Activity Report

as JICA Senior Volunteer ICT

April, 2014 - February, 2015

Kenichi Tezuka
JICA Senior Volunteer ICT

2015. 01. 23 Ver. 1.1

T a b l e o f C o n t e n t s

1. TOR (Terms Of Reference)

Terms of Reference for me during this term is shown below ;

Terms of reference for JICA ICT Senior Volunteer

1. Empower teachers and lecturers on instructional technologies
2. Help schools setup learning management systems
3. Advise schools on internet management for schools
4. Help ICT teachers develop school websites
5. Assist the regions to setup Teacher Resources Development Centres (TRDC) / ICT centres
6. Advise teachers on issues of troubleshooting, repairs and maintenance
7. Help in the development of ICT in Education strategy documents and action plans for Swaziland
8. Advise on seeking support from international donors (especially Japan / JICA), government and local communities on financing ICT education
9. **Help in taking stock of old computers in schools [especially those that were donated by the Computer Education Trust (CET)] that are non functional and check whether these need to be disposed of or can still be used**
10. **Assist in the syllabus development process of the ICT Panel for both primary and junior secondary levels**
11. **Assist in the set up of an ICT Panel Centre**
12. **Participate and make presentations at ICT Teachers' workshops**
13. **Assist in the networking of 40 schools' (10 in each region) computer labs**
14. **Provide technical assistance to some of the Ministry's outstations e.g. REO offices, NCC, tertiary institutions, etc**
15. **Undertake further duties as may be required in consultation with the Senior Inspector – ICT**

The items shown in previous page has 15 items. Among them, No.1 to No.9 are the same items which were the TOR in the last term(July, 2012 – June, 2013). And items from No.10 to No.15 are new ones for this term (April, 2014 – Feb. 2015).

TOR shown by Mr. Tsela, Senior Inspector ICT, who is my counterpart, had 15 items and I told him that my term was only 10 months which must be too short to complete such numbers of items. So I asked him to select items necessary to treat urgently and give priority to these selected items.

Mr. Tsela showed me selected and prioritized items shown below.

Priority	Item in TOR	Reference No. in Page 1
1	Assist in the networking of schools' computer labs	13
2	Participate and make presentations at ICT Teachers' workshops	12
3	Assist in the syllabus development process of the ICT Panel for both primary and junior secondary levels	10
4	Help in taking stock of old computers in schools [especially those that were donated by the Computer Education Trust (CET)] that are non-functional and check whether these need to be disposed of or can still be used	9

2. Monthly activities

2-1 May, 2014

Month	Day	Week	School	Region	Investgate	Work	Workshop
5	6	Tue	Ejubukuweni High	HHOHHO	○		
	9	Fri	Elangeni High	HHOHHO/Ezulwini	○		
	13	Tue	Hawane High (JICA)	HHOHHO/PiggsPeak	○		
			Londunduma High	HHOHHO	○		
	16	Fri	Lobamba High	HHOHHO	○		
			Lomdzala High	HHOHHO	○		
			St. Mary's High	HHOHHO	○		
			St. John Bosco High	HHOHHO	○		
			St. Anne's High	HHOHHO	○		
			Mbekelweni High	HHOHHO	○		
			Lozitha High	HHOHHO	○		
			Manzini Nazarene High	MANZINI	○		
			Nhlambeni High (JICA)	MANZINI	○		
			Somjalose High	HHOHHO/Ezulwini	○		
	23	Fri	NyetaneHigh(JICA)	LUBOMBO	○		
	26	Mon	Mhlathane High	HHOHHO/PiggsPeak			○
	27	Tue	St. Marks High	HHOHHO/Mbabane			○
	28	Wed	EverynBaring Primary	SHISELWENI			○
	30	Fri	Manzini Nazarene High	MANZINI			○

In May 2014, we started to investigate PC Labs in high schools.

I'd like to show one case where a typical problem in ICT Lab. in high schools;

This school has a PC Lab. which has more than 30 PCs and 7 tables, which has a pipe to the ceiling. PCs on each table have network cable going up to the ceiling through the pipe and connecting to a HUB in a network box in the admin room. So it seemed to me everything was prepared to work with local network, but ICT teacher in the school told me 'Our network doesn't work'.

I checked the network box, and found that there was no power supply to the network box, and there's only one HUB but no Router in the network box.

This case shows that **ICT teachers must have basic skills to check his/her PC Lab.**

Here's another typical case with problems;

This school has some PCs for N-Computing. These PCs which controls monitors for N-Computing are connected to one Server machine running on Windows Server 2003. ICT teachers there don't know the password to login to the server machine, so once they shut down the server, they can't start the server machine. ICT Teacher who has set up the server machine has already moved to other school and there's no document about the server configuration and current ICT teachers didn't get any information from him.

The server machine doesn't work any more.

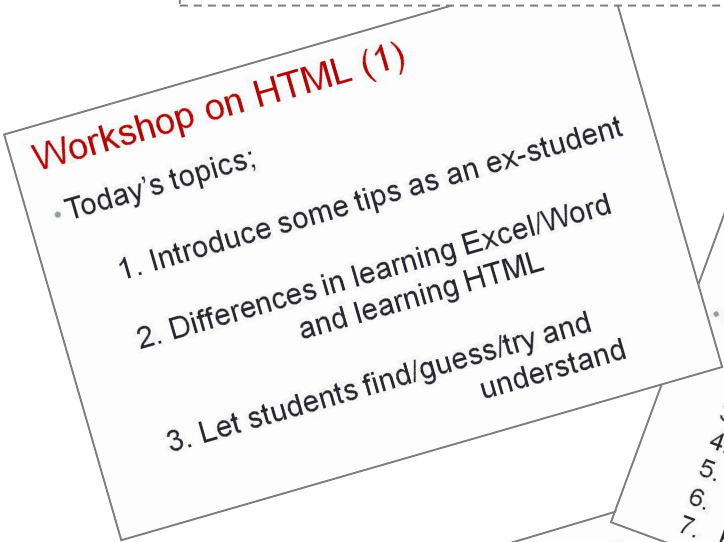
This case shows us that **there's lack of succession of important information by documents among ICT teachers.**

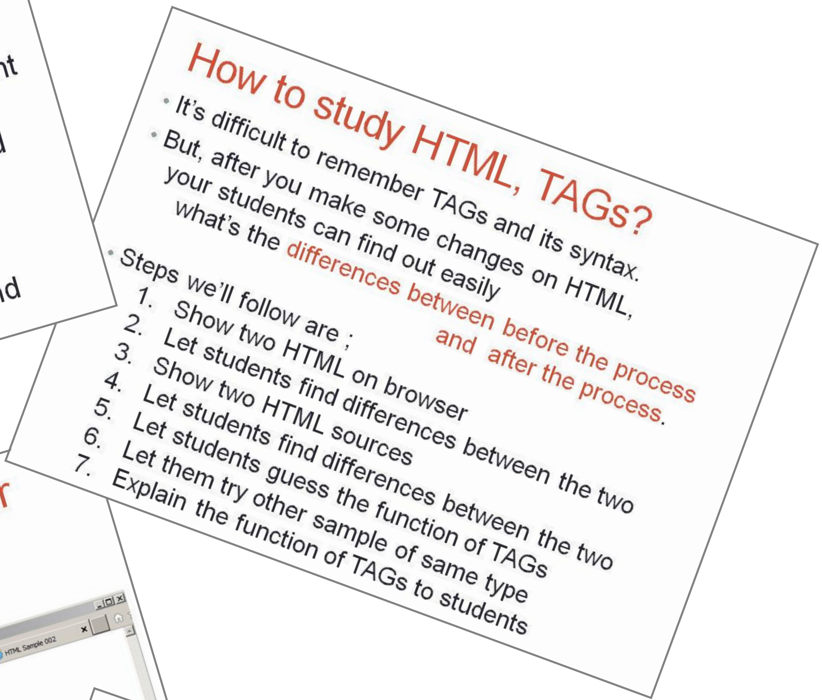
ICT teacher needs to have an ability to check current state of PC Lab. in his/her school.

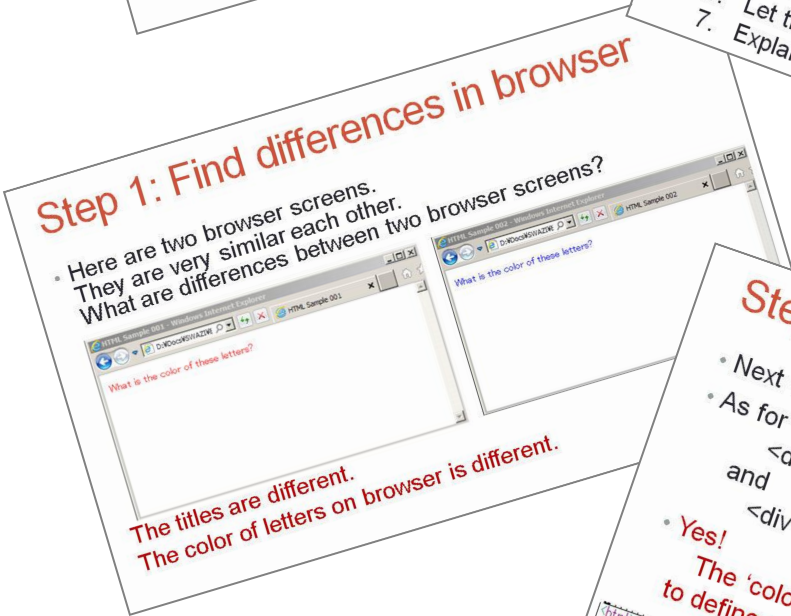
From 26th May to 3rd June, I participated in a workshop at various places in the country (PiggsPeak, Mbabane, Nhlangano, Manzini, Siteki and BigBend).

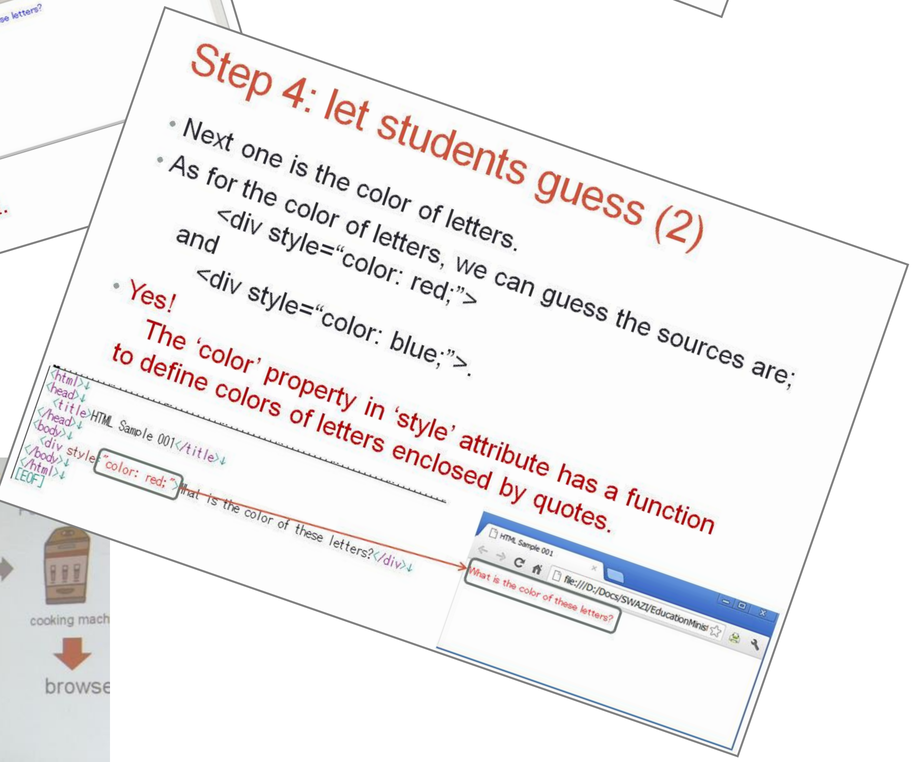
In the workshop, I talked about how to teach HTML in the classroom.

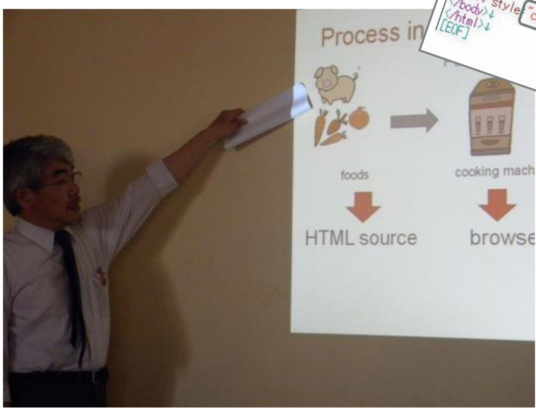
In the previous term (July 2012 – June 2013), I met many ICT teachers who told me that HTML is difficult to teach and for students it’s difficult to study. So I showed ICT teachers at the workshop about what are the differences between to teach/learn WORD/EXCEL and HTML and then I showed some hints on how to teach HTML to beginners from the point of ICT engineer’s view.











2-2 June, 2014

Month	Day	Week	School	Region	Investgate	Work	Workshop
6	2	Mon	Siteki Nazarene High	LUBOMBO			○
	3	Tue	U-TECH High	LUBOMBO			○
	6	Fri	Masibekela High (JICA)	HHOHHO	○		
	9	Mon	Somjalose High	HHOHHO/Ezulwini		○	
	10	Tue	Mpaka High	LUBOMBO		○	
	11	Wed	Mpaka High	LUBOMBO		○	
	12	Thu	Mpaka High	LUBOMBO		○	
	13	Fri	Mpaka High	LUBOMBO		○	
	16	Mon	Mpaka High	LUBOMBO		○	
	17	Tue	Somjalose High	HHOHHO		○	
	18	Wed	Somjalose High	HHOHHO		○	
	23	Mon	Thokoza Centre	HHOHHO・Mbabane			○
	24	Tue	Thokoza Centre	HHOHHO・Mbabane			○
	25	Wed	Thokoza Centre	HHOHHO・Mbabane			○
	26	Thu	Thokoza Centre	HHOHHO・Mbabane			○
	27	Fri	Thokoza Centre	HHOHHO・Mbabane			○

Mpaka High School

We started to set up local network in PC Lab. for high schools in the country.

In June 2014, target schools are ;
Mpaka High School in Lubombo
Somjalose High School in Hhohho/Ezulwini

Pupils are trying to measure length of a cable.

After I taught how to make network cables, pupils are trying to make cables.

Girls are cleaning the Lab.

Boys are bringing PCs into the Lab.

Teachers and pupils are setting up PCs and connecting them to local network.

We put a wood panel on the wall to fix our HUB on it.

Somnjalose High School

This school has already set up local network in the PC Lab. Each table in the Lab. has trunking pipe to the ceiling with network cables, which are connected to the 24 port HUB in network box in the administration room. What's problem here? Everything seems going well, but ICT teacher told us 'We can't use network'.

I checked the PC Lab., found that there's no power supply to the network box in the administration room. There's no Router there, too. Without Router, we need to give fixed IP address to each PC, which may cause problem to manage IP addresses, or we need to set up DHCP server on some PC, which also may cause trouble in future days. It may be the best to put a Router and use DHCP function for managing IP address.

PC Lab. in Somnjalose High.

The school has bought these equipment, a Router ,some cables and 8 port HUB.

Router is set under the network box in the Administration room.

30 PCs for pupils are connected to the local network, and administrator's PC in the admin room is connected, too.

One printer is connected to the administrator PC and shared in the network.

One shared folder is set up on the administrator's PC and shared with all PCs.

Workshop at Thokoza Centre (23 June 2014 – 27 June 2014)

We had a workshop for ICT Syllabus development at Thokoza Centre.

2 groups had discussion on ICT Syllabus for Primary level and Junior Secondary level.

Mr. Tsela, Senior Inspector ICT, gave a starting address and Mr. Hlophe, NCC, led the discussion as an excellent facilitator.

2-3 July, 2014

Month	Day	Week	School	Region	Investgate	Work	Workshop
7	2	Wed	NCC(National Curriculam Cebtre)	MANZINI	○		
	3	Thu	NCC(National Curriculam Cebtre)	MANZINI		○	
	8	Tue	Gilgal High	LUBOMBO	○		
			Siteki Nazaren High	LUBOMBO	○		
	9	Wed	Nokuthula High	MANZINI	○		
			Sivobu High	MANZINI	○		
			Ndwandwe High	MANZINI	○		
			Mankayane High	MANZINI	○		
			St. John Bosko High	MANZINI	○		
	１０	Thu	PiggsPeak Central High	HHOHHO/PiggsPeak	○		
			Ntsinini High	HHOHHO/PiggsPeak	○		
			Maywane High	HHOHHO/PiggsPeak	○		
	１１	Fri	Mabhensane High (JICA)	LUBOMBO	○		
	２１	Mon	Sigcaweni High	LUBOMBO	○		
			Sibusisuweni High	LUBOMBO	○		
			Mabondvweni High (JICA)	LUBOMBO	○		
	２４	Thu	Nokuthula High	MANZINI	○		
	25,28～31		Transport Problem				

In the workshop from 26th May to 3rd June, we asked participants, ICT teachers and head teachers, whether they are interested in local network development at their PC Lab.

We can offer technical support for such requirement to develop local network in schools, but for getting our technical support, there is one condition, which is that **schools who want our technical support should fund for necessary equipment for themselves**, for example, network cable, Router, Switches and other tools.

We estimated the cost roughly for typical case
typical case may have 30 PCs with Router and switches,
for wired network, 300m UTP cable, (trunking of cables is not included)
for wireless network, USB network adaptor for each PC and one Access Point ;
for wired network, it may cost around E7,000 to E10,000,
for wireless network, it may cost around E10,000 to E15,000

In spite of such condition, teachers from 43 schools showed us their interest on local network development.

In July, we visited some of these schools who were interested in local network development.

Sibusisweni High : This PC Lab. is necessary to be supported.
They have a 24 port HUB and PCs are connected by cables, but local network doesn't work.
PC Lab. has other problems, some traces of leaks and holes on the ceiling.

PCs seem to be well managed.

Holes on the ceiling.

Traces of leaks.

Sigcaweni High : This PC Lab. is also necessary to be supported.
They have a 24 port HUB and PCs are connected by cables, but local network doesn't work.
They have 17 new PCs, but they are still in packages.

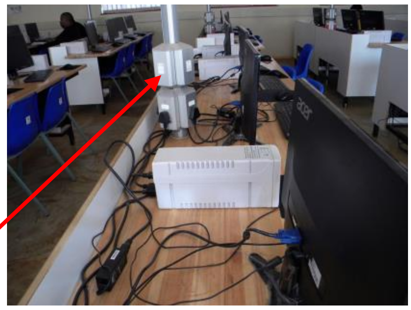
Many old type PCs.

24 port Switch, but doesn't work..

New PCs are kept unpackaged.

Mabondvwenii High : One of 12 JICA schoo (*)l.

Switch board on the wall



Modular jack for network cable,Jack is ready.
Inside the pipe ,power supply cables are ready, but there's no network cable. All JICA schools have the same state.

(*) 'JICA school' means 12 schools which JICA has supported to found with financial aid.
Each JICA school has a PC Lab., which has a trunking pipe to the ceiling for power supply cables and network cables.
Power supply cables are connected to a switch board, which is set on the wall by the door in all JICA schools. But, for network cables, there are no exit in a PC Lab., usually the exit for network cables is network box on a wall, and network cables come out from the ceiling to the network box. In all JICA schools, we couldn't find any exit for network cables. In addition, there's no network cable inside the trunking pipes.

Mabhensane High : One of 12 JICA school.
This school has developed wired local network in PC Lab.for themselves.
It's a great job. They don't need our support and can manage network well for themselves.

PC Lab. at Mabhensane.

Network cables connected to modular jack on a trunking pole..

They have made the exit of cables, that is, network box on the wall for themselves. .

Cables through a pole connected to jack.

2-4 August, 2014

Month	Day	Week	School	Region	Investgate	Work	Workshop
8	1	Fri	Nokuthula High	MANZINI		o	
	4	Mon	Nokuthula High	MANZINI		o	
	5	Tue	Nokuthula High	MANZINI		o	
	6	Wed	Nokuthula High	MANZINI		o	
	7	Thu	Sibusisweni High	LUBOMBO		o	
	8	Fri	Nokuthula High	MANZINI		o	
	11	Mon	Nokuthula High	MANZINI		o	
	12	Tue	Sibusisweni High	LUBOMBO		o	
	13	Wed	Nokuthula High	MANZINI		o	
	14	Thu	Nokuthula High	MANZINI		o	
	21	Thu	Sigcaweni High	LUBOMBO		o	
	22	Fri	Sigcaweni High	LUBOMBO		o	
	25	Mon	Sigcaweni High	LUBOMBO		o	
	26	Tue	Sigcaweni High	LUBOMBO		o	

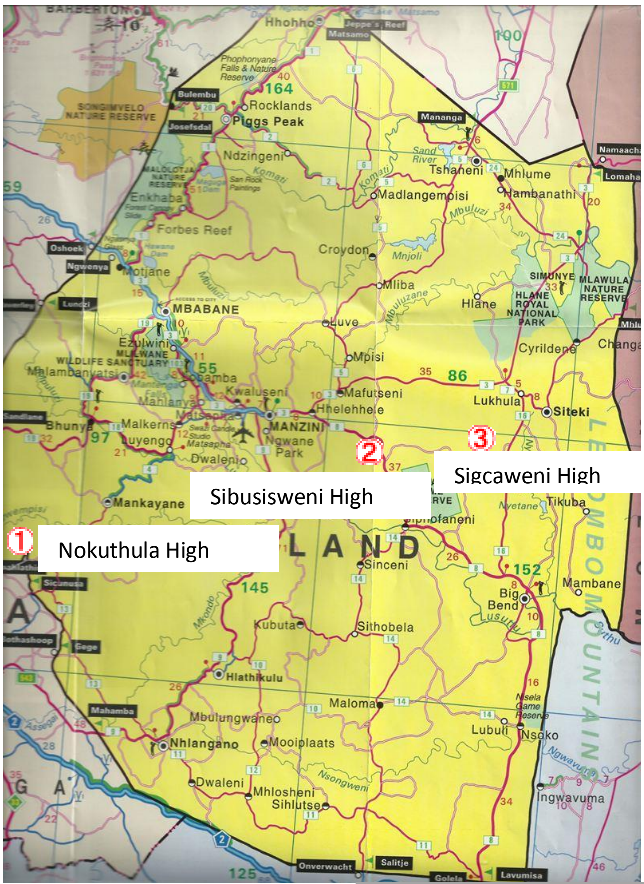
① Nokuthula High School Aug.1st - Aug. 11th

1.. There are PCs with Windows8, Windows7 and WindowsXP. Ethernet controller on PCs with Win7 donated by Taiwan were removed. We found many computer viruses on Win7 and WinXP machines.

2. Expired antivirus software 'McAfee' blocked PING command, so we removed 'McAfee' first.

3. We activated Windows Security Essentials for Win7 and Windows Defender for Win8. But we didn't have any alternative anti-virus software for WinXP.

4. In PC Lab., there are 7 tables. We put a 8 port switch on each table and one center HUB and a Router in the admin room.



PC Lab. in Nokuthula High.

After trunking of

PC Lab. in Nokuthula High.

A teacher in design course (R) helped us to make wood panel for the centre HUB. Mr. Dlamini(L), ICT teacher, is working with him.

Centre HUB on the wood panel is set over the door of the admin room. All network cables are connected to this HUB, from where a cable is connected to the Router.

② Sibusisweni High School Aug.7,12,Sep.10,11

1.. There are PCs with Windows8, Windows7 and WindowsXP .

2. The school has already HUB and network cables connected with WinXP and Win7 PCs and HUB.
   But there's no router and cable connection at the HUB are not stable.

3. We installed a router and connected all Win8 PCs into the local network.
   Win7 and WinXP PCs also use DHCP function by the Router.

4. For anti-virus software, we activated Windows Defender for Win8 PCs.

PC Lab. at Sibusisweni High.
PCs are well managed.

Connection at he HUB are not stable because of connectors on cables.
We asked ICT teacher to remake them.

③ Sigcawenii High School Aug.21 - ,Aug.26

1. See Page 10 for current state of PC Lab. in this school.

2. Just like Sibsisweni High, this PC Lab. also has enough equipment for LAN, but network doesn't work.
   There are PCs with Windows8, Windows7 and WindowsXP
   The school has already HUB and network cables connected with WinXP and Win7 PCs and HUB.
   But there's no router.

3. We installed all new Win8 PCs.

4. We installed a router and connected all Win8 PCs into the local network.
   Win7 and WinXP PCs also use DHCP function by the Router.
   The local network in this PC Lab. worked well.

4. Mr. Dlamini, ICT Teacher at Nokuthula High (See Page 11), offered to help our work at other PC Lab. after comleting the work at his school. He accompanied with us to Sigcaweni High and supported our works there so much.

We made all network cables for new PCs..

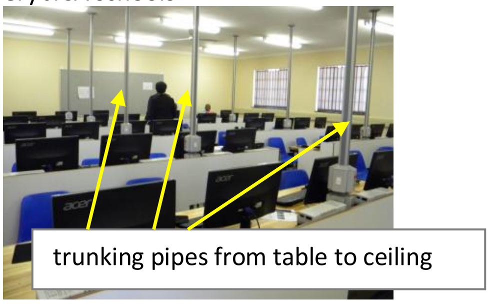
ICT teacher is working under the table to wire network cables.

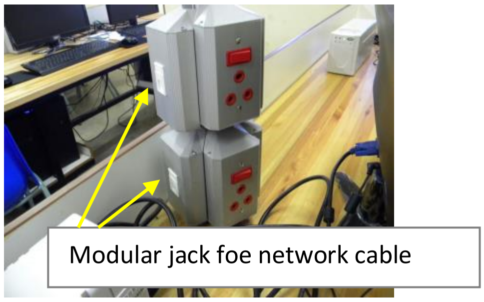
Switching HUB and Router

2-5 JICA schools

As described in page 10, JICA schools have same problems in local network.
The problems and our solutions are ;

1.Trunking pipes from each table to ceiling and modular jacks for UTP cables (network cables) are installed in every JICA schools





But there's no network cables inside pipe and no exit for cables from ceiling. In addition there's no equipment to accommodate network cables like a network box, switching HUB and Router.
After JICA has handed 12 schools to the country, each school should do additional works like power supply, setting of tables and chairs and so on. Works for setting up of network environment was also one of these tasks.

But I found the additional work for setting up local network was incomplete in every JICA school.
We need to wire network cables in trunking pipes and over the ceiling, we need to make exit for network cables on the ceiling and make new accommodation for cables, just like Mabhensane High School (See Page 10), which is over our support range.

2. There are two selections for JICA schools ;
   2-1 to set up wired network just like Mabhensane High school.
   2-2 to set up wireless network by using USB network adaptor on each PC

Wired network is not expensive to set up, but works for wiring cables over the ceiling may be out of our support range and it seems difficult for ICT teachers in each JICA school to maintain them after setting up.

Wireless network is somehow expensive to set up, because USB network adaptor may cost around E300 for each PC and each JICA school has more than 35 PCs, in total we need roughly E15,000 including a router and access point. But it's very easy to maintain the network after setting up. ICT teachers in JICA school can easily do it.

3. We sent a report to JICA Office in Pretoria SA to explain the current state of PC Lab. in JICA schools. JICA Office showed concern on this matter, so we asked PS to send a letter to JICA Office whether it would be possible to support financially for setting up local network in PC Lab. in JICA schools.

Usually JICA can't give financial aid to target organization of JICA volunteer's activity directly, but if JICA judges it necessary, JICA can give financial support , but it's not for target organization but for volunteer's activity itself.

JICA has got the letter from PS and judged it necessary to give financial support to JICA schools, but there's a condition which says JICA's support can be given only to JICA schools where I, as JICA volunteer, work for local network development.

4. For JICA schools, we decide to set up wireless network.
It will cost around E15,000 for each school, and it may cost more than in case of wired network. But we know that wireless network may be easier to maintain and after setting up ICT teachers in each JICA school must do it for themselves without our technical support.

'Simple set-up and easy maintenance' is the main point for schools.

We've got information that there are some schools which already have developed local network in the PC Lab., Mabhensanei High and Masibekele High. So, we started to make a plan for other 10 schools.

In September, we planned to start Nyetane High and Hawane High.

JICA school list

No.	School name	Region	Remarks
1	Nyetane High school	LUBOMBO	
2	Hawane High school	HHOHHO	
3	Nhlambeni High school	MANZINI	Already networked
4	Mliba High School	LUBOMBO	
5	Sobokazana High School	HHOHHO/PiggsPeak	
6	Mpakeni High School	SHIISELWENI	Already networked
7	Maphensane High School	MANZINI/Mankayane	Networked but has some troubles
8	Masibekela High School	HHOHHO	Partly networked
9	Mandulo High School	SHISELWENI	
10	Mabondvweni High School	LUBOMBO	
11	Dinani High School	MANZINI	
12	Mlambo High School	SHISELWENI	Already networked

2-6 September, 2014

Month	Day	Week	School	Region	Investgate	Work	Workshop
9	1	Mon	Thocoza Centre	HHOHHO/Mbabane			o
	2	Tue	Thocoza Centre	HHOHHO/Mbabane			o
	3	Wed	Thocoza Centre	HHOHHO/Mbabane			o
	4	Thu	Thocoza Centre	HHOHHO/Mbabane			o
	5	Fri	Thocoza Centre	HHOHHO/Mbabane			o
	10	Wed	Sibusisweni High	LUBOMBO		o	
	11	Thu	Sibusisweni High	LUBOMBO		o	
	12	Fri	Manzini / Nazaren High	MANZINI			o
	15	Mon	ManziniCentral High	MANZINI	o		
	16	Tue	Nyetane High (JICA)	LUBOMBO		o	
	17	Wed	Nyetane High (JICA)	LUBOMBO		o	
	18	Thu	Nyetane High (JICA)	LUBOMBO		o	
	19	Fri	Hawane High (JICA)	HHOHHO/PiggsPeak		o	
	23	Tue	Hawane High (JICA)	HHOHHO/PiggsPeak		o	
	24	Wed	Ndabazezwe High	SHISELWENI	o		
	25	Thu	Ndabazezwe High/FransonChristian	SHISELWENI	o	o	
	26	Fri	Edlaweni High	SHISELWENI	o		
	29	Mon	St.Francis High	HHOHHO/Mbabane		o	
	30	Tue	Nhlangano REO	SHISELWENI		o	

Workshop at Thokoza Centre (1 September 2014 – 6 September 2014)

1.. We had a workshop for ICT Syllabus development at Thokoza Centre in June (See Page 6), which continued to this workshop here in September.

2. We completed Primay and Junior Secondary level of ICT Syllabus development.

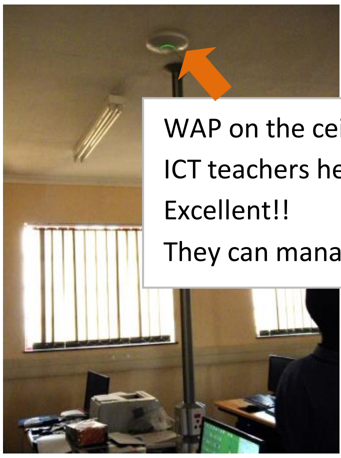
① Sibusisweni High School Sep.10,11

1. We started the work here August 8th. But we suspended our work at this school because of school holidays.

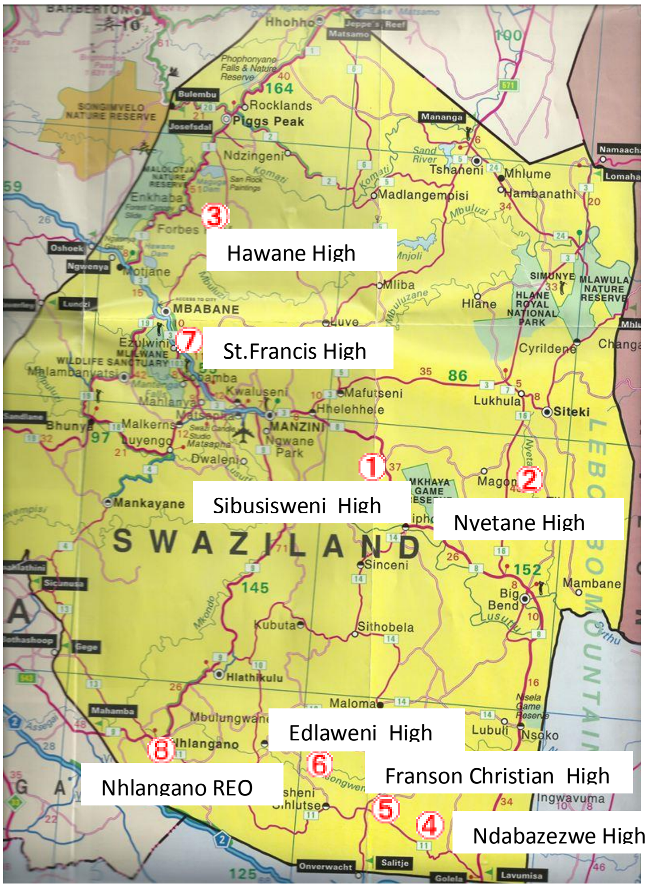
   In September, we restarted the work here.
   After wiring network cables and setting up a switching HUB, we confirmed the connection of PCs to the local network.

② Nyetane High School Sep.16 - 18 (JICA school)

1. This is the first JICA school we set up local network.
   With JICA's financial support, we provides
   a Router
   a Wireless Access Point (WAP)
   37 USB network adaptors
   to Nyetane High.
2. Computer management of this school is good.
   All 37 PCs work well and no computer viruses were found here. New local network will work well.

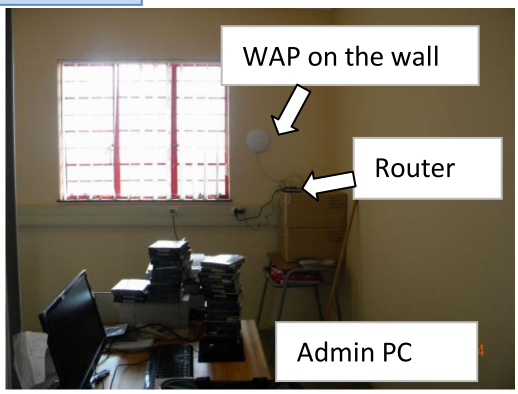


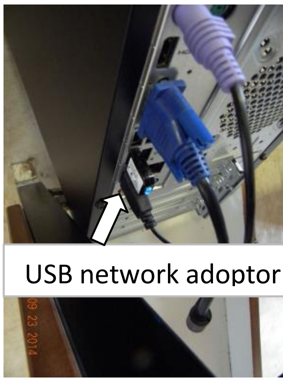
WAP on the ceiling
ICT teachers here did it for themselves.
Excellent!!
They can manage network well, too.

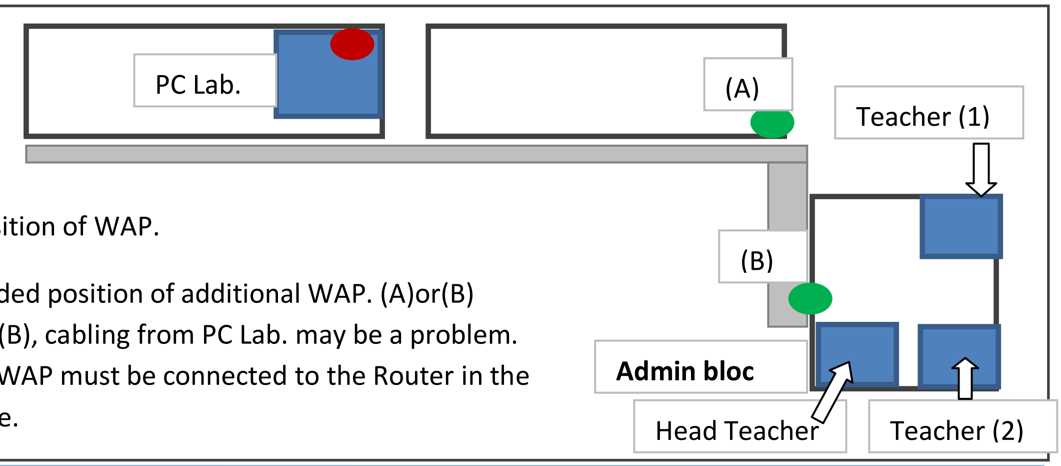


③ Hawane High School Sep.19, 23 (JICA school)

1. .After I showed how we install USB network adaptor, ICT teacher here completed to install almost all adaptors herself.
2. They asked us to connect a PC in the Admin Block to the local network in the PC Lab. We checked, but we found the signal was weak.
   We showed two plans for it.
   See the picture below.
3. We provided one Router, one WAP and 37 USB adaptors.







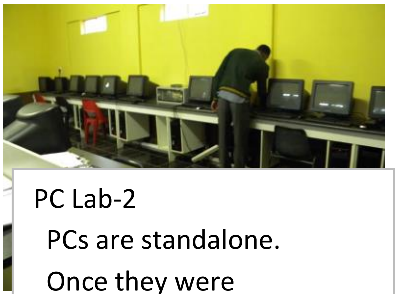
current position of WAP.

recommended position of additional WAP. (A)or(B)
in case of (B), cabling from PC Lab. may be a problem.
Additional WAP must be connected to the Router in the Lab by cable.

⑤ Franson Christian High School Sep.25 (Investigation)

1. This school has 3 PC Labs.

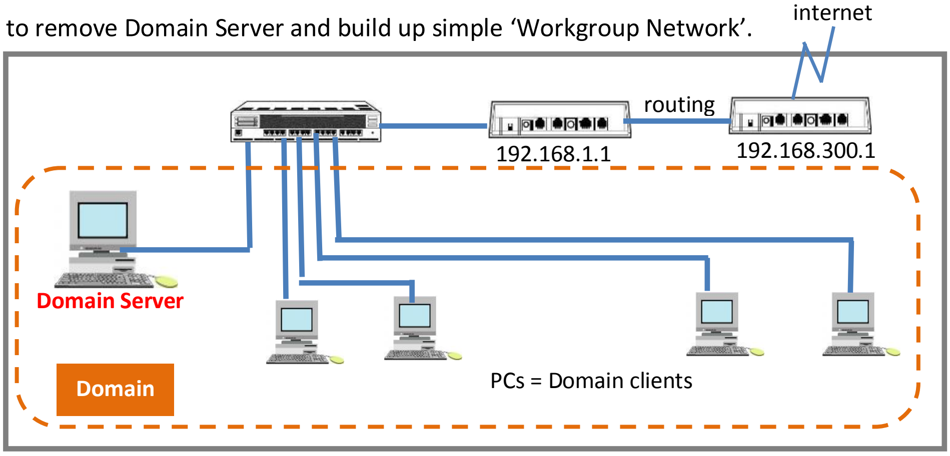
PC Lab-1
PCs are networked.
There are 2 Routers in the Admin Room.

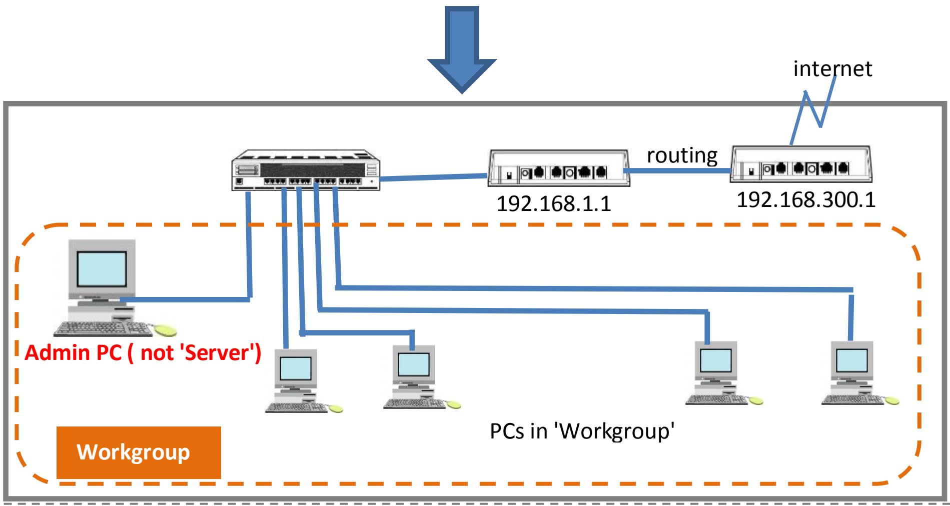


PC Lab-2
PCs are standalone.
Once they were networked.

PC Lab-3
There're 10 N-Computing PCs here.

1. For PC Lab-1,
   ICT teacher told me that Local network is working now, but problems are :
   Some PCs can't be seen in the network list
   Some PCs can't use shared printer
   I checked the network and found that ;
   PC server defined 'Domain Network', but client PCs defined 'Workgroup Network'
   PCs defined to use DHCP functions but they couldn't access the Router which is DHCP server.
2. I recommended ICT teacher to remove Domain Server and build up simple 'Workgroup Network'.
3. I introduced ICT teachers how to make PC settings for local network, and how to make shared printer.
4. We completed to make simple local network and shared printer here.





⑥ Edwaleni High School Sep.26

1. ICT teachers told me that ;
    They made a local network in the Lab.
    but some PCs were not displayed in the network PC list,
    some PCs couldn't use shared printer..
   It's just same case as in Franson Christian High.
2. They have 2 switches , but there's no Router.

PC Lab. in Edwaleni High

There's a switch, but no router

1. I checked the network configuration and found that ;
   1-1 in the network there's a server which is running on Windows Server 2008
   1-2 the server defined 'Domain network',
   1-3 but all PCs defined 'Workgroup Network'. --------- (1)
   1-4 there are two switch but no router here. ------(2)
2. I checked network configuration on PCs .
   2-1 PCs define DHCP function activated,.
   2-2 I checked IP adresses on PCs and found that all PCs get IP address starting from 169.xxx, which shows no DHCP function works in the network. ------ (3)

From (1) shown above, I suggested that they'd better remove Domain Network, which means to remove Windows Server.

They told me that it doesn't matter, so I asked them to remove Windows Server PC and put another PC (Windows 8 PC) as an admin PC.

I defined Shared Folder and Shared printer on it .

I found that Windows server doesn't work as DHCP server, and from (2) and (3), I decided to give fixed IP address to each PC. So I taught them how to define fixed IP address and join the local network (with unique PC name and 'workgroup' network).

I confirmed problems were solved and all PCs became enable to use shared printer.

ICT teachers remove Server PC.

ICT teachers are setting PC configuration.

For ICT teachers, it's too much job to manage 'Domain Network' for themselves.
They'd better to build a simple 'Workgroup Network'.

2-7 October, 2014

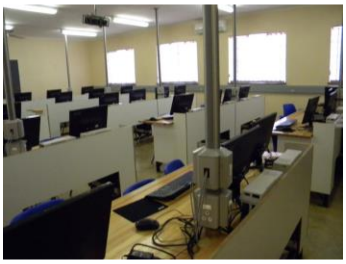
Month	Day	Week	School	Region	Investgate	Work	Workshop
１０	1	Wed	Mkhombo High	SHISELWENI	○		
			Mandulo High (JICA)	SHISELWENI	○		
			Nhlangano REO	SHISELWENI		○	
			Mlambo High (JICA)	SHISELWENI	○		
	2	Thu	Mconji High	MANZINI/North	○		
			Madlangempisi High	MANZINI/North	○		
			Dinani High (JICA)	MANZINI/North	○		
	6	Mon	Mliba High (JICA)	LUBOMBO		○	
	7	Tue	Mliba High (JICA)	LUBOMBO		○	
	8	Wed	Mliba High (JICA)	LUBOMBO		○	
	１０	Fri	Mabhensane High (JICA)	MANZINI/Mankayane		○	
	１３	Mon	Sobokazana High (JICA)	HHOHHO/PiggsPeak		○	
	14～17		Transport Problem				
	２０	Mon	Sobokazana High (JICA)	HHOHHO/PiggsPeak		○	
	２１	Tue	Masibekela High (JICA)	HHOHHO		○	
	２２	Wed	Franson Christian High	SHISELWENI		○	
	23～28,30		Transport Problem				
	２９	Wed	Franson Christian High	SHISELWENI		○	
	３１	Fri	Franson Christian High	SHISELWENI		○	

① Mlambo High School Oct. 1 (JICA school)

This school has developed wired Local Network using trunking pipes and they have made a network box for themselves, it's a wooden cabinet. Great!!

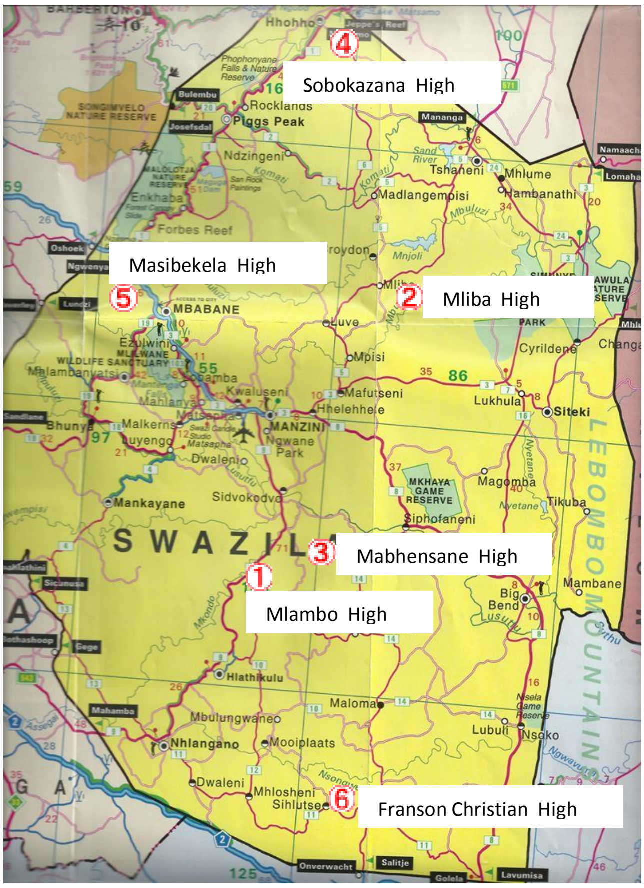
This school is the most advanced in 12 JICA schools in development of local network in a PC Lab.

They want to start to the next step where PCs in admin block could join into the current network.



PC Lab. in Mlambo High.

Wooden network box in the PC Lab. . fixed on the wall.



④ Sobokazana High School Oct. 13, 20 (JICA school)

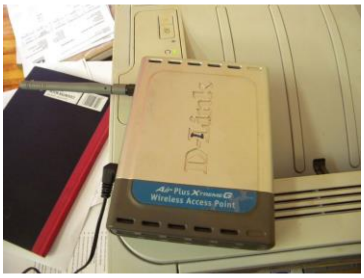
1. Some PCs in the PC Lab. here were already networked with cables.
   But ICT teacher here wanted to rebuild local network in the PC Lab. with wireless equipment.
2. ICT teacher here seems to me to have enough skill to manage PCs and network.

PC Lab. in Sobokazana High

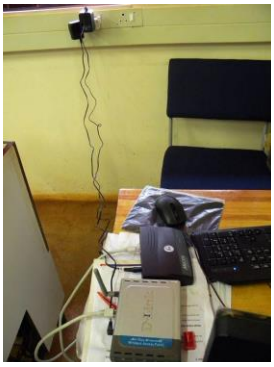
They have already wired network equipment.

⑤ Masibekela High School Oct. 21 (JICA school)

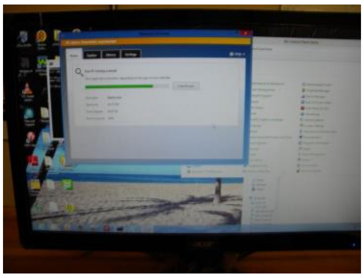
1. Once we heard that Masibekela High has already set up wireless local network in the PC Lab., but actually only 10 PCs were connected, more than 20 other PCs were not connected.
2. We are requested to connect these unconnected PCs to the local network.



They have a WAP(wireless access point).



We provided a router and connect WAP to the router.



Before setting USB network adaptor, we checked Viruses on each PC.

3. We checked current state of this PC Lab. We found that ;
   3-1 There's no router nor PC server, so IP address of PCs were not managed at all.
   3-2 WAP(Wireless Access Point) was 'D-LINK 2100', which is not so good one but we can use the WAP.
   3-3 There were 3 PCs which doesn't work.
4. First, we removed McAfee, anti-virus software from all PCs, because this tool is trial version and will be expired soon. All the donated PCs in the country has McAfee trial version as Anti-Virus tool, but we should remove it because after expiration for trial, no school has got budget for registration. We'd better not to use McAfee. We activated Windows Defender for anti-virus software, and install the latest definition files(pattern files).
5. We set one Router and activate DHCP function to manage IP address.
6. After setting anti-virus software, we connected all PCs with USB wireless network adaptors.

⑥ Franson Christian High School Oct 22,29,31

1. As described before (see Page 17), this school has 3 PC Labs., and we solved one PC Lab's problem.
2. Now, the target is the second Lab. where once wired network were set there but all equipment were removed. Their request is 'to rebuild local network in the PC Lab.'.
3. In the second PC Lab., network cables and trunking materials still remained in the Lab.

Network cables and trunking materials still remained.

Cables were got untangled.

They have two switches but one didn't work any more.

4. As described before (see Page 16), this school has 3 PC Labs., and we solved one PC Lab's problem.
5. Now, the target is the second Lab. where once wired network were set there but all equipment were removed. Their request is 'to rebuild local network in the PC Lab.'.
6. In the second PC Lab., network cables and trunking materials still remained in the Lab.

First we disentangled all cables. Pupils there helped us so much.

We reused one switch and connected it to the router.

We reused trunking materials.

All PCs were connected into the local network again.

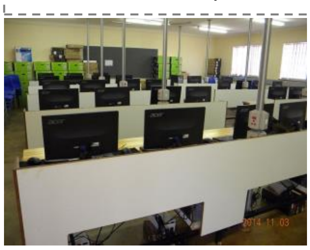
2-8 November, 2014

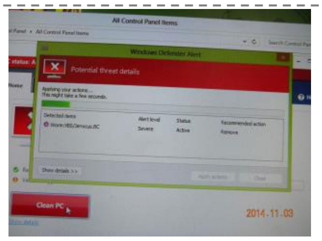
Month	Day	Week	School	Region	Investgate	Work	Workshop
１１	3	Mon	Mandulo High(JICA)	SHISELWENI		o	
	4	Tue	Mandulo High (JICA)	SHISELWENI		o	
	5	Wed	Ndwandwe High	MANZINI/Mankayane		o	
	6	Thu	Ndwandwe High	MANZINI/Mankayane		o	
	7	Fri	Ndwandwe High	MANZINI/Mankayane		o	
	１０	Mon	Transport Problem				
	１１	Tue	Sibovu High	MANZINI/Mankayane		o	
	１２	Wed	Sibovu High	MANZINI/Mankayane		o	
	１３	Thu	Sibovu High	MANZINI/Mankayane		o	
	１４	Fri	eDoropeni High	SHISELWENI	o		
	１７	Mon	Dinani High (JICA)	MANZINI/North		o	
	１８	Tue	Dinani High (JICA)	MANZINI/North		o	
	１９	Wed	Mabondvweni (JICA)	LUBOMBO		o	
	２０	Thu	Mabondvweni (JICA)	LUBOMBO		o	
	２１	Fri	Jerusalem High	SHISELWENI	o		
	24 - 27		Pretoria to attend JICA meeting				

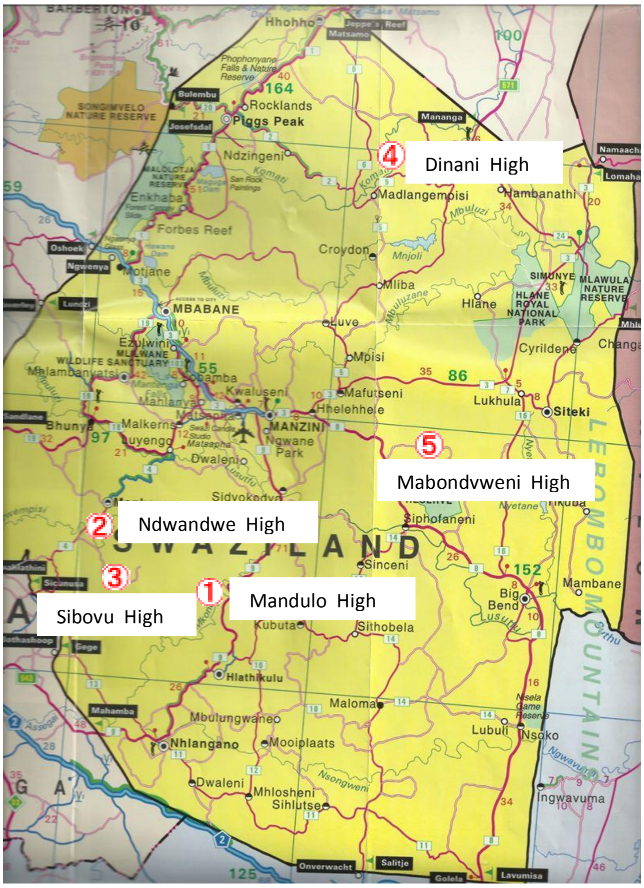
① Mandulo High School Nov. 3,4 (JICA School)

One of JICA schools.

1. We removed McAfee from all PCs and activated Windows defender, did quick Scan on them.
2. There were so many Computer viruses here.
3. Many PCs has wrong Date&Time, one PC showed year 2031 as current year.
4. We couldn't say that computer management here was good.
5. ICT teacher wanted to access to the PC Lab. from admin bloc, but the signal was somehow weak and not stable, so we couldn't help giving it up.
6. We've set 37 USB network adaptors and connected PCs to local network.
7. This school may need follow-up support later.





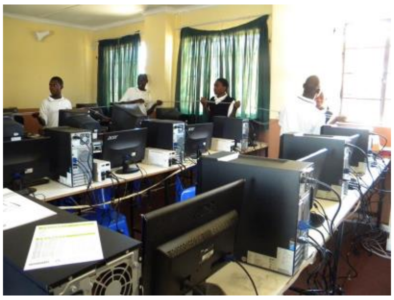


(upper L) PC Lab. in Mandulo High
(upper R) Message showed severe virus 'Jenxcus.BC' was detected in one PC.
(lower L) WAP and a router fixed on a wall.

② Ndwandwe High School Nov. 5 - 7

1. This school has a small PC Lab., but all PCs were well managed. ICT teachers and pupils were very cooperative with our works. ICT teachers have good ICT skills.

PC Lab. in Ndwandwe High

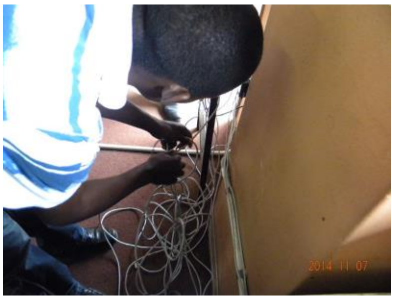


Pupils helped us to measure necessary length of network cables.

I showed ICT teacher how to make a network cable.
Then, he passed it to his pupils.
They could make cables pretty well.

Switching HUB in the PC Lab

After wiring network cables, cables have got entangled so much.



One of ICT teachers started to disentangle them.

After disentangling of cables. Great job!!.

2. After completing our works there, one of ICT teacher, Mr. Shabalala, told me that he wanted to support my works in other schools. So I asked him to help us at the next school, which is Sibovu High.

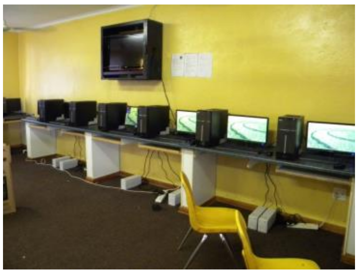
③ **Sibovu High School Nov. 11 - 13**

1. This school has got 17 new PCs and now they tried to remove some of old PCs.
2. New PCs were still in package.
3. On first day, we set up new PCs. Pupils there helped us to unpack PCs and monitors.
   They didn't have a Router and we needed more network cables. So I asked Head teacher to buy them.
   Next day the ICT teacher came to the ministry with money, we could continue our work without suspension.
4. We set up the router and completed to build up the local network there on schedule.

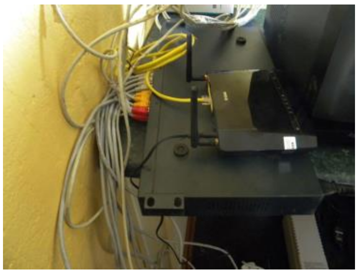
Pupils were taking new PC's package out.

Pupils were taking some old PCs and devices i.

Packages of new PCs



Pcs were setting up in the PC Lab.



Router,Switch and network cables

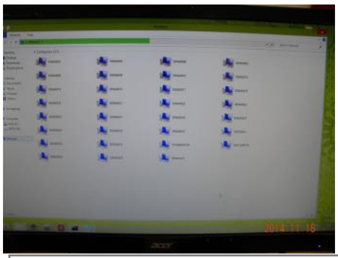
ICT teachers and others were checking a PC.

④ **Dinani High School Nov. 17, 18 (JICA School)**

2. One of JICA schools, it's very far, passing Dvokolwako, passing Madlangempisi and finally we arrived at Dinani High.
3. Just like other JICA schools, we provided a router, WAP and 37 USB network adaptors to Dinani High.
4. PCs in this PC Lab. had so many computer viruses, so we spent first day to make PCs clean.
5. Two ICT teachers there set USB network adaptors while we were back to Mbabane and on the second day we found all PCs were ready to check connection to local network.
6. One ICT teacher told me that he wanted to support other school with us.

PC Lab. in Dinani High

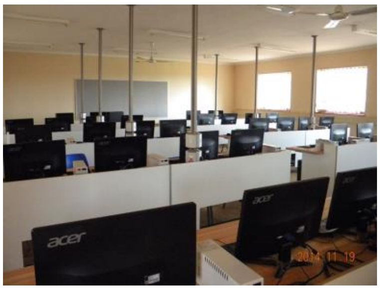
Router and WAP on the wall.



List of PCs in the LAN

⑤ Mabondvweni High School Nov. 19, 20 (JICA School)

1. Mabondvweni High is also one of JICA schools placed between Gilgal High and Sigcaweni High.
2. PC Lab. there has so many computer viruses, we spent first day to make PCs clean just same as Dinani High.
3. Two ICT teachers there set USB network adaptors while we were back to Mbabane. (It's just same as in Dinani High).
4. I'm worried a little bit about the PC management there, but ICT teachers can do it, I hope.



PC Lab. in Mabondvwenii High

Router and WAP
We couldn't fix them on the wall. We need an electric drill to fix it on the wall.

Admin PC with a shred printer

2-9 December, 2014

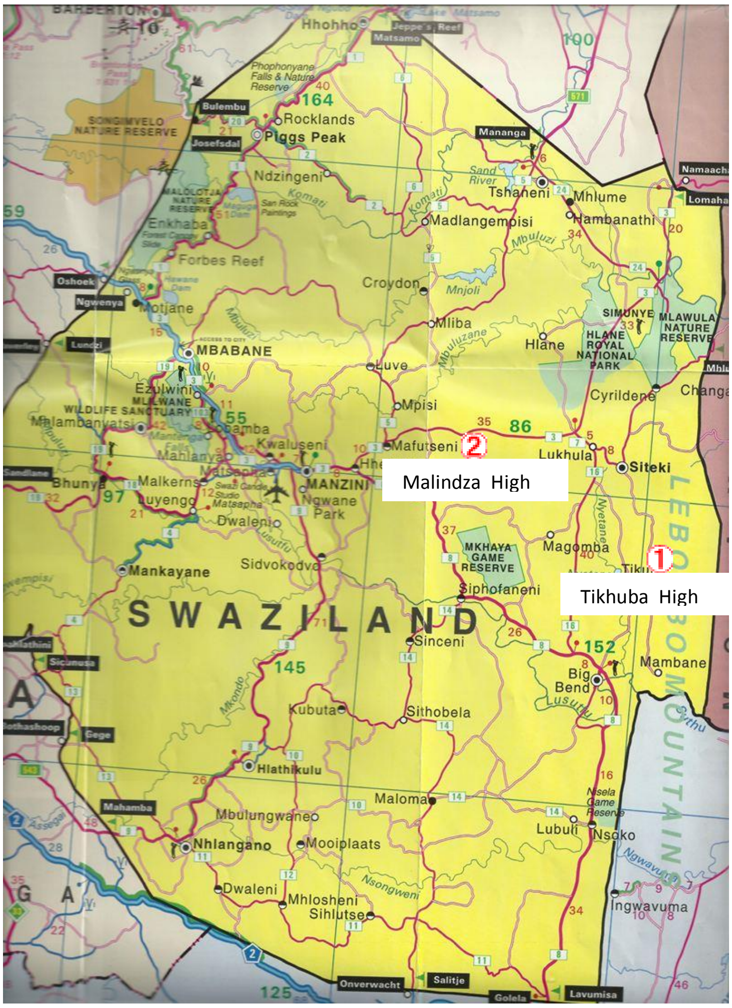
Month	Day	Week	School	Region	Investgate	Work	Workshop
１２	1	Mon	Tikhuba High	LUBOMBO	○		
			Malindza High	LUBOMBO	○		
	2	Tue	Nkiliji High	MANZINI	○		
			Gundvwini High	MANZINI	○		
	１０	Wed	Tikhuba High	LUBOMBO		○	
	１１	Thu	Tikhuba High	LUBOMBO		○	
	１２	Fri	Tikhuba High	LUBOMBO		○	
	１６	Tue	Malindza High	LUBOMBO		○	
	１７	Wed	Malindza High	LUBOMBO		○	
	１８	Thu	Malindza High	LUBOMBO		○	

① Tikhuba High School Dec. 10 - 12

1. Two ICT teachers supported me ;
   Mr. Dlamini ICT teacher in Nokuthula High
   Mr. Hlophe ICT teacher in St. Marks High
2. First day, there's no ICT teacher and Head teacher
   There were N-computing PCs.

   And 17 new PCs were still in packages.

   We didn't get any direction on how we set new 17 PCs here. We discussed for a while and decided to remove N-Computing PC from 2 tables.
   On first day (10^{th} Dec.), we set up all new PCs.
3. On second day, we had power failure all day long.
   We made network cables with ICT teacher.
4. On last day, we connected all new PCs to local network and set up a shared printer.
5. This school may need follow-up support later.



Two supporting teachers were unpacking new PCs

Two supporting teachers were teaching ICT teacher here how to make network cables.

② Malindza High School Dec. 16 - 18

1. This school had also 17 new PCs kept in packages.
   Supporting ICT teachers, Mr. Hlophe and Mr. Dlamini helped me to unpack them and set them up.

2. When we asked ICT teacher there where a printer to be shared in the local network, he couldn't answer. After we found one printer in the PC Lab., there wasn't a install CD, so we couldn't help giving up to set up shared printer in the PC Lab.

   In the last term, I had once visited this school and found that all PCs and devices were not be networked but well managed. I'm afraid that PCs and other devices here might not be managed well.

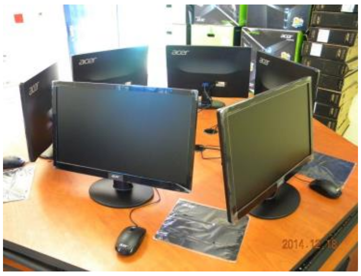
PC Lab. in Malindza High

Packages of new PCs after setting up PCs.

Monitors removed and put window-side

Switch and Router in the admin room

From PC Lab to admin room, we made a hole on the wall to let cables go through.



New PCs after setting up

2-10 January, 2015

Month	Day	Week	School	Region	Investgate	Work	Workshop
1	12	Mon	eDopropeni High	SHISELWENI		o	
	13	Tue	eDopropeni High	SHISELWENI		o	
	14	Wed	Gundvwini High	MANZINI		o	
	15	Thu	eDopropeni High	SHISELWENI		o	
	19	Mon	Ejubukweni High	HHOHHO		o	
	20	Tue	Ejubukweni High	HHOHHO		o	
	21	Wed	Ejubukweni High	HHOHHO		o	
			Gundvwini High	MANZINI		o	
	22	Thu	Jerusalem High	SHISELWENI		o	
	23	Fri	Jerusalem High	SHISELWENI		o	

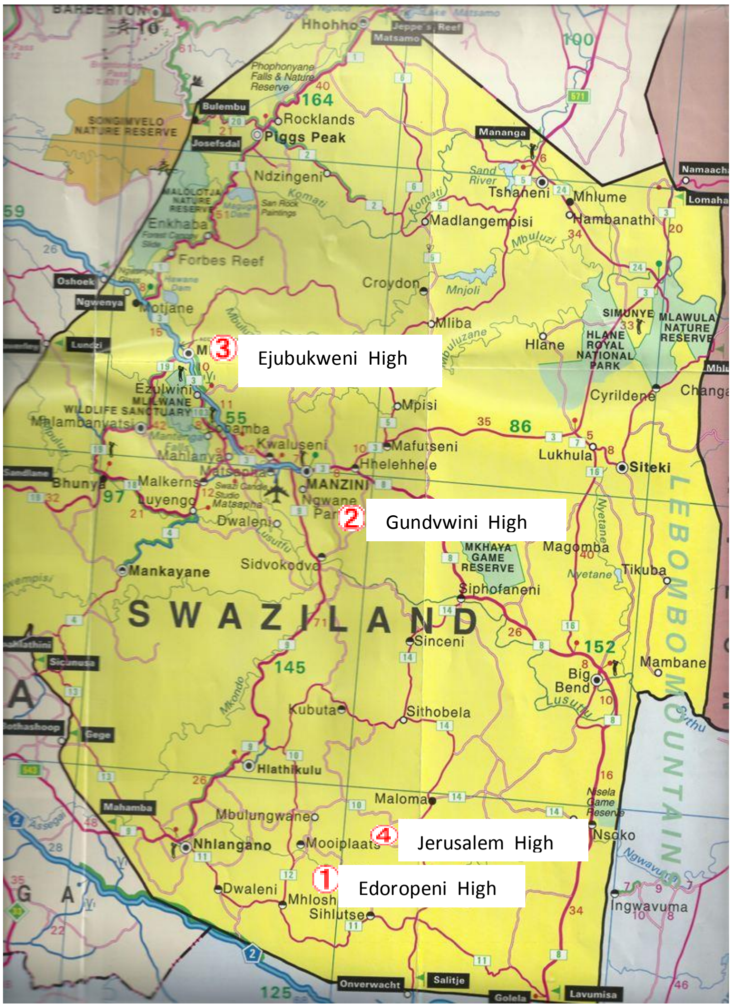
Two ICT teachers supported my works for these 4 schools
Mr. Dlamini ICT teacher in Nokuthula High
Mr. Hlophe ICT teacher in St. Marks High

① Edoropeni High School Jan. 12,13,15

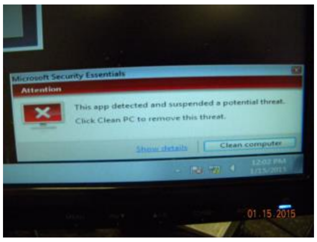
1. They had N-Computing PCs and some Windows8 new PCs.

   In the PC Lab., there are 7 tables and each table can accommodate 6 PCs.

   From each table, a trunking pole goes up to the ceiling. 5 tables accommodate N-Computing PCs and these N-Computing PCs are connected to the network box in the admin room by UTP cables through ceiling.
2. Other 2 tables accommodate Windows 8 new PCs but there's no UTP cables in the trunking pole.
3. We set a 8 port switching HUB on 2 tables for new PCs and 4 port Router in the admin room. The school already have a 16 port switch in the admin room but it doesn't work when we checked it.
4. We checked N-Computing PCs and their connection to the local network. There were some problems in PCs and cables.



PC Lab. in Edoropeni High school



We found so many Computer Viruses there

They had a network box in the admin room. But there's only a HUB, so we asked to buy a router.

Teacher's PC in the admin room. We set shared folder and make a shared printer there.

This school may need follow-up support in future days.

② Gundvwini High School Jan. 14,21

This school has a PC Lab. with 7 tables and 17 new PCs, two new printers.

Many pupils helped us to unpack new PCs and set up them.

We have set up all new PCs, switched, a router, network cables and checked whether the local network works well. Everything went well and we could complete setting up the local network here only in one day.

PC Lab. before starting our work

Many pupils helped us to unpack new PCs and set them up.

Switch on each table

Center HUB, a router and two printers.

We fixed cables on the floor by plastic tape.

We fixed cables on the floor by plastic tape.

③ Ejubukweni High School Jan. 19 - 21

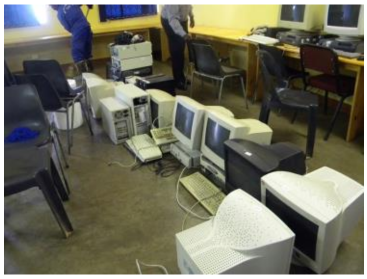
This school has 10 new PCs. I set up these new PCs, a switching HUB and a router.

We set up wired local network and connect all new PCs and some of old PCs.

We hope the ICT teacher here would manage OCs and the network here well.

PC Lab. before our works

Removing old PCs to set new ones



Removed old PCs

Switch and router

UTP cables wired on the tables

ICT teacher looking at setting of PCs

④ Jerusalem High School Jan. 22,23

How far this school is from Mbabane! It took 2 and half by car. We could work 3 hours at the school every day.
This school has old Windows XP PCs and Windows98 (!!) PCs. They have only one Windows7 PC.
We connected Win7 PC and all XP PCs, but I explained that we couldn't do any security measures on XP and 98 PCs because support and security updates for these OSs have ended already.

This school may need follow-up support in future days and need to replace old PCs to new ones.

Jerusalem High School

PC Lab. in Jerusalem High

Router and switch

A switch set on a table to accommodate some PCs and to connect to the center HUB

3. Findings and Suggestions through Network Development

Through our works to develop local networks in PC Lab. in high schools in the country, I've got some impressions.
Here I'd like to show these impressions/findings and some suggestions not only for local network development in school Labs but also for ICT education / environment to be improved.

Impressions / Findings

3-1 Lack of collaboration among schools

Every school keeps good communication with his/her community which is supporting the school, but schools seem to us not to have good communication with other schools, even though ICT teachers individually have good communication with other ICT teachers who are his/her friends.

The lack of collaboration among schools may result that ICT teacher might miss a chance to get knowledge and experiences of other schools, to apply them to his/her school and to improve his/her ICT skills.

The difference in levels of ICT skill of individual teacher reflects the difference in the level of PC Lab's management level.

3-2 Insufficient ICT skills of ICT teachers

Here I'd like to show 2 typical examples.

3-2-1 'Domain Network' and 'Work Group Network'

We can show one of cases shown below;、

One school called us to ask our support for their trouble in PC Lab., which is;

1. They have already one local network in their PC Lab.
2. Some PCs can't be seen in the network
3. Some PCs can't use shared printer.

When we visited the school, we found that ;

1. They have a Windows Server and defined 'Domain Network'.
2. The Windows Server had some trouble and didn't work at that time, which means 'Domain Network' didn't work.
3. Every client PC defined 'Workgroup Network'.
4. They didn't have a Router and DHCP function wasn't activated on the Windows Server.
5. Client PCs defined DHCP client function active.

With a little knowledge or experience in ICT field, one could find that under such condition described above, the local network wouldn't work well. Very basic ICT knowledge can find the inconsistency there. One teacher told me that a part of the network worked well, but it showed that only PCs with windows special IP address group, 169.xxx, could be worked well as if they were networked.

If an ICT teacher might not know whether the local network in his/her PC Lab. is 'Domain Network' or 'Workgroup Network', he/she would find it difficult to manage/maintain the network himself/herself.

If his/her PC Lab. has a Windows Server machine, he/she should know whether the Windows Server might defined 'Domain Network' or not, and if so, he/she should be familiar with 'Domain Network' management. In addition, he/she should know how client PCs get IP address if he/she wants to make use of DHCP function.

Frankly speaking, it seems difficult for ICT teachers in the country to manage/control 'Domain Network'.
If his/her PC Lab. is working with 'Domain Network', then I'd like to ask him/her what are differences between 'Domain Network' and 'Workgroup Network' and what are necessary tasks for 'Domain Network' which are not necessary for 'Workgroup Network'.

In high schools in the country, we should define simple network, 'simple network' means a 'Workgroup network' which can be managed easily.

3-2-2 Student PC locked with password

In some schools, I found student PCs which are locked with password and no one knows the password.
Student PCs are 'shared PC' , so we should not define login password on student PCs.

If students have some files / folders which should be kept secret from others, then ICT teacher should teach to define password on files / folders, not on login user. But I can't imagine such cases.

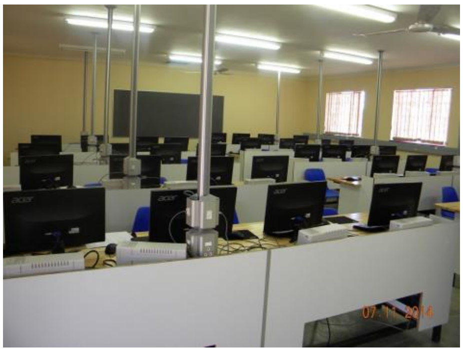
3-3 Non-systematic and insufficient succession of information from teacher to teacher when a teacher move to other school/position

ICT teachers may move to other school or get another opportunity in some other work place.
In such cases, new teacher must keep PC Lab. just as same level as before he/she comes to the school.
But actually we have found many cases where new ICT teachers didn't get any information from the ICT teacher who has left the school.

See Page 20 where you can see such a case.
ICT teacher doesn't know the password to login to the Windows Server, because he/she didn't get any information from ex-ICT teacher about the password on the server.
How can new ICT teachers manage the server system?
Why didn't ex-ICT teacher leave any information of Windows Server in the PC Lab.?

3-4 Shortage of the inspection ability for ICT-related facilities construction

As I mentioned about JICA schools or you can find in the case of Gundvwini high school, we've found in some schools with incomplete ICT-related construction works, which are trunking poles on a table going up to ceiling that accomodate power cables but not network cables even though they have modular jacks for network cables. In addition, in PC Lab., there's an exit from ceiling for electricity power cables, switchboard, but there's no exit for network cables from ceiling.



Trunking poles on tables in PC Lab.
All JICA school and some non-JICA schools have these facilities to wire power cables and network cables to ceiling.

Each trunking pole has modular jacks on it. PCs can be connected by UTP(network) cable to these modular jacks..

Network cables should have an exit from ceiling, which is a network box on a wall. But in all cases, we found there's no exit from ceiling. Photo shown above is a case in Mlambo High. They have made a network box for themselves.

Modular jack should be connected to UTP cable(network cable). But in all JICA schools, we found there's no cables inside pole. Photo shown above is a case in Mabhensane High, they wired cables for themselves.

If schools or ICT teachers might have enough ability for inspection of such ICT-related construction works, we might avoid such incomplete works.
If you know your school might need network environment in future days, you could have asked to make an exit for network cables, network box on the wall, and to wire cables inside trunking poles and over the ceiling to construction agency.
If you know your school might not need network environment currently, you could have rejected the plan which a construction agent had showed to your school, which means you could ask trunking poles with only power cables, without modular jacks for network cables.

We need more inspection ability for such construction works while planning stage and handing over stage.

Suggestions / Recommendations

3-5 Grouping for Collaboration among schools

We have found that there are so much differences in management level of PC Labs. among high schools. And we also found that this difference in management level depends on difference in ICT skill of ICT teachers assigned to each high school. To make this difference smaller and raise management level up, we need to make collaboration among schools concerned with PC lab. management.

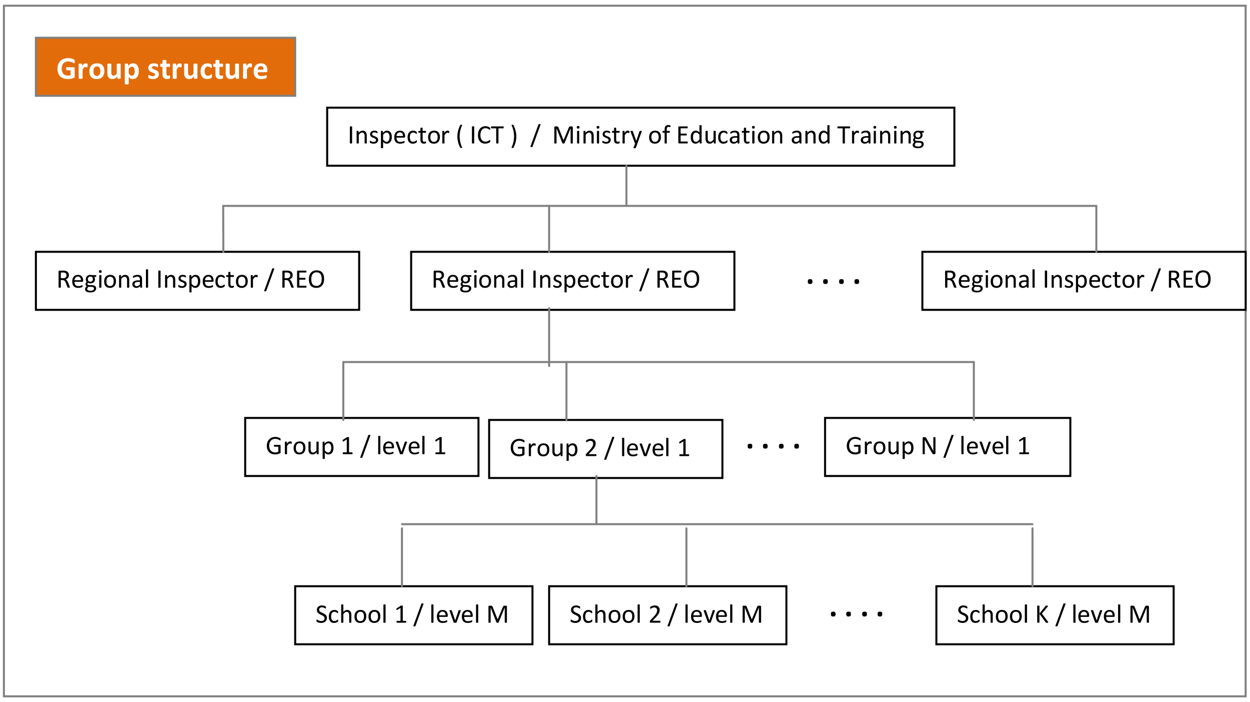
To make collaboration among high schools much more active, I recommend to make a group of neighboring schools and to make the group the basic unit for sharing of knowledge and experiences and exchanging of information. In a group, there must be at least one ICT teacher with good ICT skill or a school with good ICT environment.

In a group, target works are shown below ;

1. Knowledge and experience sharing for troubles and trouble shooting .
2. Giving / taking advices from each other
3. Basic unit for providing the latest Definition file of 'Anti-virus software'
4. Cooperation for developing local network at schools in a group.
5. Standardizing of PC Lab's management style in high schools

The basic level groups may belong to upper level group which might be a 'Regional Group', or if there are so many groups in a region, we can put the upper level under Regional Group.
What is important is that there must be at least one ICT teacher with good ICT skills in a basic group.

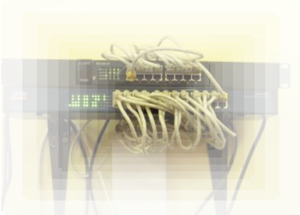
Shared knowledge / experiences in a group can be shared in a region level group or directly shared with other groups.
We could use SNS like Facebook / LinkedIn for communication in a group or among groups.



It might be effective for group activities if the ministry could give some incentive to a group who has done a good performance annually.

We'd better make model groups with schools which we have already set up the local network.
For example ;
Sigcaweni High, Sibsisweni High and Mabondvweni High can make one group and Gilgal High can join them.
Ndabazezwe High, Franson Christian High and Edwaleni High can make one group, and Jerusalem High can join them.
Nokuthula High, Sibovu High and Ndwandwe High can make one group.
Dvokolwako High, Mliba High, Madlangempisi High and Dinani High can make one group.
Other neighboring schools can join these groups.

As for works to set up local network in a PC Lab. in a high school, it might be a good practice for ICT teachers to support other schools in his/her group. He/she could acquire experiences in setting up networks and dealing effectively with PC/network troubles.



As for Anti-virus measures, the latest definition files for Microsoft Defender (for Win8) / Security Essentials (for Win7) are issued in Microsoft Web Site at an appropriate interval. But considering about the current infrastructure of internet, we can't say every school in the country can download the latest definition files from Microsoft Web Site for themselves. We should say almost all schools can't download because of lack of internet connection or vulnerability in internet environment.
The definition files of Microsoft Anti-virus software can be saved on external devices like CD or USB disk and can apply to PCs in batch mode, which means if we have the latest definition files on an external device, we don't need internet connection when we update it. (Almost all Anti-virus software need internet connection to update a PC's anti-virus environment with the latest definition files.)
This is one of the reason why we recommend to use Microsoft Anti-virus software.

In Swaziland, we can have relatively better environment for internet connection in Mbabane or Manzini. We can download the latest definition files at Mbabane or Manzini at regular intervals, for example, monthly.
If we download the latest version at one of a high school in a group in Mbabane or Manzini, and submit it to the Ministry of Education and Training, then the Ministry can provide a CD with the latest definition files to many schools in the country through groups. In this way, such schools with poor internet environment can update Anti-virus definition files with the latest version.

In addition, it is the Ministry of ICT who manage the government ICT environment totally, so they may have a good environment for internet connection. If the Ministry of ICT could download the latest definition files and provide them to other Ministry at regular intervals, then we could make an another route for the provision, from the Ministry of ICT to the Ministry of Education and Training and finally to each group and schools.
How could our Ministry appeal to the Ministry of ICT to take initiative for this Anti-virus update system?

3-6 Collaboration with college / university

As I showed in '3-2 Insufficient ICT skills of ICT teachers', ICT teachers in high schools need much more ICT skills. I suppose there's not enough learning / training opportunities in colleges or university for students in ICT course. They need much more opportunities for training / practices to get basic ICT skills.

I have one idea for raising up ICT teacher's skills,

Can't we mobilize students of ICT course in colleges or university to our works for Local network development in high schools?
Can't we expect their support for Local Network development / maintenance in high schools?
Can't we give some credits in their course to those who have supported our works in high schools?
Can't we make this an optional subject in their course?

I suppose this work, Local network development in High schools, could be very good practices and trainings for students of ICT course in college or university, especially students in SCOT.

3-7 Provision of Format for effective succession of knowledge/experiences (Provision of Format for effective PC Lab. management)

As I described in 3-3 (Page 33), there's lack of succession of information and knowledge/experience sharing when a teacher moves to other school or other work place.

In ICT jobs, it is essential to make and keep necessary documents. But for beginners, it's not easy to make and keep documents. Difficulty for them may start from 'to make a form'. But we can say if there's a given form then necessary task is only to fill blanks in a form. It means we can expect the same level of documents for beginners as those of advanced levels if we could prepare forms for various documents.

When we make it a rule to make and keep documents and make it effective rule, it is very important to prepare and provide a form. A form should be one where a teacher can complete it only by filling blanks , checking selections.

This is not only for succession / sharing of knowledge / experience but also for daily works , too. For example, a form for 'Reporting system trouble', a form for 'Changes in a current system'. It's important to prepare standardized forms and provide them to every school, then every ICT teacher can apply them even though he/she moves to other school. And each school can check the records for ICT management at any time.

A picture shown below is a document for Router settings of one high school where we have set up local network. ICT teacher should keep this document and it should be succeeded to the next ICT teacher.

[redacted] High School

IP address of the Router : 192.168.1.1

DHCP : IP range 192.168.1.31 - 192.168.1.254

IP addresses between 192.168.1.2 and 192.168.1.30 are reserved for fixed IP which you can assign to Admin PC, network printer and other devices with fixed IP address.

Wireless setting on the WAP

SSID : [redacted]High_AP_1

Key : m3Kb[redacted]Rhw

13 digits. Be careful with lower and upper case of letters.

lower	m
num.	3
upper	K
lower	b
[redacted]	
upper	R
lower	h
lower	w

We can arrange this document for one form which can be used in every school.
just like this;

High School

IP address of the Router :

DHCP : IP range -

IP addresses between and are reserved for fixed IP which you can assign to Admin PC, network printer and other devices with fixed IP address.

Wireless setting on the WAP

SSID :

Key :

13 digits. Be careful with lower and upper case of letters.

ICT teachers can fill in the blanks of the form shown above and he/she could make a document for the Router settings for his/her PC Lab.
Of course, he/she must know what kind of information he/she should give in the blanks, which is one of basic ICT literacy.

3-8 Before you complain and dissatisfaction

Many ICT teachers told me "We can't give any practical lessons for web page development and e-mail because we don't have internet access in our school".

But I dare say "If you have local network environment, you can do practices for web page development and e-mail".

How?

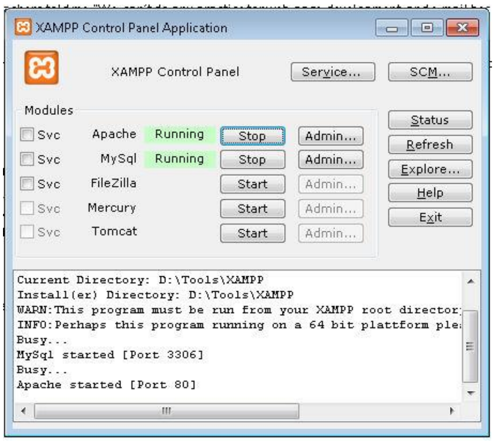
For web page development, I recommend to make a local web site by using XAMPP tool.
XAMPP tool consists of;

1. APACHE : free software for HTTP server
2. MySQL : free Data Base software
3. PHP : free web programming language
4. Perl : free web programming language

XAMPP : AMPP stands for **A**pache, **M**ySQL, **P**HP and **P**erl.
Leading '**X**' means 'cross platform', which means we can use this tool on UNIX, LINUX and Windows.
The tool specialized for Windows is called 'WAMPP'.

We can install XAMPP into a normal Windows PC and make local website on it.
After installation, we can consider the PC as a HTTP server, which means we can access to this web site on one PC in the local network from a browser on other PCs in the same network.

A picture below shows 'XAMPP controller' window, which is included in XAMPP tool.
We can define 'Document Root' on the PC just the same way as we do it on real web site.
In XAMPP environment, We can do everything that we can do on real web site.
Only with local network environment, we can learn and practice web site development.



For e-mail practice, you can use free GroupWare tool or such e-mail server software as 'hMailServer' (http://www.hmailserver.com/).

Anyway you, ICT teachers, need to search other solution and information in the internet before you complain on your environment.

4. Workshop for ICT education in Swaziland

Workshop in May, June

In the last term (July, 2012 – June, 2013), many ICT teachers told me “HTML is difficult to teach. For pupils, it seems difficult to learn HTML.”.

In the workshop in May and June 2014, I made a presentation on the topics shown below;

1. What are differences between HTML and WORD / Excel?
2. One example of effective way to teach HTML to your pupils/students

In addition, I touched a little bit on topics below ;

3. Some impressions on Cambridge Text
4. ‘Table Layout Design Technique’ HTML design technique shown in Cambridge Text

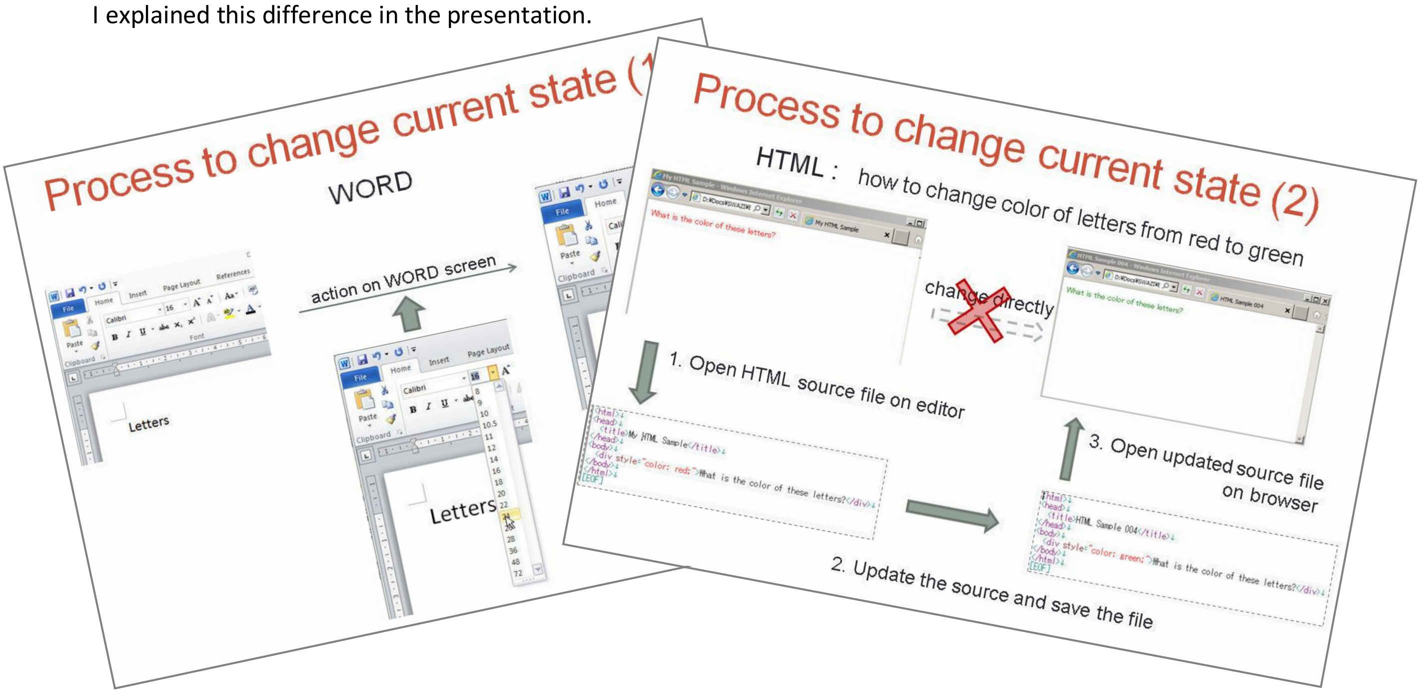
The workshops were carried out ;

1. 2014.5.26 Mhlatane High School / PiggsPeak
2. 2014.5.27 St. Marks High School / Mbabane
3. 2014.5.28 Everyn Baring Primary School / Nhlangano
4. 2014.5.30 Manzini Nazaren High School / Manzini
5. 2014.6.2 Siteki Nazaren High School / Siteki
6. 2014.6.3 U-TECH High School / Big Bend

4-1 Differences between HTML and WORD/EXCEL

When we use WORD or EXCEL, we can see the result of our action directly on the WORD screen.
But when we make some changes on web page (for example, change color of letters on web page),
we can’t change color directly on the web page shown on some browser. We need to update HTML source file, interpret HTML source by some browser and then we can get the result.

The differences are that HTML needs HTML source and to be interpret by Browser.
I explained this difference in the presentation.



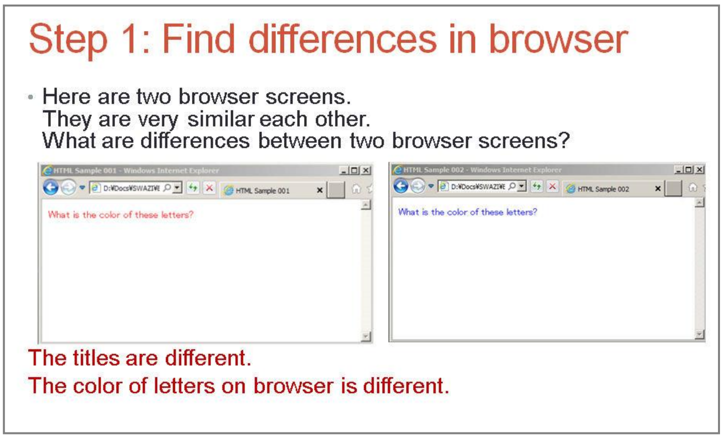
4-2 One example how to teach HTML to pupils/students

HTML has its own syntax and we must write a HTML source according to HTML syntax.
I explained briefly HTML syntax in my presentation. ICT teachers need to understand HTML syntax in detail, but pupils/students don't need to know every syntax in detail.
Pupils/students need to understand only such syntax as very often used in HTML.
In HTML, there are only two syntax shown below ;

1. <TAG> Content </tag>
2. <Tag />

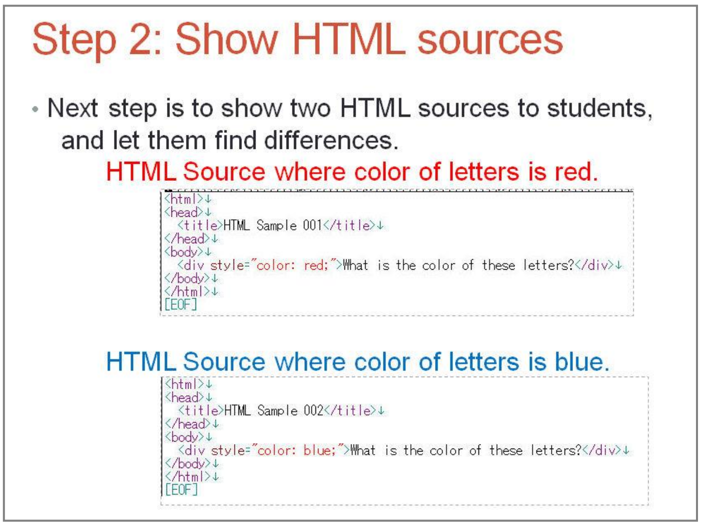
It's not necessary to remember HTML TAGs and Syntax of each TAG one by one.
I showed in the workshop one example how to teach HTML TAG and syntax.

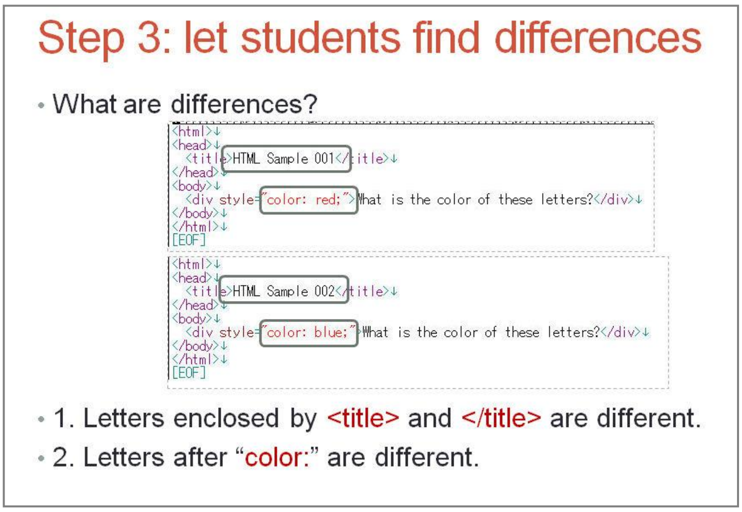
First, we prepare very simple example, just like a HTML source with only about 10 lines.
In the source, we should contain only one or two target TAGs, we remove other TAGs as possible as we can.
In HTML source, we prepare two sources with slight differences in target TAGs.
For example, it's just like pictures shown below. And let your pupils/students find differences on browser;



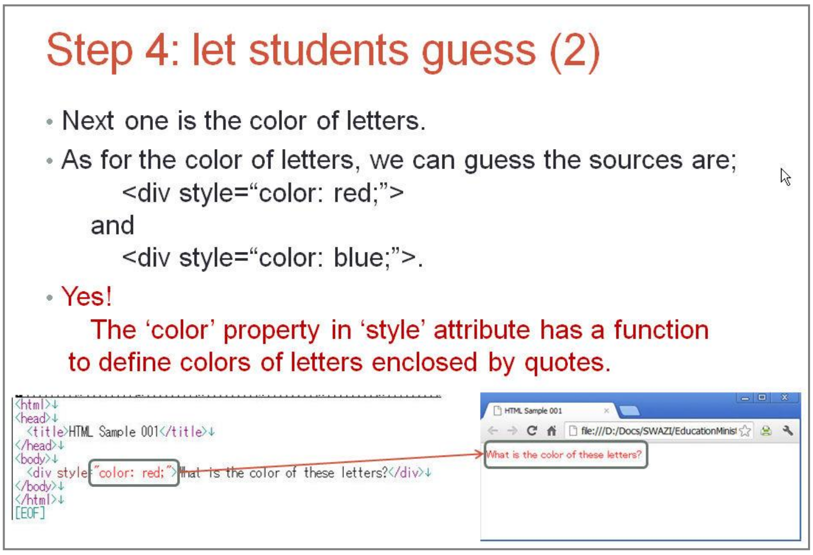
Teacher : "What are differences in these two browser screen?"
Pupils/students : "Color of letters. One is red and another one is blue."

This is the start point for HTML learning.
Next step ; Teacher can show two HTML sources to pupils/students, and ask the differences.





Next step is to let pupils guess the function of the target tags;
Teacher can ask to pupils/students "What do you think are the functions of these letters 'color;'?"
ICT teacher must not explain the 'TAG' at this point, he/she must let pupils guess it;

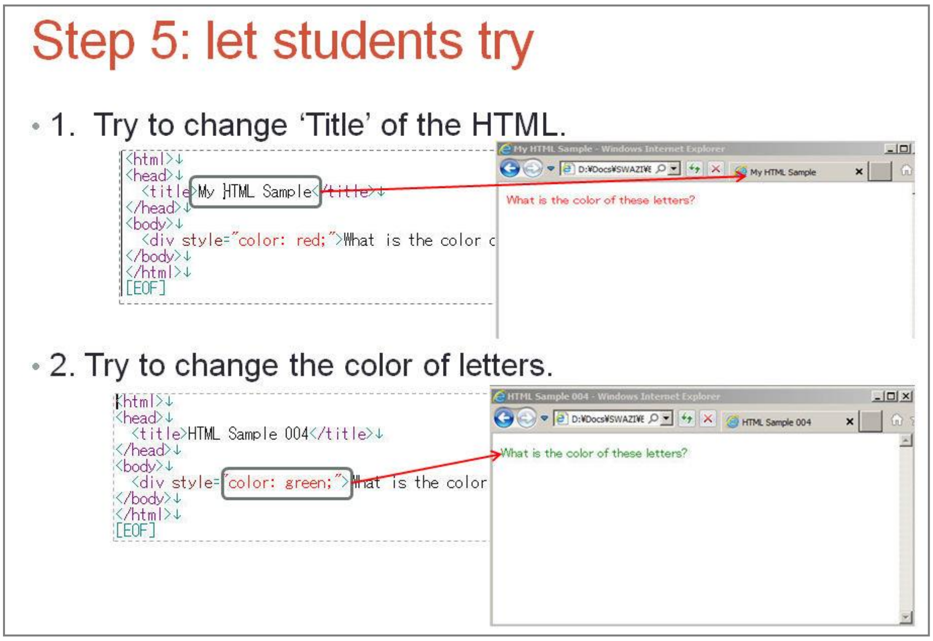


Teacher : Yes, one has letter 'red;' after 'color:', and the other has letters 'blue;'.
Then can you explain the function of this property 'color'?

Pupil/Student : 'Yes, the 'color' property in 'style' attribute has a function to define color of letters enclosed by quotes'.

Even if pupils/students can give correct answer, we should not finish the process, we proceed to next step.

Next step is 'to let pupil/student try other example to check whether our guess is correct or not'.



Teacher : 'OK, then shall we try another example? Let's try to change the color of letters into green.'.

If pupils/students have got understanding of the 'color' property, then they can change the color of the letters into green.

At this point, Teacher can give detail explanation on a property 'color'.

This process may seem to ICT teachers somehow troublesome. Yes, it takes more time than to give the explanation of the property directly.
But I think this is one example how ICT teacher could get pupil's/student's reaction and change the ICT class into two-way communication. Pupils/students will understand well HTML syntax slowly but certainly.

Important points are;
Let your pupils find for themselves
Let your pupils guess
Let your pupils try
Then you as a teacher can give an explanation.

This is one of view point by a Computer engineer not by a teacher, but I also once a pupils/student and I forgot almost all what my teacher taught to me, there's only a few knowledge which I've got for myself with some efforts.

As a teacher, your role is not to give knowledge to your pupils/students but to support your pupils/students to find, guess and try for themselves.

4-3 one suggestion to ICT teachers from Computer engineer's view point

In your ICT class ;

Always take care of your students whether they are too busy to follow your direction on the tools like FrontPage. Suppose you as an ICT teacher is giving a direction to your pupils like this;

"Click a box of cell padding in layout group, then type 6 in the box, do same in cell spacing box……"

Your students , do they understand what they are doing now?

Aren't they busy to follow your direction on the screen?

Do your students understand what 'cell padding' mean?

Can your students imagine what happens on the web page after changing cell padding into 6?

If you might find such cases in your class, then it means that you haven't taught HTML to your students, you may have taught only **'How to use tools'**.

Your students may know very well how to use FrontPage , DreamWeaver and other HTML authoring tools, but they don't understand HTML itself.

For beginners, it may be better to use text editor like 'NotePad' and you'd better show very simple example with at most 10 lines in HTML source and give only one topics(tag / attributes) in one example as I showed in previous chapter 5-2.

As I showed there, you'd better to let student;

1. see two samples (web pages) with slight differences on a browser
2. find differences on browsers for themselves
3. check two HTML sources and find differences on HTML sources
4. guess which tags/attributes causes differences
5. try other example for themselves by changing tags / attributes which they guess to be targets

After these steps, you may give detail explanation on Tag / Attributes.

Give your students a training to read HTML source.

When your students lean HTML by some tools, they will learn 'How to use tools', and not 'How to make HTML source lines'.

You, teachers must know **when your pupils/students study HTML by using some tools 'It is a tool not your students who generates HTML source with Tags and Attributes'.**

So, even when your students use some tool, please let them check and read HTML after every action on the tool; what tags / attributes are generated or changed.

4-4 What is lacking in Cambridge ICT Text

Every activity in ICT operation has three aspects, they are;

1. Why : why do we do it? What do we want to do by this?
2. What : what are possibilities / selections to do it? Are there any other options?
3. How : How can we do / realize it?

Suppose one case where we want to send invitation document for some meeting.

We want to inform participants the date, time and place exactly. This is **WHY**; to emphasize the date, time and place to give important information exactly to recipients.

Then what can we do to emphasize these important information on the invitation document?

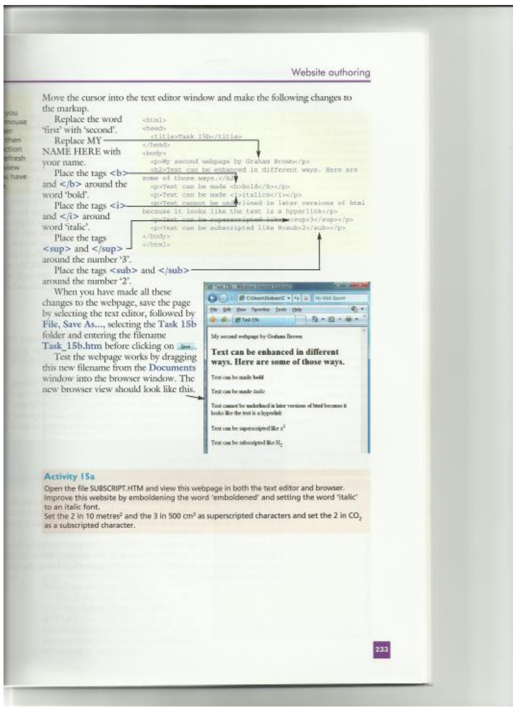
We can use bigger letters, we can make these letters in Italic, we can change colors of letters, we can give under lines to these information, and so on. We have several possibilities / selections to emphasize them. This is **WHAT**; We have selections to complete our purposes.

Suppose we might select to make letters bigger and underlined.

Now we are opening the door of '**HOW**' and from this point some tools like 'WORD' may concern.

The Cambridge text shows to learners only 'HOW', it doesn't refer to 'WHY' and 'WHAT'.

This is one point why student find it difficult to understand tools(WORD, EXCEL,HTML and so on) because they become too busy to follow your(teacher's) directions along with Cambridge text describing only 'HOW', so they can't understand 'why am I doing it now?', 'what am I doing now and for what?', it may demotivate your students.


Website authoring

Move the cursor into the text editor window and make the following changes to the markup.

Replace the word 'first' with 'second'.

Replace MY NAME HERE with your name.

Place the tags and around the word 'bold'.

Place the tags <i> and </i> around word 'italic'.

Place the tags ^{and} around the number '3'.

Place the tags _{and} around the number '2'.

```
<html>
<head>
  <title>Task 15b</title>
</head>
<body>
  <p>My second webpage by Graham Brown</p>
  <h2>Text can be enhanced in different ways. Here are some of those ways.</h2>
  <p>Text can be made <b>bold</b></p>
  <p>Text can be made <i>italics</i></p>
  <p>Text cannot be underlined in later versions of html because it looks like the text is a hyperlink</p>
  <p>Text can be superscripted like x<sup>3</sup></p>
  <p>Text can be subscripted like H<sub>2</sub></p>
</body>
</html>
```

When you have made all these changes to the webpage, save the page by selecting the text editor, followed by File, Save As..., selecting the Task 15b folder and entering the filename Task_15b.htm before clicking on Save.

Test the webpage works by dragging this new filename from the Documents window into the browser window. The new browser view should look like this.

Activity 15a

Open the file SUBSCRIPT.HTM and view this webpage in both the text editor and browser. Improve this website by emboldening the word 'emboldened' and setting the word 'italic' to an italic font.

Set the 2 in 10 metres^2 and the 3 in 500 cm^3 as superscripted characters and set the 2 in CO_2 as a subscripted character.

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So you'd better prepare some stories when you start a certain section on Cambridge text just as I showed here.

In other words, we need some different approach to learning, we can call it 'Problem solving approach'.

I'm not a professional teacher, so I can't say any more.

4-5 Some impression on Cambridge ICT Text especially on HTML

When I've read HTML part of the Cambridge ICT text, I've got some questions ;

1. Why don't they refer to 'XHTML'?
2. Why do they keep on using 'Table Layout Design Technique'?

[XHTML and HTML]

According to 'W3C schools' web site,

XHTML is HTML redesigned as XML

In detail,

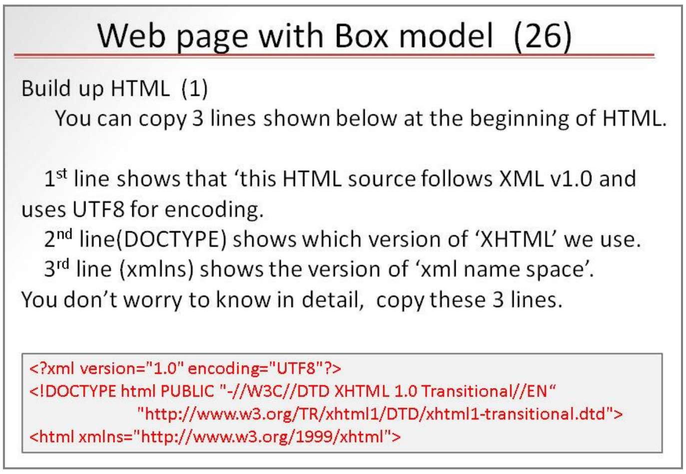
XHTML stands for E**X**tensible **H**yper**T**ext **M**arkup **L**anguage
XHTML is almost identical to HTML
XHTML is stricter than HTML
XHTML is HTML defined as an XML application
XHTML is supported by all major browsers
(from http://www.w3schools.com/htmL/html_xhtml.asp)

Now, XHTML is the main stream in web business.
for example,
TAG should be written as <br /> in XHTML.

It's not necessary for pupils/students to learn XHTML instead of HTML, because IGCSE exam follows the Cambridge ICT text. But for ICT teachers, they should know XHTML;

XHTML is the main stream in web business, not HTML.

And students who want to be a ICT professional in future days should know XHTML, too.



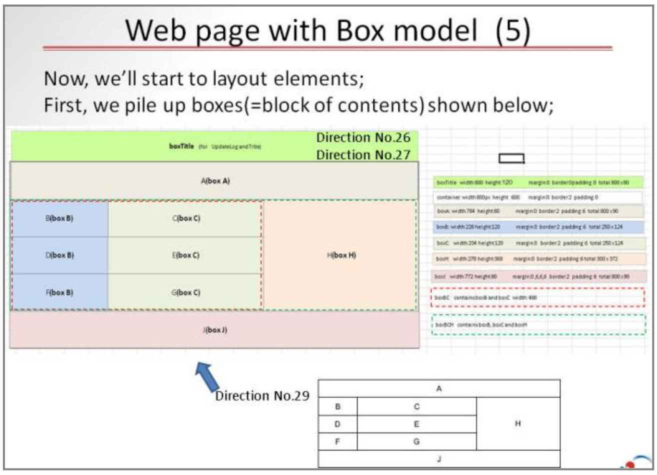
[Web page design technique]

There are two design technique in Web Page design;

1. Table layout design technique
2. Box layout design technique

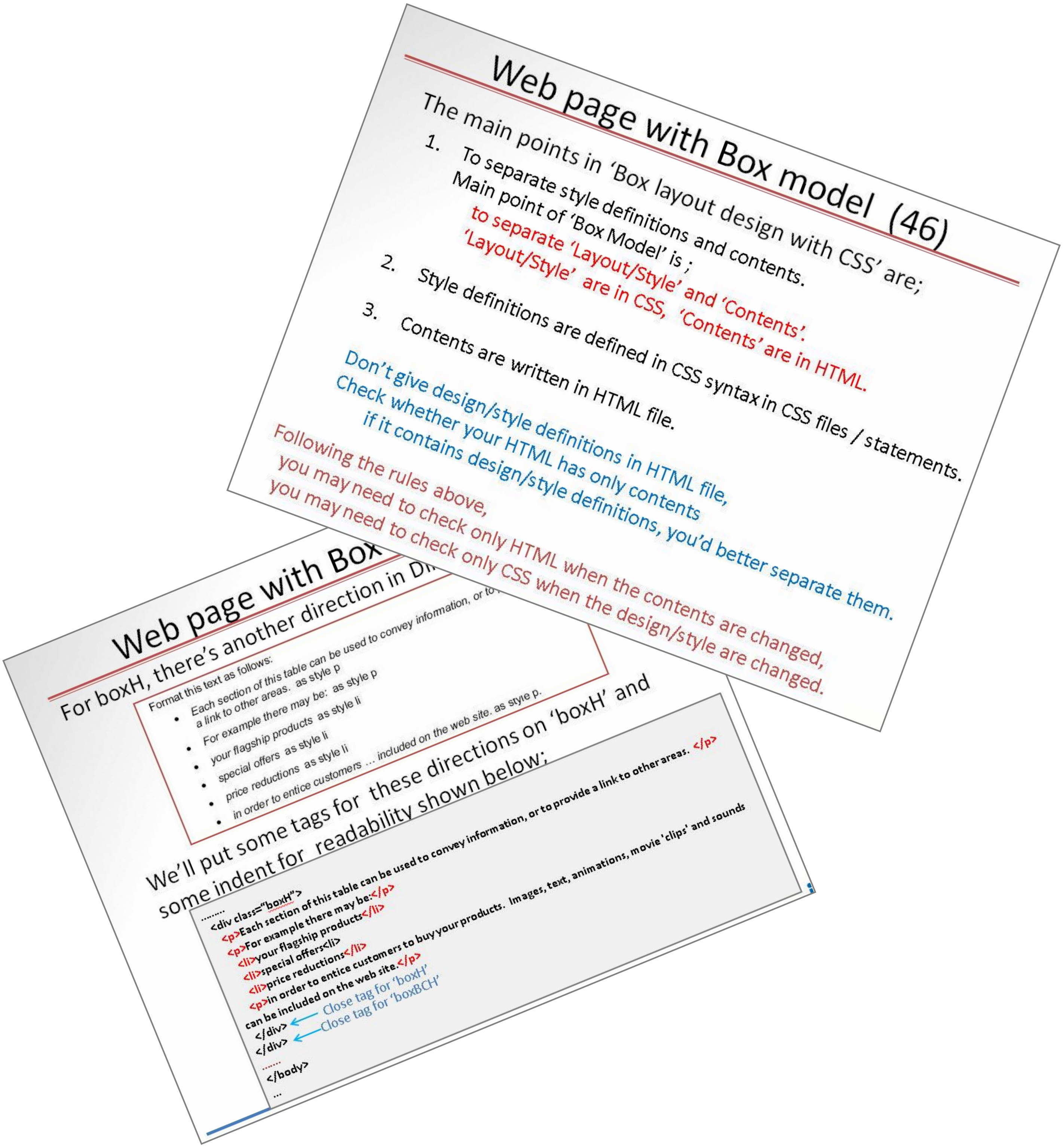
Now, 'Box layout design technique' is the main stream in web business.

Cambridge ICT text keeps to follow 'Table layout design' (See Page 255 '15.9 Using tables' in the textbook) and HTML part in IGCSE exam adopts 'Table layout design', so in schools we need to learn 'Table layout design technique'. But ICT teachers must know 'Box layout design technique' . And students who want to be an ICT professional especially a web design professional in future days must study 'Box layout design technique'. If he/she may keep to follow 'Table layout design



technique' in his/her company after he/she is employed, he/she might lose his/her job.

After this workshop, Mr. Armstrong Simelane, Regional Inspector ICT, asked me to make a presentation on 'Box layout design technique' someday. And I prepared one presentation which has more than 50 pages in Power Point and sent it to him.
We don't have an opportunity to have this presentation at a workshop, but I can offer this presentation file on your request.
This presentation includes one example where one question to make HTML file in IGCSE exam is solved with 'Box Layout Design' step by step, so ICT teachers can follow these steps and gain the technique easily.



5. ICT Syllabus for Primary & Secondary level Development

I participated twice in the workshop for ICT syllabus for primary and secondary level development, 23rd – 27th June 2014 and 1st - 5th September 2014.
I was just only one participant, which means I couldn't contribute so much to the work there.

Impressions / Findings

Mr. Musa Hlophe, NCC Senior Officer, has taken excellent control for productive discussion through the workshop with a good presentation and speech. He showed a wonderful leadership through the workshop.

All the participants have concentrated in discussion on the development of ICT syllabus for primary and junior secondary level.

Sometime I felt that the topics which were being discussed were somehow deep and difficult for pupils / students and I was afraid whether the theme or elements in the syllabus might become too deep or too technical.
But I'm sure that ICT teachers could understand all the strands in the syllabus and arrange them in good form into their ICT classes.

In the last term (July,2012 – June,2013), I've got a strong impression when I had a lecture of JAVA programming in the ICT course at SCOT (Swaziland College Of Technology). It seems not to concern with ICT syllabus, but I'd like to show one impressive scene;

In the class, there were about 30 students in the course. I gave one question to them in the first lecture ;
"Make one batch script to compile your JAVA programme."
Then, I've got one question from a student;
"What is 'Batch Script'?"

I was surprised at the question.
My first impression to this question from a student was ;
"Are you studying JAVA programming without knowledge of the term 'Batch Script'?"

Students there used one tool 'NetBeans' for JAVA programming, which gives us an editor window to write a JAVA source programme and give us hints what we should write next. Very excellent and kind tool.
But I asked student to write a JAVA programme on a text editor like 'NotePad', compile and execute them on a command prompt window using java and javac command. I tried it so that students there could understand how JAVA programmes are compiled and executed on some Operating System.
But I found that ;

1. Students in ICT course have not got any training on DOS/Windows basics.
2. All what they know were only 'How to use NetBeans'.

So, I tried to give them some training on DOS/Windows Basic such as ;

1. DOS/Windows commands
2. How to work on Command Prompt Window using DOS/Windows command.
3. How to make Batch Scripts using DOS/Windows commands.

And at the same time, I asked them to use a text editor like 'NotePad' to make JAVA source programmes.

Using tools like 'NetBeans' or 'Eclipse', these tools will give us;
A source code which should be written next
Selections to be selected in pulldown menu, so that we can find correct one easily.
And then we can make a correct programme very easily. We can say it's difficult to make miscoding.

But we must know that it is a tool not you, a learner, who has generated JAVA codes. Students has got one misunderstanding that 'I can make a JAVA programme' with JAVA codes generated by tools.
This is the same case as I described in the previous chapter 4-3. **When your students study JAVA programming by using some tools, you must know 'It is a tool not your student who generates JAVA programme codes'.**

So, I asked students;

1. Use text editor and type JAVA code yourself.
2. Compile your JAVA programme using 'javac' command and execute it using 'java' command.
3. It's good idea to copy a programme which is written by a professional programmer, but don't copy & paste them, always type them yourself on a text editor.

It's necessary process for students so that they can understand internal process to compile and execute one programme, which couldn't be understood by using tools.

From a view point as a software engineer, as for tools, I recommend;

1. For beginners, it's better to work on a text editor and command prompt window.
2. For middle class learners who know how a programme is compiled and executed, it's better for middle class learners to use a tool because of productivity view point.
3. For higher class learners, it depends on his/her taste. He/She can select 'text editor and command line' or 'tool' by his/her taste.

I know so many professionals return to use 'text editor and command line'
They get familiar with basic Windows environment by using text editor and command line, so when they might meet with some troubles, they can find 'what I must do now?' and 'Where I should check now?'.
Engineers who use always tools may disable to find 'what I must do now?' and 'Where I should check now?'.
Of course, high level engineers use tools for their productivity, but they can translate at the same time what they are doing on a tool into command line and text editor.

In SCOT, I'm not sure whether I asked them too much or not, but in an exam, I gave them one question to make a batch script. Among about 30 students, there was only one student who could give a correct script.

I showed one of my experiences here because I want you, as one of leaders in ICT education in Swaziland, to recognize that students might get into ICT course in a college or university without even basic DOS/Windows knowledge.
I suppose that students in ICT course in a college or university might want to be an ICT professional in future days and that they must be motivated so much.
Then I should say that it's an abnormal scene where we see such strongly motivated students studying in tertiary education without basic knowledge.

Suggestions / Recommendations

From my experiences as JICA Senior Volunteer ICT, I want to ask leaders in ICT education in Swaziland,

1. In High school, we can't have time to let pupils/students study DOS/Windows basics because we must follow 'Cambridge Text' which doesn't have such contents. So in a college or university, for students in ICT course, I recommend to include DOS/Windows basics (and UNIX/LINUX basics) for about half year in a college or university syllabus.

2. If possible, in high school syllabus, only for students who want to be ICT professionals in future days, I recommend to include DOS/Windows basics as additional topics in a syllabus, which are not topics for IGCSE exam.

In conclusion

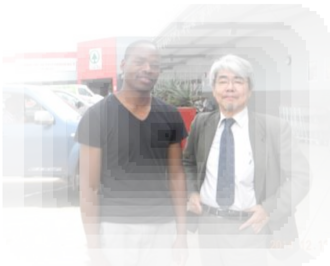
Special thanks to …..

I'd like to express special thanks to ;

Mr. Leonard M Tsela Senior Inspector ICT
As a counterpart, he supported me so much.
He supported me in planning and scheduling all my activities as JICA senior volunteer.
I appreciated so much his support for my transport even though I met difficulties so many times.

Mr. Bhekisisa Hlophe ICT teacher in St. Marks High school
Mr. Siphesihle Dlamini ICT teacher in Nokuthula High school

Two teachers helped me so much during the work at high schools to develop local network in PC Lab.
They joined us voluntarily to get knowledge and experiences on ICT skills during school holidays.
I'm sure they could be next leaders in ICT education in Swaziland.
They gave me kind and good memories. Thank you so much for your support.



Again I would like to express special thanks to my colleagues and kind memories in Swaziland.

23, January, 2015

Kenichi Tezuka

JICA Senior Volunteer ICT