreaming ICTs, OWSA,
Vol. I/no. 2, 2004

28. Communication Centers and Developing Nations: A State-of-the-Art Report, Colle, R. and Roman, R. (1999). Cornell University, Ithaca, NY.
29. Universal Access for Rural Development: From Action to Strategies., Ernberg, J. (1998). International Telecommunication Union (ITU), Geneva.
30. Telecenter Evaluation: A Global Perspective. Gómez, R. and Hunt, P. (1999). International Development Research Centre (IDRC), Ottawa.
- Intelecon Research & Consultancy Ltd. (1999 and 2000). Funds for Rural Telecom
31. Access and Empowerment Experiences and Lessons from the Multi-Purpose Community Telecentres (MCT) in Uganda , Mayanja, M. (2000), UNESCO.
32. Macionis, John J., (1997), Sociology, (6th. ed.), Prentice Hall: New
33. Servaes, J. (2008). Communication for development and social change. Sage Publications
34. Capacity Building for ICT in Education, InfoDev, 2010
35. The Learning Society, CISCO, 2010
36. Learning from the Extremes, Charles Leadbeater and Annika Wong, 2010
37. Equipping Every Learner for the 21st Century, CISCO, 2010
38. <http://www.Shilpasayura.org> (Accessed on September 28, 2010)
39. <http://www.doenets.lk> (Accessed on September 20, 2010)
40. <http://www.statistics.gov.lk> (Accessed on August 15, 2010)
41. <http://www.nenasala.lk> (Accessed on August 21, 2010)
42. <http://www.telecentre.org> (Accessed on September 11, 2010)
42. <http://www.icta.lk> (Accessed on September 14, 2010)