# The use of Digital Technology

## Carol Mare - Long Bay College - Sabbatical May - July 2013

## Acknowledgements

## Executive summary

I chose to focus on:

- How digital technology is used, specifically in the Technology area of the NZ curriculum.
- Whether  schools are finding there is an overlap of software used and if so, how do they facilitate this overlap.
- How schools are changing the spaces where digital technology is being used.
- How we can modify our spaces to meet the needs of technology in the 21st Century.

My first task was to contact schools in California, New York and London and request the possibility of visiting schools in these areas to discuss the issue with them. However, after emailing numerous schools overseas it became apparent that some schools were reluctant to have visitors as my emails were not responded to which was rather disappointing.  Six schools were happy for me to visit which was pleasing.

It became evident that the curriculum in the United States and UK was significantly different to NZ both in course requirements and external examinations to gain University Entrance. It was apparent that getting access to online courses and units of work is still in its infancy stage, although there are a number of institutions who have developed apps on the iPad to address this.  Apps such as iTunes U and Khan Academy, now offer courses free to students.

## Purpose, Rationale and Background information

1. To investigate how other schools address the physical environments for the following subjects:
   - Digital Information Technology
   - Design and Visual Communication
   - Photography
   - Media Studies
   - Technology – Engineering/Wood/Auto
   - Electronics
2. How schools address issues of subject overlap
3. To forge relationships with institutions to assist with the development of and access to online courses and units of work to further supplement and develop appropriate pathways for students – making sure they have somewhere to go after school.

## Activities undertaken (methodology)

- Photographing environments
- Gaining course information
- Making contacts which would allow our students to join courses online.

## Findings — Edison High School—Los Angeles

Edison is a public High School established in 1969. It is co-ed and the year groups are grades 9 – 12. The number of students attending currently is 2200 and 61% are white. The school receives less funding due to the socio-economic area.

The curriculum offered to students: Total credits required: 220, including 155 credits from required courses. Required courses: (One year = 10 credits/One semester = 5 credits)

| | | Cred-its | Semesters (5 credits) |
|---|---|---|---|
| English | 4 years | 40 | 8 |
| World History | 1 year | 10 | 2 |
| U.S. History | 1 year | 10 | 2 |
| U.S. Government | ½ year | 5 | 1 |
| Economics | ½ year | 5 | 1 |
| Mathematics (Must include completion of Algebra 1) | 3 years | 30 | 6 |
| Physical Science | 1 year | 10 | 2 |
| Life Science | 1 year | 10 | 2 |
| Health | ½ year | 5 | 1 |
| Physical Education | 2 years | 20 | 8 |
| Visual/Performing Arts or World Language or CTE | 1 year | 10 | |

There is an adequate network infrastructure in place at the school. The library and two general computer labs are used by various subject areas for research and output of work eg Word, PowerPoint etc. There are two specialist computer labs used by Visual Arts/Design/Media studies, which have Apple Mac computers and students can access Adobe software. A wireless network is also available to all students. The layout of the computer labs is determined by the nature of the room and the furniture available and therefore is set out in traditional format. The school is still in the beginning stages of BYOD.

## The subject environment at Edison High School

The nature of the premises is blocks surrounding the circumference of the property. A noticeable aspect was that there were no windows in any classrooms. Only classroom doors have a small window and all classrooms have air conditioning.

- Digital Information Technology, Design and Visual Communication, Photography and Media Studies are housed in computer lab with Apple Mac computers set up in a traditional format. Students have access to one industry standard recording video.
- Visual Art is offered in the traditional format not yet making use of technology.
- Technology – Engineering/Wood/Auto is not offered at Edison
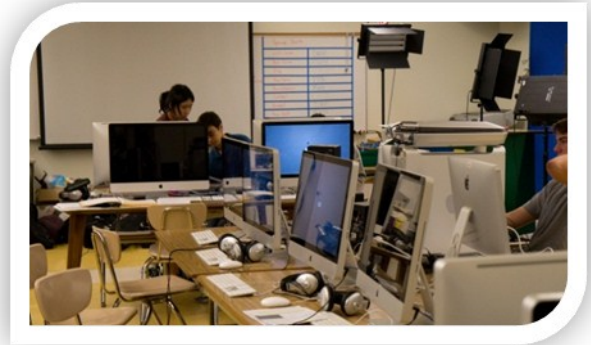- Electronics – is not offered at Edison

Appendix A – Edison High School - Los Angeles
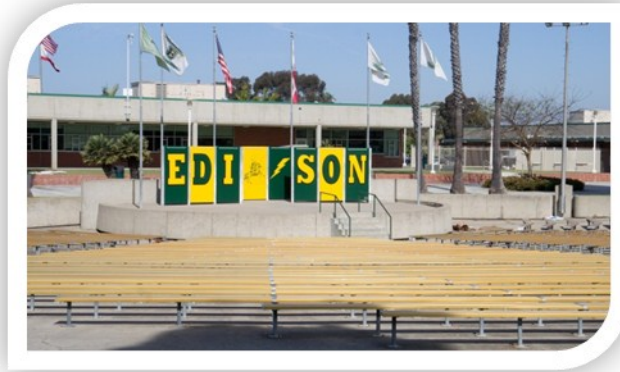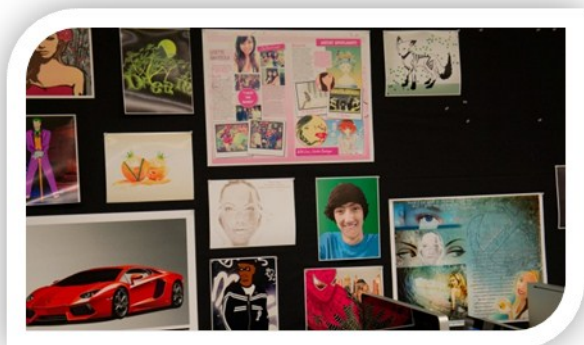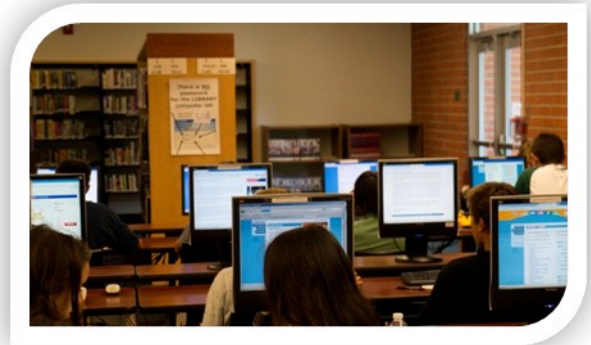


**Outdoor facilities**
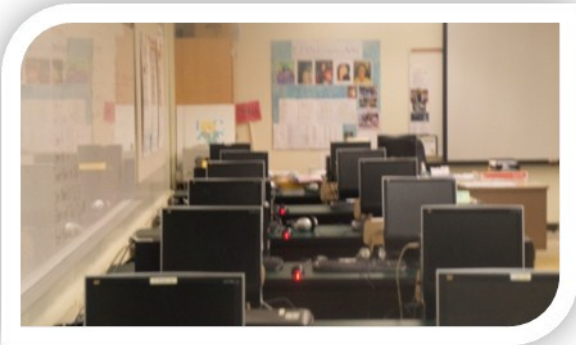


**Computer lab**



**Design lab**



**Computer lab**



**Outdoor facilities**



**Student Work**



**Library**

# Westminster High School—Los Angeles

Westminster is a public High School established in 1959.  It is co-ed and the year groups are grades 9 – 12 and number of students 2400. The racial makeup of the student body is approximately 41.3% Asian, 39.1% Hispanic, 12.8% White, 3.5% American Indian or Alaska Native, 1.5% African American, and 1.4% Pacific Islander.  Due to the socio-economic area the school gets substantial funding.

At Westminster they do not experience subject overlap.  Due to the nature of the curriculum at the school, students who participate in Drama make use of the recording studio.  The Media Studies department tends to focus on print media as opposed to film media.

The school is well resourced and has a comprehensive network with 1000 computers, a ratio of almost 1:2.  They are hoping to negotiate a contract for tablets in 2014 so that they can have a 1:1 ratio access to technology.  The computers are mainly Apple Mac with a single lab of PC's in the library. The Media Studies department has access to four industry recording video machines which is a major asset.  The Drama facilities were recently revamped and include a modern recording studio with an impressive sound board.  A wireless network is also in place and all students have access to this.

## The subject environment at Westminster High School

The buildings at Westminster High School are set in blocks. The school was originally an all boy's school with the focus on vocational subjects.  The woodwork and automotive classrooms are large and appear to be an exciting place for students.  In order to accommodate students in woodwork classes, the classes are multi levelled so seniors are able to assist juniors and students work together on group projects.

- Digital Information Technology: Use Apple Mac and students are exposed to Adobe and MS office software
- Design and Visual Communication: Not offered
- Photography: Not offered
- Media Studies: Use apple computers and the adobe suite
- Visual Art:  Offered using the traditional format, not using digital format yet.
- Technology – Engineering/Wood/Auto: Have great facilities, however looking at adding technology as an aspect of the subject. Computer lab with Auto cad and other software related to Woodwork and Automotive.
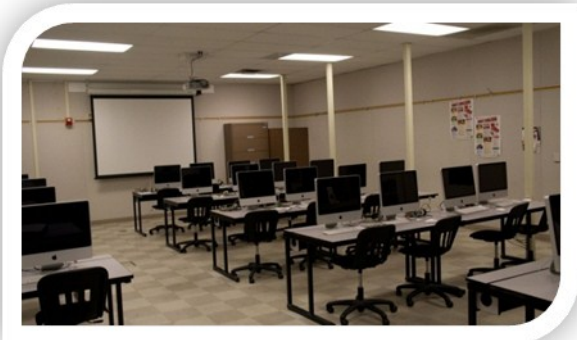- Electronics: Not offered
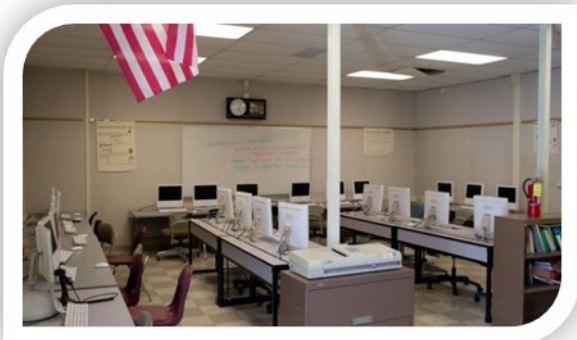
**Media Studies Lab**



**Media Studies Lab**



**General lab**



**General Lab**



**Library general lab Pc's**
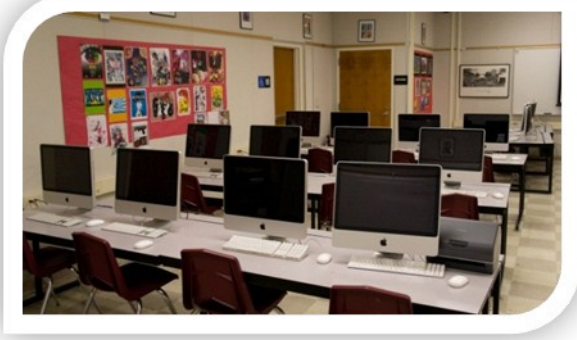


**Apple Mac Computer lab**



**Wood work facility**
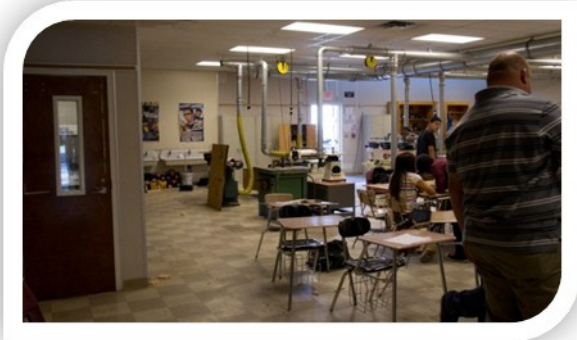


**Wood work facility**
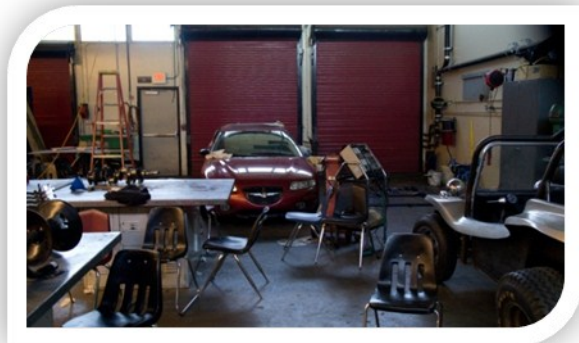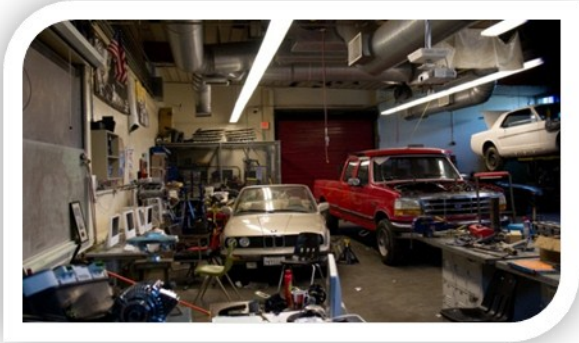
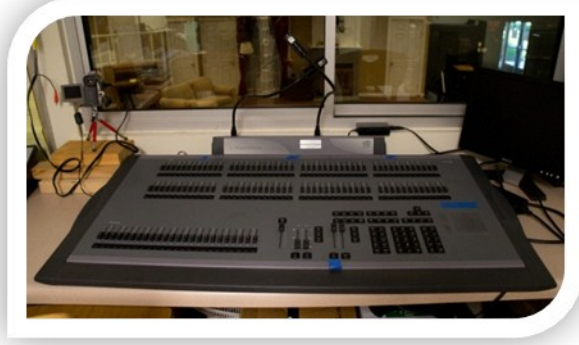**Automotive facility**
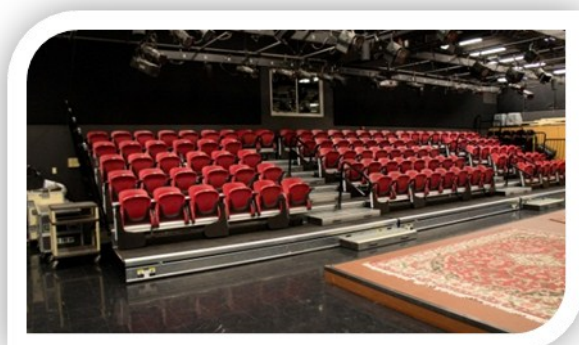


**Green room facility**



**Industry video camera**



**Sound and lighting board**



**Sound and lighting board for theatre**



**Theatre space**

# Mata Dei High School—Los Angeles

Mata Dei is a private Catholic High School established in 1950. It is co-ed and the year groups are grades 9 – 12. The number of students attending currently is 2000 and the population makeup of the school is 41% White; 2% Black; 27% Hispanic; 19% Asian; 16% other or undeclared.

The school has a comprehensive network system giving students access to wireless network to accommodate their iPad programme. All students at the school receive an iPad at the beginning of the year at a cost to parents of $350 on issue and non-refundable. When students leave the iPad is returned to the school. At the end of each school year iPads are stored away.

The curriculum available to students:

|  | Freshman Year (Year 9) | Sophomore Year (Year 10) | Junior Year (Year 11) | Senior Year (Year 12) |
|---|---|---|---|---|
| 1 | Religious Studies | Religious Studies | Religious Studies | Religious Studies |
| 2 | English | English | English | English |
| 3 | Mathematics | Mathematics | Mathematics | Social Studies |
| 4 | Science | Science | Social Studies | Elective |
| 5 | Modern & Classical Language | Social Studies | Elective | Elective |
| 6 | Visual & Performing Arts or Elective | Modern & Classical Language | Elective | Elective |
| 7 |  | Elective (optional) | Elective (optional) | Elective (optional) |

Because of the nature of the curriculum subject overlap does not occur as students do electives one year at a time.

The following **ONE YEAR** electives are offered to students in Technology:

Student Technology Aide:  Year 10, 11 and 12
Computer Science: Year 11 and 12
Design:
Contemporary Media I:
Contemporary Media II:
Media Studies:
Numerous one year Visual Arts electives available to students including ceramics.
Technology – Engineering/Wood/Auto is not offered at Mater Dei
Electronics – is not offered at Mater Dei

## The subject environment at Mata Dei High School

The school buildings are built along the perimeter of the school with an open square in the middle. The building is two levels and classrooms are in the traditional format. The library/media centre has been revamped recently giving students a space which has technology available to them.
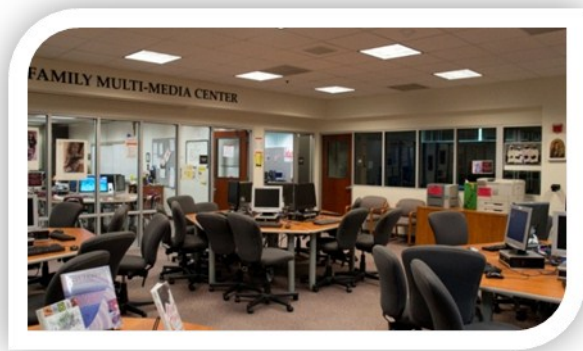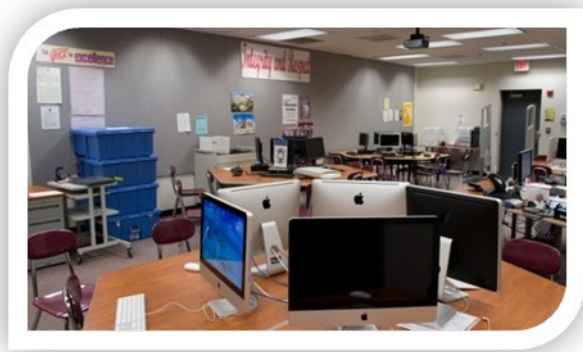
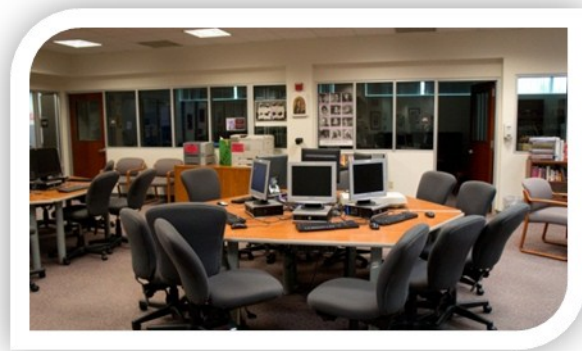**Multi Media Centre**



**Apple Mac computer lab**



**Multi Media Centre**



**Multi Media Centre**



**Multi Media Centre**



**Storage boxes for the iPads**

# Stuyvesant High School—New York

Stuyvesant is a public High School established in 1904.  It is co-ed and the year groups are grades 9 – 12.  The number of students attending currently is 3300. The racial makeup of the student body is approximately 72.05% Asian and 23.55% Caucasian, 1.21% African American and 2.43% Hispanic. The school is a Specialised High school which means students who attend the school only gain a place by completing an admissions test for which this school has the highest cut-off score.  Students are not allowed to bring cell phones to school; this is an education board ruling.  However, laptops and tablets are allowed.

The curriculum includes:

|  | Freshman Year (Year 9) | Sophomore Year (Year 10) | Junior Year (Year 11) | Senior Year (Year 12) |
|---|---|---|---|---|
| 1 | English | English | English | English |
| 2 | Social Studies | Social Studies | Social Studies | Social Studies |
| 3 | Science | Science | Science | Science |
| 4 | Mathematics | Mathematics | Mathematics | |
| 5 | World Languages | World Languages | World Languages | |
|  | Physical Education (4 semesters) | | | |
|  | Technology (4 semesters) | | | |
|  | Music (1 semesters) | | | |
|  | Fine Art (1 semesters) | | | |
|  | Health Education (1 semesters) | | | |
|  | Senior Year Electives (2 semesters) | | | |

The current building housing the school was built in 1992.  It is a ten storey building located in the financial district of Battery Park and overlooks the Hudson River.  The school has lifts, escalators and stairs which allows for quick transitioning between classes for students.  The school has a fantastic theatre with 800 seats.  The layout of classrooms is in the traditional format.  The library was renovated in 2005 and provides a more open plan environment for students.

- Digital Information Technology: Use PC's and MS office software
- Design and Visual Communication: Offered - traditional format
- Photography: Offered – traditional format
- Media Studies:  Have a green room
- Visual Art:  Offered using the traditional format, not using digital format yet.
- Technology – Engineering/Wood/Auto: Not offered.
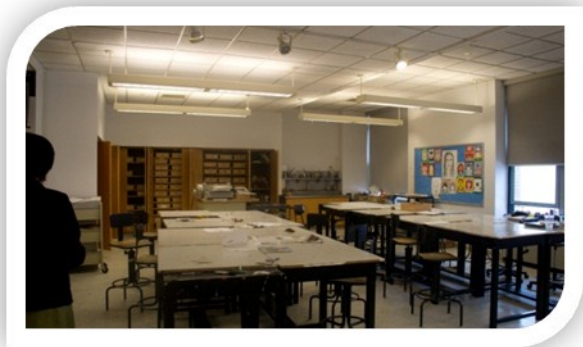- Electronics: Not offered
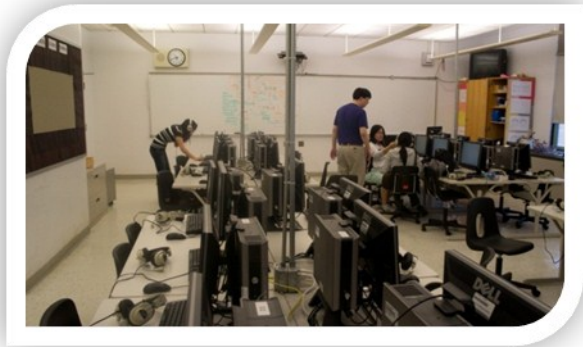
**General Computer Lab**

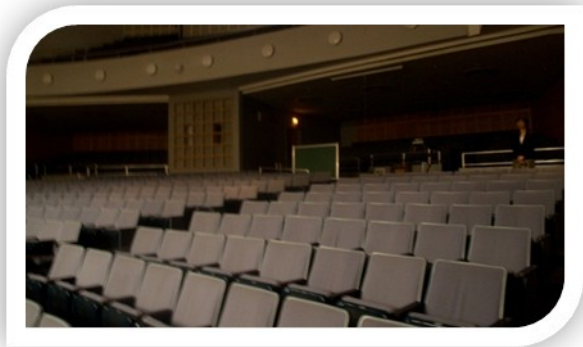

**General Computer Lab**



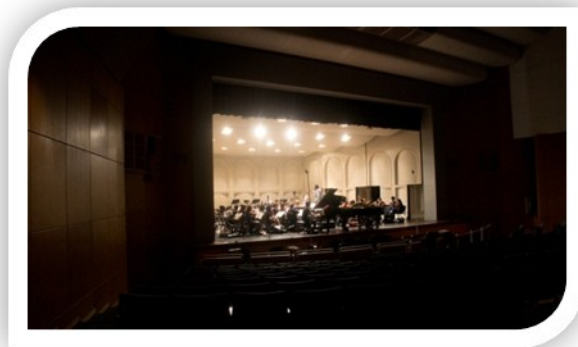**Art space**
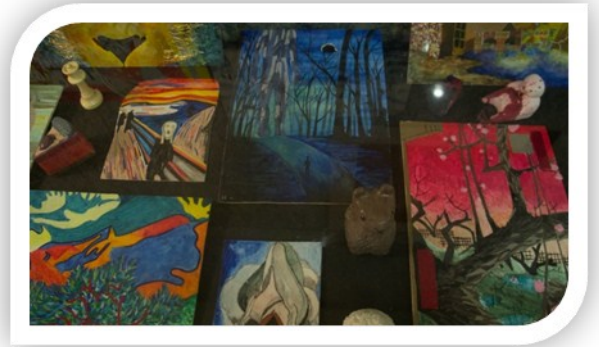


**Student work**



**Theatre seating for 800**



**Green room facility behind theatre**



**Theatre stage**

**Langley Academy—London**

Langley is a public High School established in 2008. It is co-ed and the year groups are Years 7 – 12. The number of students attending currently is 2000.

The curriculum includes: (*Extract from the school website*)

**In Years 7 – 11**

Students are offered a wide range of subjects and will have access to the following: Maths, English, Science, PE, ICT, Design Tech, Music, Drama, Art, Geography, History, French, Religious and Personal Studies in their first two years.

In Years 9, 10 and 11, students prepare to sit GCSE examinations and in so doing are taught how to balance their work load.

In Year 10, students have the opportunity to explore potential future careers by attending work experience for one week and this is supported by career workshops and guidance.

Year 11, students are provided with tasters of what 6th Form life would be like.  This is to encourage them to pursue further education, whether academic or vocational and to start making informed choices about their post-16 lives. In preparation for their examinations, students are provided with regular revision sessions during half-term holidays and weekends in the lead up to each period.
I
**n Years 12 – 13 (6th Form)**

Langley has study facilities, within the dedicated 6th Form Centre.  This is to ensure that students have the best possible resources for independent study and research.

The school network infrastructure is maintained by four fulltime network technicians, two junior and two senior employed by the school.  Students are sent to the technicians to deal with network issues and network discipline issues.

**The subject environment at Langley**

Langley is a new building and the design needed to be a functional, modern and exciting place where students would want to come to school.  The building is two storeys with open plan atrium area.  All classroom spaces are glass and visible from the atrium and corridors.  The main focus is Science and consequently the Science labs are circular in the main atrium of the school and a focal point as you enter the school.  The school has a philosophy that students need to explore and therefore many aspects of the building have purposely been displayed in a way that students can see how the building has been constructed.  The school has a museum feel about it and to enhance this feel, has many displays throughout the school which have been borrowed from museums and parents.  These displays are changed regularly and reflect the content of the teaching.  From the photographs it can be seen that the furniture is fun and quirky.  The school consists of three floors with computer spaces at the end of both wings on each floor.  The library is situated on the ground floor between the two wings and can be seen from all floors.  This leads to a lunch room situated off the main foyer area.

Currently media studies focuses on print media and at Year 11, students make use of power point to create their print media.  The teacher is hoping to get more facilities next year so that they can incorporate film media in the curriculum.

- Digital Information Technology: Use PC's and students are exposed to Adobe and MS office software
- Design and Visual Communication: Not offered
- Photography: Not offered
- Media Studies: Use apple computers and the Adobe suite and PowerPoint.
- Visual Art:  Offered using the traditional format, not using digital format yet.
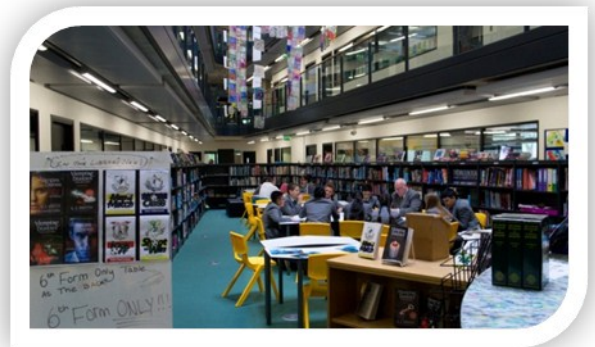- Technology – Engineering/Wood/Auto: not offered
- Electronics: Not offered

**Front of the school**



**Atrium and office spaces**



**Science spaces**



**Library**
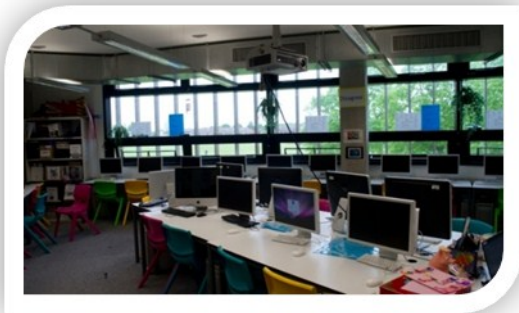


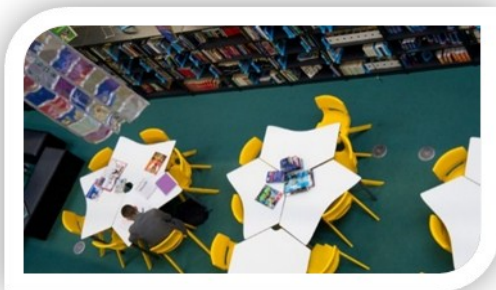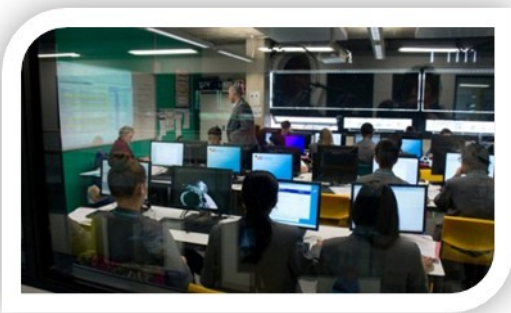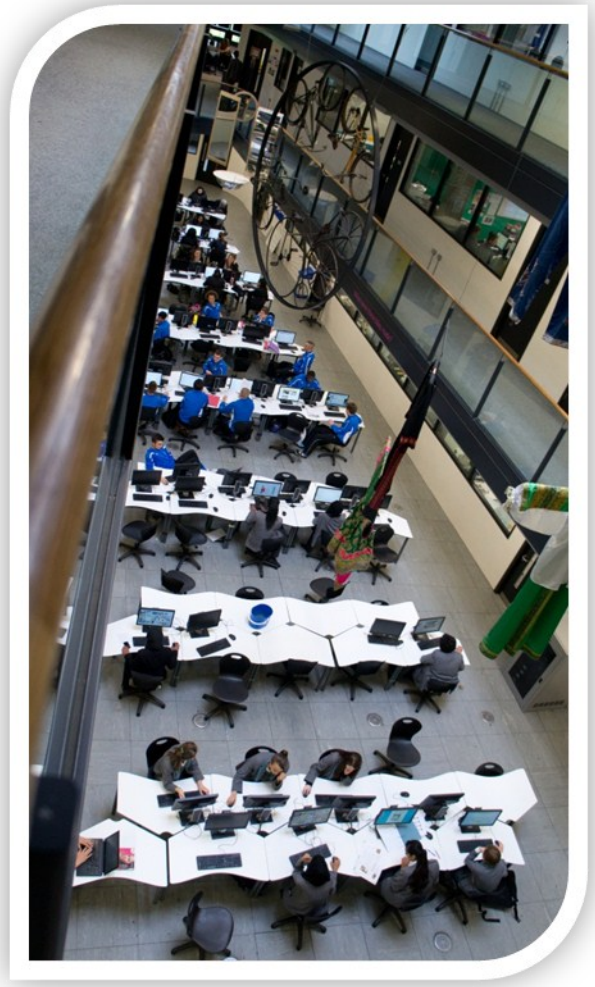**Media studies lab with Apple Mac's**



**Library**



**Computer labs**



**Computer labs**

**Albany Senior High School—New Zealand**

Public High School established in 2009, co-ed, Years 11 – 13 and number of students 750. NZ European/Pākehā 60%, Māori 6%, Asian 15%, Pacific 2%, Other European 8%, Other 9%.

The curriculum available to students: (*Extract from the school website*)

**The subject environment at Albany Senior High School**

The building has a similar construction to Langley Academy although classroom spaces are more open with computers available in all spaces. Glass is used to make the space "transparent" and students are able to see the construction of the building. The point of difference between Langley and Albany is that Langley still has separate classroom spaces, whereas Albany has open work spaces where up to 3 or 4 classes can utilise the space at the same time.

Albany has a good network system and a wireless network is available to all students. Students are allowed to use their own devices at school and this was evident in the Media studies class I visited on the day. All students were using their own device and not the Apple Mac available to them. There are approximately 250 desktops. There is one computer lab with approximately 30 computers available used specifically for Digital Information Technology and approximately 30 Apple Mac used for Media Studies. The remaining desktops are scattered around the various open learning spaces.

One way of avoiding subject overlap at Albany is students are only allowed to select one product design course; however they are able to mix material from different areas depending on their project.

| Learning Area: | Level 1: | Level 2: | Level 3: |
|---|---|---|---|
| **English** | | | |
| English<br>English for Academic Purposes | 1ENG;  1EAP | 2ENG;  2EAP<br>2EAP/13 | 3ENG |
| **The Arts** | | | |
| Performing Arts | 1DAN; 1DRA;1MUS | 2DAN; 2DRA; 2MUS | 3DAN; 3DRA; 3MUS |
| Visual Arts | 1VAR | 2DES; 2PAI; 2PHO | 3DES; 3PAI; 3PHO |
| Art History | | 2ARH | 3ARH |
| **Health and Physical Education** | | | |
| Health | 1HEA; 1PED |  2HEA; 2OUT; 2PED | 3HEA; 3OUT; 3PED |
| **Learning Languages** | | | |
| Languages | 1JAP;  1SPA | 2JAP; 2SPA; 2REO | 3JAP;  3SPA |

| Mathematics and statistics | | | |
|---|---|---|---|
| Mathematics and statistics | 1MAT;  1MAS | 2MAS;  2MAC | 3MAS;  3MAC |
| **Science** | | | |
| Science | 1SCI | 2BIO; 2CHE; 2PHY | 3BIO; 3CHE; 3PHY |
| **Social sciences** | | | |
| Business | 1ACC; 1BUS; | 2ACC; 2BUS; 2ECO | 3ACC; 3BUS; 3ECO |
| Classical Studies | | 2CLA | 3CLA |
| Geography | 1GEO | 2GEO | 3GEO |
| Media Studies | 1MED | 2MED | 3MED |
| History | 1HIS | 2HIS | 3HIS |
| Travel and Tourism | | 2TRA | 3TRA |
| **Product Design** | | | |
| Product Design | 1DIG; 1FOD; 1DVC;  1HAR; 1SOF | 2AUT; 2CRE; 2DIG; 2FOD; 2DVC; 2HAR 2SOF | 3PRD (Includes all technology disciplines) 3CRE |

The software or web facilities commonly used in the school are mahara / e-portfolio and wikieducator.

- Digital Information Technology: Use PC's and students are exposed to open source software such as game design tools using java programming for minecraft, unity 3d engine, C# (also used for app design), Scratch, App inventor and weebly web design and hosting is used across courses and impact projects too.
- Design and Visual Communication: Offered – mainly traditional facilitation
- Photography and Visual Art: GIMP, Inkscape and Scribus are used.  Blender (3d graphics tool) are used extensively by students in various impact projects.
- Media Studies: Use apple computers and the adobe suite
- Visual Art:  Offered using the traditional format, not using digital format yet.
- Technology – Engineering/Wood/Auto: Have great facilities, however looking at adding technology as an aspect of the subject. Computer lab with Auto cad and other software related to Woodwork and Automotive.
- Electronics: Not offered

Google docs are used in many of the subjects but particularly in English for giving feedback and tracking student work. The teachers/staff use Google docs to collaborate and share.

Staff and students use prezi software increasingly to present their lessons and ideas.

Albany Senior makes use of open source software and this means that students have access to the software at no cost.  Students are therefore able to experiment and improve their skills at home and in doing so become powerful users of the software.
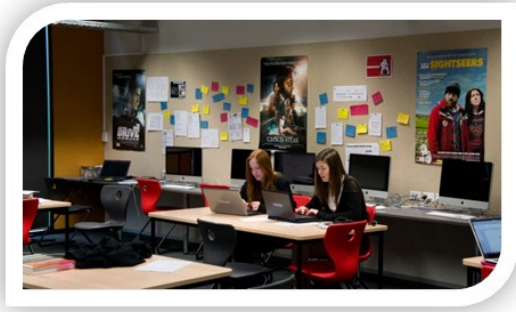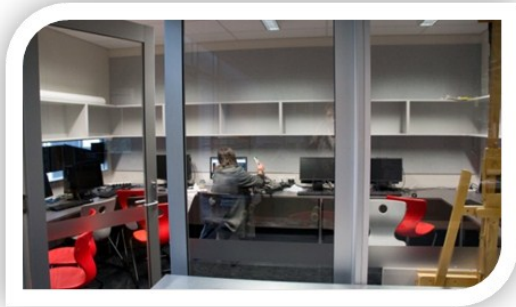
**Media Studies space**



**Green room used by media studies students**



**Art room computer space**
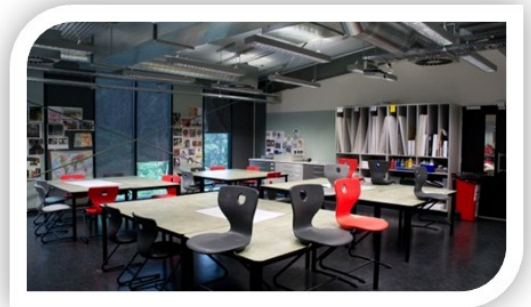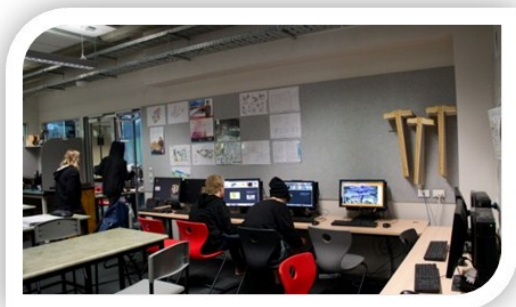


**Art space**
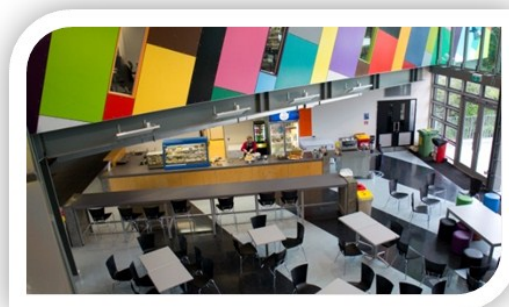


**Library space**



**General space**



**Woodwork space**



**Outdoor space**



**Lunch space**

## Implications

It became apparent as I visited the various schools overseas that the curriculum is much more limiting to students.  Consequently schools were not finding that they have subject overlap or that there was much overlap of the software used in subjects.  At Albany Senior where this did occur, it was felt that since the subjects concentrated on various aspects of a specific software and that overall, students would have a more rounded knowledge of a particular software.  They felt that by not limiting students to using a certain software, students are able to use the software they feel most comfortable with in producing their projects and work. Most technology subjects are offered as a one year course in overseas schools visited. Microsoft and Adobe are used mostly by all schools although Albany Senior has embraced the open source software model.

The physical environments varied depending on when the school was built.  Most schools environments for the various subjects were fairly consistent and traditional in layout.  Langley Academy and Albany Senior High were the only two schools whose learning environments are currently bringing digital technology into the 21st Century. At Langley Academy teaching spaces are semi traditional, however the point of difference is that these spaces are glass which means that anyone can observe what is going on in the teaching space.  At Albany Senior the teaching spaces are open plan, with some traditional specialist areas eg Woodwork, photography, Art, Fabric, Media Studies etc.

## Conclusions

It is exciting to realise that Long Bay College built in the 1970's is providing facilities which bring the use of digital technology in subjects into the 21st Century.  I am very proud of what is happening at Long Bay College as the BOT and the senior management continue to look at ways to enhance the facilities so that students are proud and feel that the school is a place that inspires and where students want to be.  The proposed new Art Block will provide students with the latest digital facilities. The wireless network at Long Bay College has made it possible for students to use their own devices and giving students access to the internet.   It was also pleasing to note that software is used extensively at Long Bay College compared with the overseas schools visited.  Something to consider is possibly introducing open source software so that students have easy access.  Long Bay College has introduced the use of Google docs and students and staff are embracing this collaborative approach to teaching.  Staff are also making use of Moodle, our Student Management system and Facebook, to engage with students.

Visiting the various schools has given me inspiration and vision not only in the technology area, but also regarding the learning spaces of other subjects, including the recreational area.

Finally I would like to tank TeachNZ for my selection and opportunity to experience the learning environment at schools overseas.  It has been rewarding and the rest has been uplifting.

## References

Edison High School, Retrieved 2013, July, 10 from http://edisonchargers.com/
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