

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

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Abstract

Shilpa Sayura and 150 Nenasala Telecentres have enabled new forms of participation of rural youth in national education by creation of local language open learning environments in rural societies. This open development catalyzing the power of ICT has addressed rural education problems in an innovative way demonstrating how ICT4D could be used to develop education in rural societies. Shilpa Sayura and Telecentre social education model providing an alternative way for enabling a more inclusive access to national education in rural Sri Lanka is seen as an example of open ICT4D for shaping future societies.

This research studies open development approaches by rural Telecentres and findings include impact of local language open learning among rural youth and resulting performance changes and the role of social entrepreneurship in open development to enhance the understanding of new forms of participation created by deployment of local language open learning to inspire a discussion on "Open learning at Telecentres" to suggest that "local language open learning at Telecentres is an effective rural development instrument to help shaping of the future rural societies in the developing world" as a replicable social educational model and emphasize future research and development in this area in the spirit of building capacity with international and developing world partners.

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

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1.0 Introduction

Shilpa Sayura and 150 Nenasala Telecentres have enabled new forms of participation of rural youth in national education by creation of local language open learning environments in rural societies. This open development catalyzing the power of ICT has addressed rural education problems in innovative way demonstrating how ICT4D could be used to develop education in rural societies and emphasizes the impact of openness in the process.

1.1 Nenasala Telecentre Network

Nenasala meaning center for knowledge, is the brand name for community driven 600 rural Telecentres network aimed to reduce digital divide, develop culture and commerce and promote community integration are setup by Sri Lankan Information and communications Technology Agency (ICTA) under e Sri Lanka project in a 1000 Telecentres rollout plan. A Nenasala Telecentre is equipped with 3-4 computers, printer, webcam and a broadband internet connection are mainly four models (Table 1.0) and serves rural users with shared access to information and communication. The core area of this research is Uva province (Fig. 1.0) which has 60 Nenasala Telecentres.

1.2 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”. (Shilpa Sayura –Localized Self and Group e-Learning System for Handicapped Students in Remote, Rural communities of Sri Lanka, Meegamma, N, 2006).

Shilpa Sayura e learning system covers junior secondary level national curriculum in local language; piloted in 20 Nenasala Telecentres and replicated in 150 Telecentres by 2009 (Fig. 2.0) serving over 9000 students. “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., Meegamma, N., Mozelius. P., M-2009). The project has won several international ICT4D awards for its impact innovation and implementation.

1.3 The general context of education in rural Sri Lanka

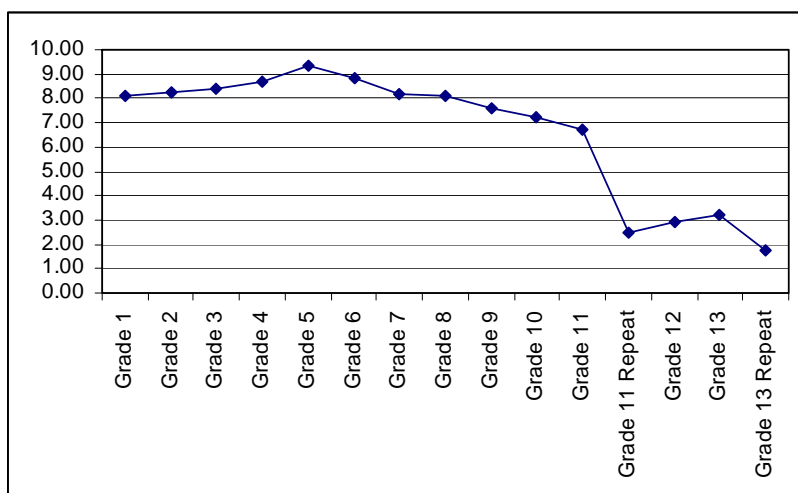
It is compulsory in Sri Lanka that all children attend school till age 14. The students who wish to pursue higher education must pass the General Certificate of Education (G.C.E) Ordinary Level (O/L) and study for another 2 years in G.C.E. Advanced Level (A/L) to sit for university entrance exams. The 9506 schools in rural Sri Lanka are maintained by the provincial government while 323 national schools are maintained by the central government.

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 societies one can observe that there are many disparities exist in access to education by rural societies.

1.3.1 Education issues in rural Sri Lanka

Based on statistics of the government in 2006 there are 9829 public schools, 561 Pirivena (Schools for Buddhist priests) and 80 private schools serving a total student population of 417921. Among them 7425 public schools (75.5%) having less than 1000 students are assumed as rural schools in this research (Table 2.0 and Table 3.0). The examination results in year 2006 (Table 4.0) shows that from 296358 candidates who sat for GCE (O/L) only 296358 (48.70%) were able to qualify for Advanced Level (A/L).

Early school drop-off is seen as a growing problem as shown in following graph derived from national students distribution by grade statistics in 2002 (Table 5.0) The number of students in grades starts to decline after the primary secondary education and becomes sharp drop after G.C.E O/L examination.



2.0 Aim

Aim of this research is to enhance the understanding on new form of participation created by local language open learning at Telecentres to find answers to following research questions.

1. What constitutes open learning at Telecentres?
2. How open learning has been deployed by Telecentres in rural societies?
3. How open learning enable new forms of participation in rural societies?
4. What impact and changes were resulted from open learning at Telecentres?
5. What are the possible risks of openness and how can we mitigate them?
6. Can open learning be used as a development instrument for shaping of future rural societies?

By answering above questions this paper hope to suggest that “local language open learning at Telecentres is an effective rural development instrument to help shaping of the future rural societies in the developing world”.

3.0 Methodology

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 open learning at Telecentre case studies. The data collected through Telecentre visits, interviews, questioners and observations during 2008-2009. Telecentre managers were interviewed to find how they approached open learning and what new forms of participation were resulted. A survey was conducted among students of 6 Telecentres to study the change of performance created through open learning at Telecentres. Group discussions were held at Telecentres involving students and their parents to find out rural education issues. Key persons of Shipa Sayura project were interviewed to find out how openness was used in Shilpa Sayura implementation. Shilpa Sayura e learning system was studied to find out its technical and pedagogical approaches to facilitate openness in learning. Informal discussions were held with teachers, parents and community leaders and Shilpa Sayura M & E reports were studied to understand the implications of open learning for the sustainability of Telecentres.

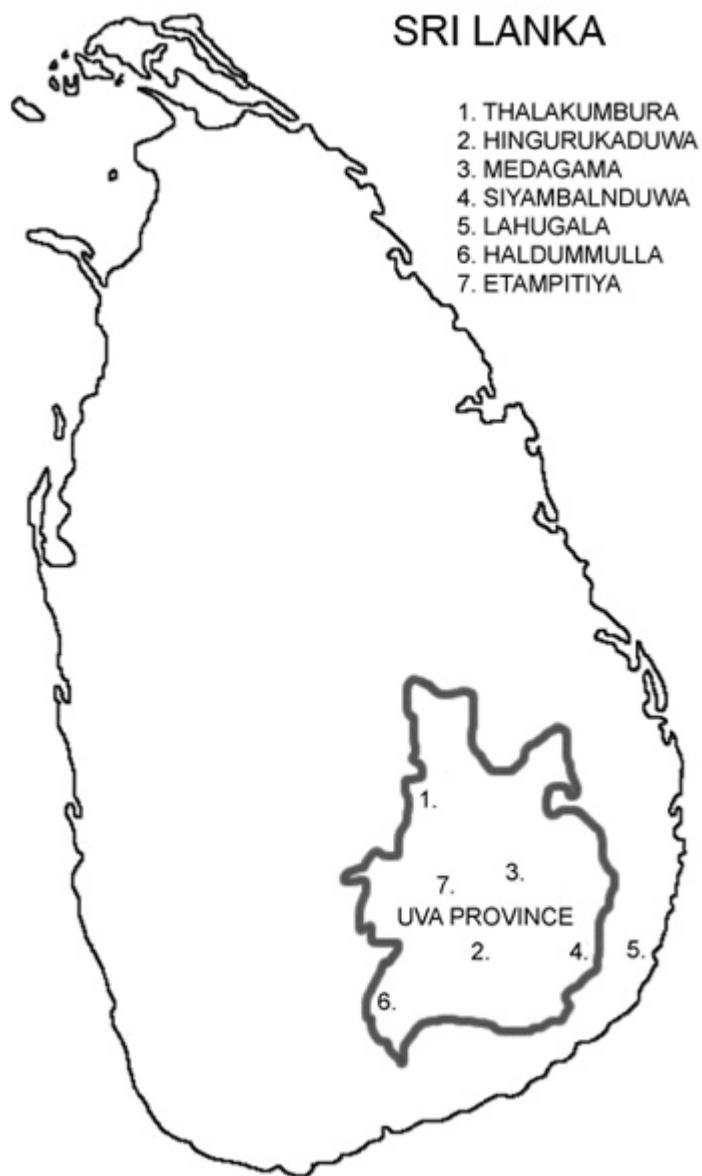
3.1 Questionnaire responses from Telecentres

Telecentre	Responses	Age	Gender	Language
Talakumbura	22	10,13,15,19,13, 12,10,12,15,14, 14,15,14,16,16, 15,13,15,13,14, 15,15	Female: 5 Male: 17	Sinhala : 22
Hingurukaduwa	21	15,14,14,15,14, 13,14,17,12,12, 14,15,12,12,11, 13,13,14,13,11, 12	Female: 11 Male: 10	Sinhala : 21
Nagala	22	15,15,15,15,15, 15,15,15,15,15, 15,15,15,16,15, 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, 11,12,11,13,11, 13,12,12,12,12, 12,12,12,12,12, 12,12,11,11,11, 12,12,12,12,13, 13,13,13,13,13, 14,13,11,11,11, 12,12,11,12,12, 12,12,11,11,11, 13,12,13,13,13, 11,11,11,11,11, 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, 13,13,14,14,14, 13	Female : 5 Male : 12	Sinhala : 7 Tamil :9
Etampitiya	20	14,15,15,14,13, 11,9,14,15,14,1 1,13,15,12,14,1 4,12,14,15,14	Female : 13 Male : 7	Sinhala : 10 Tamil :10
Overall	Total : 176	Median : 13	Female : 99 Male :77	Sinhala: 157 Tamil:19

3.2 Case studies Information

	Case	Data collection methods	Field studies by	Year
1	Open learning at Telecentre changes lives of young priests Talakumbura Telecentre	Interviews, Observations, Questionnaires	Niranjana Meegammana, Rasika Sampath, Keeriyagolle Dhammasara	2009
2	Open learning e village enables youth development Hingurukaduwa Telecentre	Interviews, Observations, Questionnaires	Niranjana Meegammana, Rasika Sampath	2009
3	Telecentre empowers rural students with open learning Madagama Telecentre	Interviews, Observations, Questionnaires	Niranjana Meegammana, Rasika Sampath	2009
4	Telecentre e School increases access to education Siyambalanduwa Telecentre	Interviews, Observations, Questionnaires	Niranjana Meegammana, Rasika Sampath	2009

Case study locations



All case Telecentres are located in rural villages in Uva province, Sri Lanka affected by high poverty. (Table 6.0)

4.0 Data & Analysis

In this section the survey data and case studies presented, discussed and analyzed.

4.1 Responses for Interviews and discussions

We interviewed 5 experienced Telecentre managers. The survey respondents were 176 students learning at the Telecentres with median age of 13 and studying in grade 8. All managers specifically expressed that their areas having a disparity in inclusion of the national education.

A Telecentre manager said that “Hingurukaduwa school lack trained teachers for ICT, English, Math, Science and even Art. As the transportation is very poor, teachers dislike working in our area. Students who can afford are moving out for education” (Interview 2.0). Another manager stated that “Math, Science and English are the weakest in our area. Due to the civil war many teachers transferred out of the area. We have a high failure rate in GCE O/L” (Interview 4.0). A Telecentre manager who is also a junior planning officer of local educational office said “Madagama living conditions are very harsh, therefore teachers leave very quickly (Interview 3.0). ” Another manager brought a new angle saying “During planting and harvesting times, students join agriculture work and miss many school days. They also can’t afford external tuition” (Interview 1.0). From the responses we found that there exist an access to education problem and an issue of getting good teachers to teach in rural areas. This social disparity seems to be influencing students to use open learning at Telecentres.

On the school drop off issue, Village headman of Thalakumbura said that “children who can afford a better school leave the village; children who stay tend to drop school early.” A female teacher from Haldummulla said that “many students fail G.C.E O/L examinations as our school doesn’t have adequate teachers for Science, Math and English”. She has been recruited as a primary teacher but made to teach Math, Science and ICT for grade 10 and 11. The teacher pupil ratio of Uva provincial schools to Uva national schools is 24.20 to 6.51. The respective national averages are 18.08 to 22.14 (Table 7.0). As the students per class are specified as 40 in general, we think unavailability of teachers is a more of a deployment issue rather than non availability of teachers. The effects of this factor are clearly evident from Uva province G.C.E O/L examination results in year 2006 (Table 4.0). “Poor education facilities in Uva province has caused poor examination results increasing early school drop offs and unemployed youth” (E3 - Framework for Telecentre Network Sustainability Development, Meegamma, N., e-India 2009) which may have influenced the development of open learning at Telecentres and roles of Telecentres in developing education in rural societies.

We found no restriction in Telecentre use for gender, age or ethnicity. Evaluating of gender access to open learning services we found that 54% of the respondents being females as a sign of empowerment of rural women through ICT4D. 53% of the students in Haldummulla and Etampitiya Telecentres being Tamil speaking community is a sign of communal harmony created by Telecentres. We observed

that an adult female e learning agriculture in local language and another unemployed female is learning art from Shilpa Sayura for learning dress designing. All Telecentres are opening 7 days a week unless there is a special holiday. The log books showed that Talakumbura Telecentre is operating from 6.30 AM to 10.30 PM and students were learning over night at Hingurukaduwa Telecentre. "I learn both art and music which is not possible in school" said a student. Another has improved Math by studying lower grade lessons and gradually developing to higher grade lessons using Shilpa Sayura. Telecentres enabling access without restrictions have enabled participation of rural youth in education seems to be resulting from openness in ICT4D.

The poverty in study area (Table 6.0) has not restricted access to learning by youth as subsidized and free services made available. Paying for learning is an innovative concept practiced by Hingurukaduwa Telecentre through a donor assisted micro scholarship program in addition to free use of Telecentre resources to encourage open learning. Sustainable agriculture education programs done in the night for farmers who are unable to visit Telecentres in day time is a "Significant contribution of Telecentres for including the rural people in the knowledge economy both directly and indirectly" (Critical Issues for e-Learning Telecentres in Sri Lanka and India, Gaiani, S., Hansson, H., Meegamma, N., Mozelius, P., M-2009) Therefore local language open learning enabled by Telecentres could be treated as an open development instrument for shaping future rural societies.

A Telecentre manager pointed out a new need of unemployed youth. "Technical collages are too far from village, if content is available unemployed youth can learn at the Telecentre, which confirms "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) brings out a new potential of open learning to provide vocational training for rural youth.

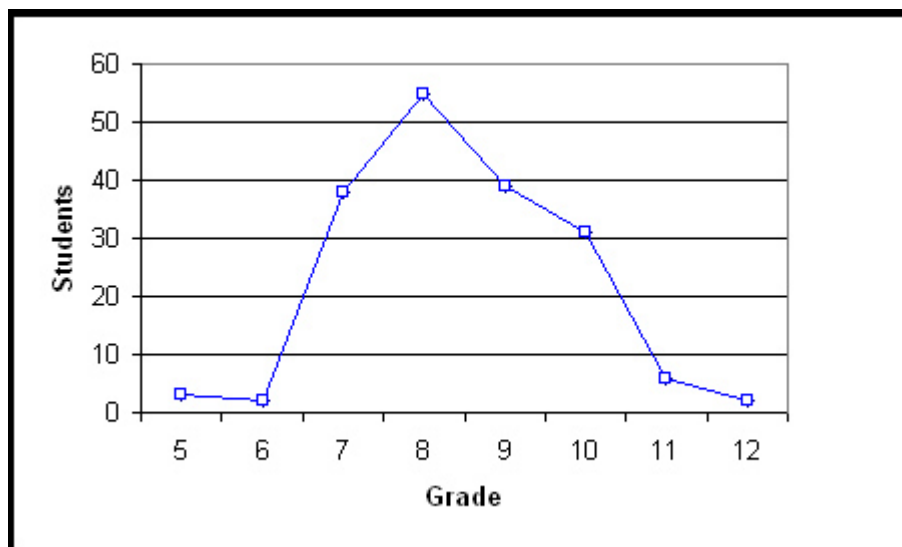
At the group discussions the parents agreed that "Telecentre is improving rural education". The expressions "My child has learn to speak in English", "My son is doing better in school now" and "my daughter aimed to be a computer teacher" reflect that open learning is enabling creation of new learning paths to careers not available to rural youth before. Hence "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) widens the scope of learning opportunities for rural youth with the openness created by ICT4D.

Answering the question "How does your Telecentre approach rural education development?", and "What special activities of your Telecentre has brought to your community?", Telecentre managers described unique open learning deployment approaches used to develop education in their community. They are presented in case studies of this paper.

4.2 Analysis of data from the questionnaire

The questionnaire for students (Form 1.0) included open questions on educational tools used and their preference of tools, how often tools are used? what is learned and how they are learning? including a comparison of Telecentre and school education. The questionnaire also asked about their achievements, obstacles and suggestions for improvement of open learning.

Student distribution by grade in the survey (Table 8.0)



Students learn at the Telecentre at an average of 8.4 hours per month. The median of 8.0 hours seems significantly a lower than urban and developed societies. They learn as a group sharing 3-4 computers. Shilpa Sayura, Azeem Premji, ICT learning CDs and Google images were main educational tools used. MS Encarta was used by only 2.3% and none of the respondents used Wikipedia as an educational tool although they are considered as a globally popular educational tools. All 75 students in Siyambalanduwa stating English language as their main obstacle shows the vital importance of local language to increase rural youth participation in open learning. 94% of Sinhala students choosing Shilpa Sayura and 95% of the Tamil students choosing Azeem Premji as their favorite educational tool proved that the local language tools are the preference for open learning 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

On the question of learning method, 67% stated that they do self learning and group learning and had a median age of 13 equal to the median age of the survey. The 8.5% do only self learning, are having a median age of 14 while those who do group learning only had a median age of 11. We think that there is a relationship on self and group learning behavior and age of the learners which need to be researched as such findings will help designing of open learning instructions and pedagogies to suit

age based learning methods.

Math (67.6%), Science (62.5%) and English (35.8%) were most learned subjects at the Telecentre and students taking external tuition for Math (34%), Science (16%) and English (20%) shows that they are the most demanding subjects in rural education. It is further confirmed with 63.18%, 57.37%, and 51.65% of the candidates failing Math, Science and English in G.C.E O/L examination in 2006 (Table 10.0). The young priests who did not take external tuition yet they were able to pass examination doing self and group learning. Hence we think that enabling of self and group learning in local language is creating increased opportunities for rural youth in the knowledge society.

All 176 students took part in the survey stated that “e content is better than text books is possible impact of open learning and confirms that future rural youth will prefer e content over text books. . We met students walking as far as 4 kilometers to Thalakumbura Telecentre showing increased interest in learning at the Telecentre. The students stated that self learning (29%) and extra learning (18%) as the main differences of the Telecentre (Table 11.0). They appreciated Telecentre for “e learning”, “easy learning”, “extra learning”, “further learning”, “more information than school”, “learning subjects not available in school”, “self learning”, “advanced learning”, “practical learning”, “learning on internet”, “using computers to learn” as advantages and described their positive experiences as “Interesting”, “easy” and “enjoyable” confirming that open learning at Telecentres is creating a significant impact among rural youth.

Students appreciated the facilities for repeat studying to improve the weak areas and support for school work hence we think that open learning at Telecentres is not competing but complementing the school education. Thalakumbura students saying “Telecentre was open when ever we wanted to learn” shows increased openness of Telecentre compared to government school in empowering learners which is resulting from open access to knowledge and serving of the different needs of the rural learners by providing alternative ways to increase inclusion in universal education.

Responding to question on their achievements of using Telecentres students stated that improving weak subjects (39.8%), using computers to learn (22.2%), learning ICT (6.3% (Table 12.0) as main achievements. Two students winning young computer scientist award, a female students becoming a runner-up in a national e design competition and another winning provincial software development competition are seen as significant achievements in the rural context.

Responding to the question on obstacles and improvements students stated knowledge of English, unavailability of Tamil & Pirivena curriculum as their obstacles extra to the limitations of ICT infrastructure. The improvements suggested by students were enhancement of content with more pictures, sounds & videos and adding extra subjects Including Tamil & Pirivena curriculum and increasing of learning time clearly shows their keenness in engaging in open learning more in future.

4.3 Open learning at Telecentre changes lives of young priests

Thalakumbura Telecentre situated in a temple is equipped with three computers facilitated e learning for 103 rural students by opening the Telecentre from 6.30 AM to 10.30 PM with volunteers help. Five young priests, who studied in the religious school Pirivena, could not sit for G.C.E O/L examination as their curriculum did not cover national curriculum hence deprived of their chances to enter senior secondary level leading to higher education. The five young priests engaged in self learning with Shilpa Sayura local language e learning resource at the Telecentre were able to pass G.C.E O/L national examination which enabled them to enter the path of higher education. "We prepared for the examination learning from Shilpa Sayura" said a young priest providing strong evidence on the change of performance through open learning at Telecentre.

"After the success of 5 priests, now more young priests are using Shilpa Sayura" said the head priest of Thalakumbura temple providing an evidence of how open learning increased participation of isolated rural youth in national education. The young male priests were a special group with different life objectives shared Telecentre equally with others, which may have helped knowledge sharing among different groups is an example of collaborative learning to make change of performances using new learning platform created by Shilpa Sayura and Telecentre to educate rural communities.

Impact of open learning at Telecentre

Shilpa Sayura and Telecentre combination creating an open learning environment helped five young priests to pass G.C.E. O/L examination. It improved their lives with the new opportunity created to enter advance education leading to higher education. Thalakumbura Telecentre which was non-operational became sustainable with Shilpa Sayura implementation (M & E Reports, e fusion pvt, 2008) and a useful education resource for the isolated youth community.

Challenges

Open learning at Telecentres requires enhanced content and technical support. Students needing increased learning time create infrastructure challenges. Rural communities although benefitted, are challenged with sustaining their Telecentres

with the free services model.

Lessons Learned

Shilpa Sayura is a useful local language open learning resource to improve rural youth education. Open learning at Telecentres can help increasing of isolated rural youth participation in national education. Openness in ICT4D can help serving of deep social needs of isolated communities like five young priests of Thalakumbura.

4.4 Open learning e village enables youth development

Hingurukaduwa is an isolated village facing education issues 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 donated by a well wisher in 2002. Their vision was to teach ICT and English to the village youth for creating an alternative path for youth development. Using the facility for Shilpa Sayura local hosting Telecentre enabled e learning at homes using donated computers. Each computer was shared by group of 5-6 students. The Telecentre conducted ICT & English for students on week ends. Hingurukaduwa Telecentre changed the model of students visiting the Telecentre by enabling open learning at homes to increase access to national education creating impact on students living far from the Telecentre. The 20 open learning groups are technical supported by youth who were first benefitted increased participation of the beneficiaries in development. A female student in grade 10 said “learning with Shilpa Sayura at home, I was able to improve my standing in the school tests”. At the group discussion the parents appreciated “learning enabled at homes” and “children are improving in school performance”. Computers and education services for students provided free of charge and a micro scholarship program implemented with donor assistance to encourage students to pursue ICT education. The Telecentre expanded their experiences into two more villages by setting up two more open learning Telecentres.

The Telecentre helped youth to develop ICT careers. A good example is a youth who could not study Science subjects in advanced level as the village school did not have capacity. Telecentre created him an alternative path with open learning. “While volunteering at the Telecentre, I used Shilpa Sayura to learn English and ICT” he said. After studying Art subjects in advanced level, a Telecentre scholarship helped him to study java programming and join Shilpa Sayura developer team and plans to enroll in a bachelor’s degree in ICT. Two Telecentre youth winning National Young Computer Scientist award in 2007 seen as remarkable achievement enabled by open learning in a rural setting and they too hope to become ICT professionals following an open learning path through the Telecentre.

Hingurukaduwa e village approached rural education development in a more open manner addressing local needs to increase participation of rural youth in national education. They used volunteering effectively for open development. The facilitation of group learning at homes and micro scholarship program helped empowering of

rural youth with education as well as learning ICT and English for developing of future careers to increase their career prospects.

Impact

Hingurukaduwa Telecentre by taking local language open learning to village homes created a new form of participation in national education by rural youth which helped improving of their education and created an alternative path for career development using open development.

Challenges

Increased demand has created a challenge for expansion of Hingurukaduwa e village hence the running a totally free services model is a challenge even with donor assistance.

Lessons learned

Implementation of group learning at homes enables new forms of participation in education by isolated rural youth. This model can be replicated in large scale to improve rural education and help rural youth to find alternative paths for career development. Social entrepreneurship is an important element in social innovations in open development.

4.5 Telecentre empowers rural students with open learning

Madagama is one of the highest poverty locations in Monaragala district which recorded only 34.08% pass rate in G.C.E O/L compared to national average of 51.3% in 2006 provides a clear evidence on status of poor education in the area. Although ICT was introduced in G.C.E O/L examination in 2006, local schools were not able teach ICT due to unavailability of trained ICT teachers. The G.C.E O/L ICT curriculum is a two year study in covering theory and practice in programming, number systems, logic gates, computer hardware, networking, computer security, internet, web designing, flash and ICT & society including office applications. The teacher in charge of ICT in school said, "Currently I am teaching only office applications to students" stating the knowledge constraint faced in teaching ICT curriculum. ICT is considered as an important subject by students evident from a student who said "I am learning ICT for future employment" seems a good reason that influence students to consider ICT as a subject for G.C.E O/L examination even in a highly constrained educational environment.

The manager of Nagala Telecentre situated 20 km away decided to address Madagama ICT education problem with open learning model used at Nagala

Telecentre. “Shilpa Sayura has all the content needed to teach O/L ICT”, he said. He started a Telecentre at Madagama bringing one of the three computers from Nagala Telecentre and partnered with an unemployed youth to share his personal computer creating a local employment opportunity. After an awareness session conducted in local school over 50 students and several teachers joined the Telecentre to learn ICT on G.C.E O/L curriculum. The Telecentre teaching ICT in local language increased participation of students and gradually developed them to learn ICT in English.

In August 2009 the “first group of students learned at the Telecentre took ICT subject in mid term test and improved their performance” said teacher in charge of ICT. 11 students passed ICT subject in GCE O/L examination in December 2009. One of the exam candidates said “We could learn ICT because of the Telecentre.” The Telecentre by facilitating open learning enabled new form of participation in national education is an example of open development in rural education.

The learning methods and approaches deployed by Madagama Telecentre were blended with self and group learning, class room teaching and instructor guided learning. Group sessions held at Telecentre to discuss and solve problems helped peer to peer learning. The Telecenter manager said “There was no need to give notes, students self learned at their pace in their own time”. Telecentre trained local teachers in ICT free of charge and provided study materials to use in school. “Telecentre created learning opportunities for students that were not available before” said principal of the local school. This open development is an example of potential of Telecentres to improve education in rural societies and also shows that collaborative partnerships can complement national education while increasing Telecentre sustainability.

Open learning Impact

The students of Telecentre improved performance in ICT subject in school and 11 students passing ICT in G.C.E O/L examination is a result of open development enabled by ICT4D. The Telecentre collaborating with local school increased learning opportunities and complemented national education by developing of local teachers to teach ICT.

Challenges

Students stating the need for learning ICT in local language seems a general need of rural societies which creates challenge in developing content using local language ICT terms as it requires wider community participation for acceptance of terms used.

Lessons Learned

Open learning at Telecentres can help enabling of new forms of participation by rural youth in national education. The collaboration of Telecentres and local schools complement each other in rural education development. The social entrepreneurship is a significant enabling factor in change of performance resulted in rural youth. This experience can possibly be replicated island wide Telecentres to enable teaching of ICT for national curriculum addressing lack of ICT knowledge in rural societies.

4.6 Telecentre e School increases access to education

Siyambalanduwa is one of the highest poverty areas in Uva province. The education constraints are reflected from 63.16% of the candidates in the district failing G.C.E O/L examination in 2006. "Failing O/L exam is a burning issue in our community" said the head priest of Siyambalanduwa Temple. The Telecentre started in 2006 was closed down due to lack of community participation and re-opened in June 2008 with the introduction of Shilpa Sayura e learning. The Telecentre facilitating open learning for Math, Science and ICT created new learning opportunities for the village youth. "I have improved my Math using Shilpa Sayura" said a girl learning at the Telecentre. Among 102 students learning at Telecentre 80 students (78.4%) passed G.C.E O/L in 2008, which is a significantly a higher rate than 36.84% pass rate recorded in the district in 2006, is seen as a change of performance resulted from open learning at the Telecentre.

Learning English was constrained in the area due to non availability of English teachers. Telecentre obtaining the service of a volunteer located 250km away in Colombo enabled learning English using Skype. "Learning on Skype helped me speaking English" Telecentre manager said. Taking this experience further the Telecentre started conducting online Math and Science lessons to an isolated group of students in Lahugala Telecentre 20km away. The collaborative partnership between two Telecentres helped the isolated youth group to improve their knowledge and pass G.C.E O/L examinations and created revenue to Telecentres increasing their sustainability. This case provides an example of open development to increase participation of rural youth in national education. The open learning approaches deployed by Telecentre were blended with self and group learning, class room teaching and distance learning using of local language e content at the Telecentre.

Open learning Impact

Siyambalanduwa Telecentre has become sustainable with open learning introduced by Shilpa Sayura which transformed the Telecentre to a form of an e school increasing participation of rural youth in national education. The learning on Skype has connected distance communities with knowledge sharing enabling a new form of

participation enabled by ICT and new learning opportunities created by Telecentre helped improving of the education of isolated rural youth.

Challenges

Knowledge of English is a barrier for rural youth in using internet for learning and infrastructure limitations restrict the participation of youth needing access to open learning.

Lessons learned

Shilpa Sayura can be used to help improve the sustainability of Telecentres. Local language open learning help increasing of participation of rural youth in national education. Collaborative partnerships made between Telecentres open new possibilities that increase inclusion of excluded communities in education providing innovative solutions addressing lack of teachers. The role played by the committed individuals increases the impact of open development.

5.0 Discussion

5.1 Open Learning at rural Telecentres

As demonstrated in four case studies, Telecentres by creating open learning environments with local language educational resources enables increased access to national education by rural youth without gender, age, ethnicity and economic restrictions which provides a new ways of participation in education seems a result of open development enabled by ICT. The free and subsidized access to learning services and micro scholarships encourage rural youth to engage in learning despite their economic conditions. A learner saying “Telecenter was open when ever we wanted to learn” is a self expression of openness experienced at the Telecentre. The responses to survey question on difference of Telecentre to school clearly shows that digital content powered Telecentre is more open and inclusive in rural education development.

5.2 Digital Content and technologies for open learning

Shilpa Sayura e learning system embedded with over 8000 local language lessons for learning 12 subjects for national curriculum enables creation of unique open learning environments in Telecentres to increase rural youth participation in national education. The concept of hosting the system in the local network allows local adaptation is a result of openness in technical design to increase participation which has helped delivering knowledge to village homes. The national curriculum based lessons and self testing facilities helped students in exam preparations. The facilities for shared home work creation, content bookmarking seems to engage learners in continues learning activity. The lessons ranging from simple to advance knowledge opens learning to beginners. The 200,000 Sinhala – Tamil, and English dictionary

facility helps searching of Google.com with local language keywords opened access to widely available English content on internet by local language users. The content licensed on public domain and creative commons increases the re-use and sharing. Students stating that “e content is better than text books” seems to be a result of openness of content and “technology can facilitate learning by providing real world contexts that engage learners in solving complex problems (Duffy & Cunningham, 1996; Honebein, 1996; & Cognition and e Technology Group at Vanderbilt, 1992). The teacher participation in Shilpa Sayura evident in design of curriculum, content authoring and review process. A virtual teacher singing a “Hindustani Raga” for students to follow and training on web designing by a virtual tutor enhances participation by best teachers in rural education development using “ICTs may be of use to enhance education of the poor. Informal education, developing functional skills, matters as much if not more than formal education” (Towards Universal Primary Education, special issue of Mainstreaming ICTs, OWSA, Vol. I/no. 2, 2004). The content, technology and deployment strategies in case studies are creating new modes for rural youth participation in national education is a significant impact of using ICT for open development.

5.3 Local language impact in education innovation

Use of local language content and technologies has been the key approach of open learning deployed by Telecentres. The learners choosing local language educational tools as their favorite, proves that the local language is the preference of rural youth for learning. It's a challenge developing local language technologies and content with the pace of changing knowledge. Adult communities using local language content in Agriculture and Art can be seen as an important strategy to make them participate in knowledge society. “The use of local languages for instruction often leads to inclusion of more local content in the curriculum and greater participation” (World Bank, In their own language ... Education for all, 2006). We also see that Local language ICT can enable rural society's equal participation in global concerns of developing sustainable agriculture, renewable energy, women empowerment and democracy. Hence we suggest local language open learning to be considered as an open development platform for shaping future rural societies.

5.4 Self and group learning for open development

As found in the survey, self and group learning has been the main open learning approach "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) where each individual takes the responsibility of own learning is enabling new form of participation in knowledge society. Telecentres by engaging students in a self and group learning provides an alternative means of education addressing problems in rural education. This process modifying the learning behaviors of rural youth enabling learning on a self determined time and space with content and pedagogies designed specifically with "learner-centered strategies" (The Design of Effective ICT-Supported Learning Activities: Exemplary Models, Changing Requirements, and New Possibilities, Cameron Richards, 2005). Math practice using interactive java and flash animations are best examples for self learning pedagogies. The collaborative group learning concept is pro-active and complements reactive learning in classrooms. The self testing and feedback pedagogies use concepts of "drill and practice often used in some gaming techniques for encouraging participation and motivation" (The evolution of ICT-based learning environments: which perspectives for the school of the future?, Rosa Maria Bottino) enhances effect of self and group learning. Self and group learning in a social environment could be quite informal where observing others, trial-and-error, and group activities can help creation of new knowledge among group. Hence the self and group open learning as shown in case studies increases freedom for self-determination and learner independency in open development of rural education which can help shaping future rural societies.

5.5 Digital Content for increasing education participation

Students stating "e content is better than the text books" is positive response encouraging ICT enabled development but also challenge ensuring of author rights, anti plagiarism and authenticity emerging issues in electronic content that can be easily modified, shared and distributed. In this context Cape Town open Education Declaration, 2008 stating that "everyone should have the freedom to use, customize, improve and redistribute educational resources without constraint" is a worthy of consideration, however the local regulations, individual beliefs, user needs and economic reasons can possibly restrict true implementation of open content concepts. The openness in e content is also dependent of purpose, user and author as "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). Therefore open development may not be able to enforce open content policies restricting authenticity, creative rights and entrepreneurship. However in terms of mass scale replication of education innovations can significantly benefit from open content.

5.6 Role of partnerships in open development

As demonstrated in four case studies collaborative partnerships lead to "more positive social outcomes" (Open ICT4D, 2009) in human development. The open development of Shilpa Sayura involved a process of contracting, software & content development, review, implementation, support and capacity building, learning deployment and evaluation with collaborative participation of government, private sector and community to "achieve the developmental goals of poverty alleviation"

(open ICT4D, 2009). The funding provided to private sector by government through the World Bank loan helped initiation of the process. The private sector ICT expertise and Telecentres access to rural communities well bridged helping of creating values for each other and a shared vision of development. The government financing and monitoring helped keeping the project focus, however the bureaucratic processes had created constraints in handing designs and implementation gaps. Hence we think partners having upper hand in financing and evaluation require consideration of ground conditions and ease conditions for enabling innovation. Forming of Shilpa Sayura Foundation as a ownership shared entity formed by participants seems a best practice for sustainability for making development more open and transparent making “fundamental changes to organizational processes and structures” (Open ICT4D, 2009) which increased sustainability of the development and winning of Singapore Lien I3 Challenge by Shilpa Sayura Foundation is an example that open participation approach is welcome by funders.

5.7 Social entrepreneurship for open development

It is evident from case studies that the roles played by the social entrepreneurs have made a significant impact in open development and the inspiration for leadership seems to have emerged from the openness to adapt local development addressing specific needs of their community. Therefore we think that social entrepreneurship as an essential element in open development.

5.8 Challenges and opportunities in open learning

Local language open learning for rural communities is challenged with ever increasing and changing user needs resulting from changes in the national curriculum requires continuous review and updating of content. Improving self and group learning requires continues enhancing of instructions and pedagogies in content and maintaining of local support structures for re-deployment of updates. As stated in the survey students needing more learning time requires upgrading of Telecentre infrastructure. The donor assisted development model requires consideration of local revenue generation for sustainability, however generating revenue from low income rural societies is still a challenge for Telecentres.

From the case studies we see that local language open learning at Telecentres as an emerging branch of open education and a unique social educational development model which can enable new opportunities for rural youth to participate in national education. This model can be further enlarged by inclusion of adult learning in the on the areas of sustainable agriculture, community health, women empowerment, environmental conservation and economic development in rural societies. Youth vocational training is potential area for open development for increasing employment prospects. Hence open learning experiences of rural development can be scaled up and replicated in large scale for making a real difference in education in rural societies.

5.9 ICT4D and Openness for Social Innovation

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 relating to the context of human development is more meaningful with the inclusion and participation opportunities created by openness. Future ICT4D can be considered as a platform for rural development which “designs around the specific resources, capacities and demands of the poor... as the platform for development” (ICT4D 2.0, Richard Heeks, 2009) where the innovation shall emerge from practical application of development ideas, rather than theory it self.

Peter F. Drucker defines Innovation as "change which creates a new dimension of performance." evident from open learning case studies which created the change and performance improvement of rural youth in a new dimension where strategy, skills, values, systems and structure collectively and openly influenced the development process. Hence we think openness in ICT4D can create new perspectives of technology and processes for innovating new forms of participation to address education issues through social innovation.

5.10 Determining scale of openness in ICT4D

“Openness is not a binary concept; it is scalar” writes Open CT4D, 2009. The scale of openness in ICT4D helps ensuring of transparency which leverages early identification of “gaps in design and reality to make iterative changes in a flexible manner” (ICT4D 2.0, Heeks, 2009) in open development to improve the impact.

The operating platform choice of Shilpa Sayura has been influenced by Microsoft Windows used by all Telecentres and satisfactory Unicode support for local languages. The economic arrangements with authors, developers and teachers has influenced the openness in content which agrees with the argument "given different developmental contexts and that there will undoubtedly be trade-offs between competing interests and values" (Open ICT4D, 2009). Therefore we think the scale of openness in ICT4D is dependent of following operating parameters and their variations.

	Parameter	Variations
1	Ownership	Public, Private , Non Profit, Community
2	Partnerships	Public – Private - Community Public - Non Profit - Community Public - Community Non Profit - Community Private - Community Community – Community Non Profit - Non Profit

3	Technology	Proprietary, Open, Mixed
4	Sharing	Public Domain, GNU GPL, Creative Commons, Open Content, Restricted
5	Legal	Privacy, Confidentiality, Security
6	Resources	Time, Cost, Existing Systems

The scale of openness of the process is dependent on the ownership and partnerships while technology choices need to be made to simplify the implementation, bringing convenience to users, making operational and maintenance ease where cost effectiveness possibly compromise of the openness..

5.11 Risks of openness and mitigating them

increased openness although enables sharing and re-use of content, possibly loose the authenticity and intellectual rights on the way. It's also not possible to know whether content could be improved or made worse in an editing process. Hence the process of content creation needs to review for such concerns. Openness in Telecentres makes some students to deviate from school education due to increased gaming and social networks participation as well ass access to explicit content in an open environment creates local cultural issues. Hence local restrictions on openness may be made at Telecentres for social and cultural reasons.

Openness creates different perfectives on development due to diverse socio-cultural, economic and political backgrounds of participants which restrict negotiation to create of a common agenda for development. Enabling increased openness in participation leads to conflicts as “the decision to adopt the participation strategy is that it threatens existing hierarchies. (Scale-up, Presentation at the GKP South Asia Regional Meeting: Wijayananda, J., 2004). Hence require creating awareness of the development objectives and agreements of strategies by participants.

6.0 Conclusions

Local Language educational resources at Telecentres help creation of open learning environments in Telecentres for enabling new forms of participation in national education by isolated rural youth resulting improvement of rural education and performances in national examinations.

Local language e content shall be the preference of future rural youth; hence increasing of efforts in local language content development can help improve rural education for transforming of developing world.

More openness can help increasing of participation enabling creation of collaborative partnerships for open development in which ownership sharing by participating community has a significant impact on increasing sustainability.

Increased openness may result possible issues in diverse socio-cultural, economic and political environments which can be mitigated with the local adaptation of openness considering local socio-cultural needs and enforcing some restrictions of openness.

Local language open learning at Telecentres is seen as an emerging social education model which can be developed as an effective rural development instrument replicable at large scale for shaping future rural societies. Hence further research and development is emphasized in the spirit of building capacity with international and developing world partners.

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Table 1.0

No	Model	Owned by	Percentage
1	Temple	Chief priest of the village temple	47%
2	Community Based Organization	Organization officials	18%
3	Non Profit Organization	Organization officials	15%
4	Private	Private individuals	20%

Source: Needs assessment report, e fusion pvt ltd, 2008

Table 2.0

Schools and Student Distribution in Sri Lanka

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

Table 3.0

Provincial Schools Distribution 2006

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

Table 4.0

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 5.0

National Student Distribution by Grades in 2002

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

Table 6.0

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

Table 7.0
Teacher and student ratio of Sri Lanka and Uva Province

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

Source : Statistics Department of Sri Lanka

The Uva province poverty head count and teacher & student ratios are well below national averages.

Table 8.0
Students distribution by Grade in the Survey

Grade	Students
5	3
6	2
7	38
8	55
9	39
10	31
11	6
12	2

Table 9.0
Subjects learnt by students

Subject	Students	%
Math	119	67.6
Science	110	62.5
English	63	35.8
History	37	21.0
ICT	32	18.2
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

Table 10.0

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
11	Buddhism	193585	82.25	159224	34361	17.75
70	History	72905	56.62	41279	31626	43.38
71	Geography	73383	60.64	44499	28884	39.36
78	Agriculture	96671	73.49	71044	25627	26.51
47	Sinhala Literature	62064	62.79	38970	23094	37.21
54	Music(S)	50158	63.56	31880	18278	36.44
73	Health & Phy. Education	182403	91.13	166224	16179	8.87
81	Business Accounting	78882	81.44	64242	14640	18.56
98	Home Economics	54173	73.44	39785	14388	26.56
48	Tamil Literature	31140	57.15	17797	13343	42.85
52	Dancing(S)	52091	83.07	43272	8819	16.93
22	Tamil Language & Lit.	49748	83.4	41490	8258	16.6
64	Sec. Language(S)	12274	47.7	5855	6419	52.3
72	Development Studies	38484	87.8	33789	4695	12.2
46	English Literature	16082	71.2	11450	4632	28.8
55	Music (C)	11258	66.5	7487	3771	33.5
12	Saivism	26685	86.03	22957	3728	13.97
16	Islam	20239	86.19	17444	2795	13.81
97	Ele. tech.	5410	70.94	3838	1572	29.06
95	Mechanical Technology	5071	72.55	3679	1392	27.45
90	Construction Tech.	6131	81.63	5005	1126	18.37
65	Sec. Language(T)	2152	48.98	1054	1098	51.02
79	Horticulture	6479	83.39	5403	1076	16.61
96	Arts & Crafts	3564	77.97	2779	785	22.03
14	Catholicism	16561	95.95	15890	671	4.05
57	Drama & Theatre	12193	94.8	11559	634	5.2
53	Dancing (B)	2452	78.71	1930	522	21.29
63	Arabic	754	63.53	479	275	36.47
15	Christianity	2465	91.32	2251	214	8.68

76	Japanese	381	45.41	173	208	54.59
56	Music (Western)	2064	90.6	1870	194	9.4
68	French	296	46.96	139	157	53.04
92	Shorthand & Typing (S)	192	42.19	81	111	57.81
88	Marine Bio Res &Tech.	620	88.23	547	73	11.77
35	Construction Tech.	308	77.6	239	69	22.4
36	Electrical & Elec. Tech.	122	65.57	80	42	34.43
40	Food & Dress Designing	383	89.56	343	40	10.44
38	Home Garden. Tech.	391	90.54	354	37	9.46
61	Pali	146	80.14	117	29	19.86
49	Arabic Literature	132	81.06	107	25	18.94
62	Sanskrit	55	58.18	32	23	41.82
77	German	27	37.04	10	17	62.96
89	Food Science & Tech.	130	88.46	115	15	11.54
37	Mechanical Tech.	106	85.85	91	15	14.15
75	Hindi	44	68.18	30	14	31.82
39	Creative Arts	201	96.52	194	7	3.48
93	Shorthand & Typing (T)	16	87.5	14	2	12.5

Source: Examination Department Sri Lanka

Table 11.0

The difference of Telecentre to the school

Difference	Responses	%
Self Learning	51	29.0
Extra Learning	33	18.8
Interesting	27	15.3
E Learning	20	11.4
Enjoyable	17	9.7
Easy Learning	8	4.5
Internet	7	4.0
Repeat learning	7	4.0
ICT Education	5	2.8
More information than school	5	2.8
Practical Learning	5	2.8
Advance Learning	3	1.7
Learn subjects n.a in pirivena	2	1.1
Improving Knowledge	1	0.6

Table 12.0

Achievements of visiting Telecentre

Achievement	Students	%
Improve Weak Subjects	70	39.8
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
Practical Learning	2	1.1

Figure 1.0

Shilpa Sayura Operating Telecentres

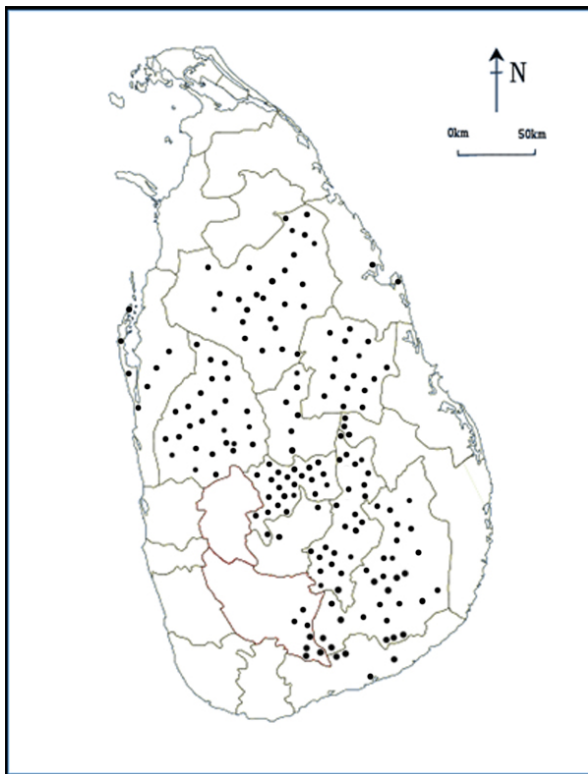


Figure 2.0



Interviews and Survey Data : www.Shipasayura.org