



**I.T. Development Plan  
Version 2.0 (See Appendix 1: Version History)**

## 1. Prologue

From its inception in 2000 as a bilingual school with an international focus, Nelson Mandela School has striven to be a model for education in Berlin. Nelson Mandela School has become a comprehensive, whole day school and has successfully implemented a Flex system for Grades 1 and 2. The school provides students the opportunity to complete their education with a Mittlerer Schulabschluss qualification, Abitur qualification or, subject to meeting entry requirements, an International Baccalaureate qualification. Nelson Mandela School has always aimed to be at the forefront of education reform, and in recent years has begun to develop strategies for how Information and Communication Technology can be used to support the school's pedagogical vision.

In May of 2010 the I.T. Development Group of Nelson Mandela School was formed. This group, which includes members of management, staff, parents and students, has the core goal of implementing at Nelson Mandela School the objectives set out by the Berlin Senatsverwaltung für Bildung, Jugend und Sport's 2005 eEducation Berlin Masterplan. The goals of our I.T. Development Group include:

- Developing and implementing structures to support all students' achievement of required standards in I.T.
- Enhancing and supporting teaching and learning through the use of I.T.
- Creating a concept for the professional development of staff with regards to I.T. and the provision of ongoing training to establish and support necessary I.T. skills within the staff.
- Long-term planning for the use of I.T. including learning platforms.
- Developing a school-wide accessible collection of teaching resources and media.
- Short- to mid-term planning of I.T. infrastructure, with special consideration to connectivity and easily maintainable hardware (minimising the number of necessary school-server based images.)
- Developing a structure within the staff that ensures that developments in I.T. are constantly and consistently implemented throughout the school system.
- Enhancing and simplifying communication amongst the school community.
- Creating a culture of responsible use of I.T. and the Internet within the student body.

On 8 December 2011 on the recommendation of school management, the school's Gesamtkonferenz voted unanimously that the I.T. Development Group has a mandate to make

decisions regarding I.T. in the school. The I.T. Development Group is open to all members of the school community, with decisions being made by consensus.

In the 2012/13 school year, a curriculum for digital skills was developed for Years 7 to 10 of Nelson Mandela School, with a concept to extend this through I.B. and Abitur by 2015 (see Appendix 2: Curriculum Digital Skills NMS.)

This I.T. Development Plan demonstrates the current state of Information and Communication Technology in the school and provides a road map for how Information and Communication Technology could be implemented to better achieve the pedagogical vision of the school.

## 2. Foundation of I.T. at Nelson Mandela School

Nelson Mandela School was initially located on one campus at Pfalzburgerstr. 23. This campus was provided with a computer room consisting of 20 computers. Computer maintenance was provided where possible by teaching staff. For this reason, reliability of computer equipment at the school was poor. Over the years, this computer room was supplemented with donations of computers from parents, which were placed in classrooms. These computers varied widely in their setup, and due to the lack of maintenance were often not in a state that they were able to be utilized. As such, these computers were a source of complaint amongst staff, and were not commonly used to support daily teaching.

Due to the growth of the school, in 2005 it became necessary for the Secondary to move to a different campus at Kastanienallee, and the school would remain as two campuses in the future. This introduced new challenges, especially with the combined use and maintenance of I.T. between the two campuses. Additional resources are required above what would be needed if the school was on one campus. To support this, the Friends of Nelson Mandela School bought 20 computers to form a computer room for the Secondary campus. A collection of 25 second-hand computers were also donated to the school as a joint effort of a private company and the Friends of Nelson Mandela School, which were used to form a second computer room at the Primary campus.

In 2008 both campuses of Nelson Mandela School received servers as part of the eEducation Berlin Masterplan. As a Masterplan-Schule, the school also received 16 laptops.

In 2011 the Secondary moved to Pfalzburgerstr. 30. The school server and the computers from the computer room at Kastanienallee moved with the school. While building the new campus school authorities installed 13 interactive whiteboards with computers, and in cooperation with the Friends of Nelson Mandela School purchased 21 computers for use as a second computer room.

In 2011 the school was accepted into a number of programmes provided by the Berlin Senatsverwaltung für Bildung, Jugend und Wissenschaft as part of the eEducation Berlin Masterplan. These include "Berlin wird kreidefrei", a programme which will see every class in the Primary School and every classroom in the Secondary school receive an interactive whiteboard by 2015 (as of 31.12.2012, the school has received 20 interactive whiteboards as part of this programme.) The school also received 16 computers as part of the "Werden Sie Masterplan-Modellschule" which were used to replace the aging computers in the small computer room in the Primary. A number of laptops were also received as a result of the school being accepted into the "Werden Sie Berliner Schule 2.0" programme.

In 2011 school authorities provided computers for both the Primary and Secondary staff rooms, as well as one computer for every class in the Primary.

In 2012, the school received a large number of second-hand computers from Investitionsbank Berlin, such that we now have at least one computer in every classroom in both the Primary and Secondary.

In 2013, a branch of the Nelson Mandela School was founded with the intention of creating a new school using Nelson Mandela School as a model. The branch is called Nelson Mandela School Neo, and steps are being taken to provide the branch with I.T. equipment for the 2013-14 school year.

The achievement of I.T. learning objectives set out by the Berlin Rahmenplan were originally met through the efforts of teachers at each class level, and steps are being taken to combine these into a whole-school approach. The I.T. Development Group continues to work and make improvements in this area.

### 3. Current use of Information and Communication Technology

(See Appendix 3: Inventory of I.C.T. equipment at Nelson Mandela School)

Information and Communication Technology (I.C.T.) is being used to support teaching and learning at Nelson Mandela School. The current use of I.C.T. at Nelson Mandela School varies greatly between classes depending on staff competencies and availability of infrastructure. While the objectives stated in the Berlin Rahmenplan and eEducation Berlin Masterplan are being achieved, the use of I.T. at Nelson Mandela School is behind contemporary use in our society, however this is improving through the work of the I.T. Development Group. There still exists a gap between daily exposure to I.C.T. in normal life and at our school.

Students use I.C.T. for conducting research and to support project work. As a bilingual school, I.C.T. is essential in English-based lessons, where more traditional resources are at times not readily available. Educational software is used as additional resources for learning. Students are introduced to visual and digital literacies through the use of multimedia and the Internet to support learning objectives. The use of digital cameras are supported in the school, where students have the opportunity to present work in formats such as video and PowerPoint presentations, and also have their work valued by creating blogs. Recent projects have also seen I.C.T. support the international perspective of our school by forming relationships and sharing cultural backgrounds with other students from around the world.

Staff use I.C.T. in the school to research and prepare lessons. This is particularly important given the variety of programmes in the school, including the Abitur, International Baccalaureate, M.S.A., and International Primary Curriculum, where online resources are central to planning and preparation. Different learning styles are engaged in the school through the use of multimedia and PowerPoint presentations to support lessons. I.C.T. is used to support the joint role that home and school have in students' learning by improving communication through the use of email, the school website, and allowing insights into daily classroom life through the creation of class blogs.

There are a number of obstacles that are currently faced at Nelson Mandela School which are preventing a broader use of I.C.T. to achieve the school's pedagogical vision. Due to the large number of computers in the school, the age of some of these computers and the lack of support for automatic imaging of Windows 7 machines, maintaining the school's computers and providing I.T. support is a major issue. The school also has a wide range of abilities regarding the use of I.C.T. amongst the staff, with training varying from very limited to university level I.T. qualifications.

#### 4. Pedagogical Concept

In order to fulfill the pedagogical vision of Nelson Mandela School, the school needs to build on the current usages of Information and Communication Technology (I.C.T.).

A greater focus needs to be put on unifying our efforts to achieve the I.T. competencies stated in the eEducation Berlin Masterplan and the Berlin Rahmenplan. Our objective is that all students at Nelson Mandela School develop a responsible, reflective, and critical understanding of the use of I.C.T. to support their education and to broaden their perspectives. This means that a concerted effort is needed throughout the school to look at ways that I.T. competencies can be achieved through integration with the current curriculum, and developing resources to support this.

The school is currently trialling a learning platform in order to support teaching and learning. The platform should support cooperative, self-directed learning and provide opportunities for students' work to be valued. It should also allow for cooperative work between staff, including the development and sharing of resources to support learning objectives. Furthermore, the platform should allow for greater transparency and evaluation of the learning that is occurring in the school, and assist in the joint role that home and school has in supporting student learning by improving communication between the different members of the school community.

I.C.T. should be used to support teaching and learning at Nelson Mandela School. Students should have access to I.C.T. in the classroom as a tool for learning and to support self-directed learning. I.C.T. should be used to allow students' work to be reflected on and valued. Different learning styles should be catered for through the use of effective educational software, and through the use of audio and visual presentations supported by Information and Communication Technology. I.C.T. should also be used to support discovery learning, through the use of educational platforms and well-designed self-learning activities. The wealth of experience that students possess in this field should also be utilized and will be invaluable in driving I.T. development.

Nelson Mandela School believes in supporting the differing strengths of students, and providing a rounded education with a variety of experiences. Students should be given the opportunity to explore their creativity, and have the opportunity to develop skills required for today's workplace in general and specifically in creative industries. To support this, the school needs to provide resources for students to interact with audio and visual processing equipment and software that is mainstream in these fields.

I.C.T. will be used to support project work. The international perspective of Nelson Mandela School is supported through the use of Information and Communication Technologies by allowing relationships to be developed with other schools throughout the world, and cooperative projects to be developed. I.C.T. should also support the comprehensive nature of the school, with eLearning projects developed which support partnerships between Primary and Secondary.

The school libraries (one library at each of the Primary and Secondary campuses) form a key role at Nelson Mandela School as research and resource centres for students and teachers, and will therefore be an integrated and central part of our I.T. structure. Our concept of library integrates all common library functions as well as I.T. inventory, booking of rooms and equipment, and a repository of digital resources. Daily work will be eased by online access to these services.

## 5. Competency Profile of Colleagues

Currently at Nelson Mandela School there is a wide range of competencies amongst staff relating to Information and Communication Technology (I.C.T.), from very limited to university level I.T. qualifications. This presents a challenge, as an adequate base-level of competency is required by all staff if Nelson Mandela School is going to achieve its pedagogical vision. This also presents an opportunity, as many staff at the school already have high-levels of competency relating to I.C.T., and some have experience with training teachers to use I.C.T.

Training in the school has commenced to try and narrow this range of competencies. An I.T. Study Day was conducted in early 2012 in the Primary School, which involved a number of sessions run by internal and external experts. On-going training in a number of areas is being provided at both the Primary and Secondary by internal experts, and where necessary and possible external experts. Our I.T. experts amongst the student body have not yet been utilized to assist with staff training, however given the overwhelming support for this amongst staff, this will be an avenue that the I.T. Development Group will pursue.

## 6. Requirements

In order to achieve our pedagogical vision for the use of Information and Communication Technology (I.C.T.) at Nelson Mandela School, the school needs to continue to make changes and overcome obstacles.

To accelerate the attainment of a base-level of competency amongst staff, continued efforts at staff training utilizing both internal and external experts need to be made. The school should also utilize the I.T. experts amongst the student body for staff training. (See Appendix 4: Training outline and opportunities.) Programmes of peer-mentoring and support need to be formalised. Training should be ongoing, to ensure that a base-level of competency is reached and maintained. Furthermore, the emphasis of training should be on providing skills that staff will be able to utilize immediately on a day-to-day basis.

To support teaching and learning, a catalogue of educational software and resources needs to be developed and maintained, including examples of how Information and Communication Technology can be used to meet the required objectives.

Computers at Nelson Mandela School need to be standardised further, and updated when needed. Standardising the computers at Nelson Mandela School is essential as it reduces maintenance time, ensuring that computers in the school are kept working, updated, and secure. Aging computers at Nelson Mandela School need to be updated to ensure that they are compatible with learning platforms and educational software that we wish to incorporate at the school. Thanks to the school's acceptance in programmes from the Senatsverwaltung für Bildung, Jugend und Wissenschaft, as well as the continuing support of school authorities and the Friends of Nelson Mandela School the I.T. infrastructure is almost at the level required to meet our pedagogical vision. However we still require:

- A printer, speakers, and a webcam for each classroom or department.
- A projector or interactive whiteboard in each classroom (this should be achieved through the "Berlin wird kreidefrei" programme.
- A studio in the Secondary, with computers suitable for audio and visual editing, along with specialised software and equipment.
- W-LAN access in both campuses.
- Gigabit switches for connecting school computers to the servers.
- Broadband connection with sufficient bandwidth to support multiple groups working on data-intensive projects.

Furthermore, we need continued investments in learning software, a learning platform, and a management information system. The school is expecting to be provided with the management information system "Magellan" in 2013, while a one year trial of the learning platform "itslearning" is expected to begin in 2013.

(See Appendix 5: I.C.T. Infrastructure Requirements for Nelson Mandela School)

## 7. Summary

Nelson Mandela School is a young school which has developed from a small beginning to a large and complex system in a little more than ten years. The development of pedagogical and organisational structures has been very successful due to the amount of creativity and commitment of all staff members over the years. We are now in a position to build on this strong basis using the I.T. knowledge and support of staff members to move the school forward as a whole. The school community has already made a huge step forward with regard to I.T. use, and has taken this step as a whole school. New expertise and existing expert knowledge have come together and are ready to work together for this common goal. This I.T. Development Plan is our continuing statement of great willingness to proceed and we need and welcome all possible support from school authorities.

## Appendix 1: Version History

### Version 1.0

First edition of the Nelson Mandela School I.T. Development Plan.

### Version 2.0

Second edition of the Nelson Mandela School I.T. Development Plan, with substantial changes reflecting the developments in the school in the two years since the first edition was written.

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# CURRICULUM DIGITAL SKILLS NMS

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## GRADE 7

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### **Module 1: Software Skills**

- Word Processing
- Spreadsheet
- Presentation
- (Open) Office Applications

### **Module 2: Safety**

- Privacy
- Cyberbullying
- Safe use of social media

### **Module 3: Internet**

- Functions
- Browsing for research
- Using Social Media (Blogging)

## GRADE 8

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### **Module 4: Computing**

- Hardware
- Functions of Computer

### **Module 5: Digitization**

- Role in society
- Copyright
- Plagiarism & fraud

### **Module 6: Introduction Programming**

- Scratch
  - Introduction HTML
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## GRADE 9/10 (WPU)

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### **Module 7: Tablets / Mobile Technologies**

- Changes
- Possibilities

### **Module 8: Audiovisual Skills**

- Photography
- Image editing (Photoshop/Gimp/)
- Video editing

### **Module 9: Multi-Media Project**

- Development & execution of a multi-media project in teams, using the skills and implementing the tools from Modules 1-8.

## ABITUR/IB

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A 'Leistungskurs' Digital Skills with a stronger focus on programming skills could be in place by 2015, potentially in cooperation with international IT companies.

Suggestion: Teachers focus on one or two modules per year and swap groups after half a year.

## Appendix 3: Inventory of I.T. equipment at Nelson Mandela School.

### Primary

#### Classrooms in Flex to Year 4

- Promethean interactive whiteboard
- Computer (from 2011 or 2012) running Windows 7

#### Classrooms in Year 5 to Year 6 and Free-time rooms in Flex to Year 4

- Computer (from 2011) running Windows 7

#### Computer room 106

- Promethean interactive whiteboard
- 17 computers (from 2011) running Windows 7
- Colour inkjet printer

#### Computer room 1.1

- Digital projector
- 27 computers (from circa 2000) running Windows XP
- Colour inkjet printer

#### Science room

- Promethean interactive whiteboard
- 1 teachers computer (from 2011) running Windows 7
- 13 computers (from 2012) running Windows 7
- Colour inkjet printer

#### Staff room

- 5 computers (from 2011)
- Black and white A3 laser printer

#### Shared resource

- 2 laptops and digital projectors

## Secondary

Rooms 107, 109, 112, 203, 205, 208, 209, 211, 306, 312, 0.4, 0.8, 1.2, 1.7, 1.8, 2.3, 2.7

- Promethean interactive whiteboard
- Computer (from 2011) running Windows 7

## Computer room 201

- Promethean interactive whiteboard
- 21 computers (from 2011) running Windows 7
- Black and white laser printer

## Computer room 207

- Promethean interactive whiteboard
- 20 computers (from 2011) running Windows 7
- Black and white laser printer

## Remaining classrooms

- Computer (from circa 2000) running Windows XP

## Library

- 11 computers (from circa 2000) running Windows XP

## Staff room

- 6 computers (from 2011) running Windows 7
- Black and white A3 laser printer

## Staff Quiet Work room

- 4 computers (from 2011) running Windows 7
- Black and white laser printer

## Shared resource

- 45 laptops
- 4 digital projectors

## Appendix 4: Training outline and opportunities

### Areas for Professional Development

1. Training on how teachers can use existing school software to manage current IT setup in the school:
  - Features of server software for teachers (e.g. resetting passwords for students.)
  - Use of monitoring software in computer rooms.
2. General IT training
  - How to use a computer.
  - Basic Internet training
  - How to use email.
  - How to use productivity programs, e.g. Microsoft Word, PowerPoint, LibreOffice.
3. Use of IT to support teaching and learning
  - Using IT to support differentiation
  - Use of IT to support different learning styles
  - Use of IT to support cooperative learning
  - Use of IT to support project work
  - Use of IT to support the international perspective of NMS (eg. projects with schools from other countries.)
  - How IT can be used to support reaching the objectives of the Berlin Rahmenplan.
  - Use of interactive whiteboards
4. Issues relating to IT in schools
  - Internet safety
  - Cybermobbing

### Possibilities for Professional Development

1. Internal training
  - Workshops run by staff of the school
  - Workshops run by parents of the school with experience in the IT industry
  - Workshops run by students
  - Peer mentoring system
  - Classroom observation
2. External training
  - Volkshochschule
  - Seminars run by the Senat
  - Workshops run by CBB
  - Workshops run by CIDS
  - Workshops run by paid experts

## Appendix 5: I.C.T. Infrastructure Requirements for Nelson Mandela School

- 12 interactive whiteboards for remaining classrooms in Primary
- 12 interactive whiteboards for remaining classrooms in Secondary
- Broadband internet connection with a minimum 50Mbit/s VDSL connection at both campuses.
- WLAN access points in both campuses.
- Gigabit switches connecting computers at both campuses to their respective servers.