GUERNSEY INTEGRATED
LEARNING ENVIRONMENT

20^{20} Vision

Learning Through Technology

Version 1.0

EDUCATION
A STATES OF GUERNSEY GOVERNMENT DEPARTMENT

"The future is already here – it's just not very evenly distributed." – William Gibson

Introduction

The purpose of this document is to provide a vision for the role of technology in delivering the Education Board's vision for education. Whilst it does not address implementation issues but instead investigates what the vision might look like, it is expected that GILE will form an important part of its delivery.

Assuming that the features of learning in 2020 will be:

- Every student working at his or her own pace;
- Students working in groups and helping each other;
- Teachers working increasingly one-on-one with students;
- Learning no longer confined to school and school hours;

Click image to view

http://goo.gl/omnnYb

Background

Our world is changing. It's becoming smaller, faster, more connected and more competitive. We can now instantly communicate with anyone, anywhere and access all human knowledge with a device that fits in the palm of our hand and nearly everyone on the planet can do the same thing. Our children will truly compete with their peers across the globe.

In the past 5 years the 'digital universe' has grown by 1000%

Technology allows for the design of a continuous progress system where learners move at their own pace, addressing skills and topics as soon as each learner is ready. Learning activities can be tailored to meet unique needs and engage students in authentic experiences.

Access to powerful anytime, anywhere learning devices will help students customise their own learning and provide instant access to unlimited content; students will also connect to others anywhere in the world, creating learning networks where they can collaborate with other learners, mentors and experts outside the classroom.

A great learning experience will continue to place students alongside inspiring, well trained professional teachers. Technology will allow teachers much more time to work individually with students, providing for more personalised interactions.

In the knowledge-based society of today the sheer volume of accessible information is greater than ever before and is increasing at an incredible rate. There are 2,000 new websites created every hour and 35 hours of video are uploaded every minute.

The structure of this knowledge-based society is built around individuals with the ability to search for and use information and continuously adapt to a rapidly changing globe. If the Bailiwick is to remain competitive, it must have an education system that ensures everyone, regardless of socio-economic background, is able to participate in such an increasingly demanding, knowledge-based society.

Delivering a Vision of Education for the 21st Century

The Education Board's vision is rooted in personalised learning. It focuses on providing students with the skills they need to participate in a knowledge-based society, while also allowing them to explore an educational path that is best suited to their interests, their capabilities and their chosen future. Such a vision will mean that the system may well need to be transformed in a number of ways.

Google handles a billion queries every single day

(or about 115,740 in the time it took to read this fact).

From Learning Information to Learning to Learn: The education system should place greater emphasis on the learning of skills over the learning of content. The content relevant to a student's interests is constantly changing and growing so students will have to continue learning new things throughout their life. Instruction should more consistently focus on the skills required to find and use relevant content rather than on the delivery of pre-determined content.

From Data to Discovery: Content will have to evolve constantly, not only to remain relevant but so students are ready to deal with how rapidly information changes in a knowledge-based society. Students must play a greater role in discovering their own content so the measurement of success will be related to how they find, use, and develop accurate, relevant content.

From One Size Fits All to Tailored Learning: As students progress they will increasingly access and engage with their own content, at their own pace of learning and take an increasing role in charting a path best suited to those talents, interests and abilities. On a day to day basis this will require a more project-based or problem-based approach and will help to keep the students engaged and interested in learning.

From Testing to Assess to Assessing to Learn: Technology allows teachers and learners to assess progress more regularly than with traditional classroom assessments and to identify and address each learner's challenges as they arise. This is in contrast to tests and exams that measure what a student learned at the end of an instructional unit by which time it is often too late to address shortcomings.

From Classroom Learning to Lifelong Learning: Lifelong learning can be encouraged by incorporating aspects of a student's life outside of school into their education. The education system must evolve from being the focal point of education to more of a base camp for learning. Students only spend a fraction of their time in schools and there is also a need to continue learning throughout life beyond the period of formal education and the boundaries of the school. This requires a more balanced approach that includes learning partners and increased engagement of parents and the community.

How can the new technologies benefit teaching and learning?

Harnessing the power of technology to enhance learning and teaching will ensure that:

- Students are able to take greater control of their own learning by using technology to personalize their learning experiences, explore their own directions, and use tools that match their learning styles.
- Schools can connect with parents in their homes and workplaces, and reach out to the global community in ways never before imagined.
- Students have the access and opportunity to use technology as an integral part of their learning environment and to have engaging and empowering learning experiences both in and outside of school.
- Teachers understand the profound impact that contemporary technologies have on how students learn, and are able to teach in face-to-face, online, and other non-traditional environments.
- Students are engaged through the use of technologies that form both a part of their experiences and the world around them.

Key Trends

The NMC Horizon Report lists the following key trends which should inform any vision for technology and education:

1. Education styles are shifting to include online learning, hybrid learning and collaborative models;
2. The abundance of resources and relationships made easily accessible via the Internet is increasingly challenging us to revisit our roles as educators;
3. As the cost of technology drops and schools revise and open up their access policies, it is becoming increasingly common for students to bring their own mobile devices;
4. People expect to be able to work, learn and study wherever and whenever they want;
5. Technology continues to profoundly affect the way we work, collaborate, communicate and succeed; and
6. There is a new emphasis in the classroom on more challenge-based, active learning.

Many of the top jobs in 2012 didn't exist in 2002:

- Social media strategist
- User experience specialist
- Telework manager
- Sustainability manager

Challenges

The importance of digital literacy as a key skill in the workplace continues its rise in every discipline and profession, not least within education. Any curriculum that does not take account of the need to develop these skills in an increasingly technological world, is limiting outcomes for pupils.

The challenge of developing digital literacy is made difficult by the fact that it is more about thinking and less about tools. Any system put into place to develop these skills, that is based purely on tools and platforms, will fall short.

There are several challenges listed here that are faced by educationalist world-wide and should inform the development and use of new technologies in our schools.

Blending of formal and informal teaching

The traditional teacher led lessons followed by tasks to test the pupils' understanding form the majority of the learning experiences of pupils in our schools. If pupils are to be provided with a rounded education with the inclusion of 'real world' experiences then they must experience more informal lessons and also start to learn outside the classroom/school environment.

'Flipped Learning', an innovative learning model, is beginning to address this issue by encouraging pupils to extend their learning in different directions. The basis of this approach is to use materials such as online videos to enable pupils to learn new concepts and material outside of school. Using a system such as a Virtual Learning Environment (VLE) or discussion forum, the pupils can discuss their level of understanding or problems with the material prior to the lesson. This in turn provides time within class for working collaboratively with classmates, discussions, problem solving and support from the teacher.

Personalised learning

There is an increasing demand that education should be customised to the needs of each student. This is starting to drive new developments, but there still remains a gap between what is perceived as being necessary and what is available. A 'one-size-fits-all' system is no longer the most effective method of dealing with the diverse needs of pupils. In the future it will be necessary to provide a system that enables pupils to make decisions about the tools, content and methods of learning that are appropriate to them as individuals.

Learning that incorporates real life experiences

The 'digital world' that pupils inhabit can all too often end at the school gate. This is a challenge to schools as it can impact on the engagement of pupils and often leads to them questioning the relevance of their learning. In short, schools are preparing pupils for this new world, but are only using a sub-set of the features of this digital world.

One current idea that is looking to engage with the 'real world' forms the basis of what are becoming known as Studio Schools.

Learning outside the school environment

As individuals we are constantly involved in learning at a level that far outstrips that experienced by any previous generation. As recently as the early 1990's a computer programmer who needed guidance on new developments had to visit a library or bookshop to access limited and often outdated information. Now the same programmer can search for the latest information online in a matter of seconds, discuss ideas with colleagues anywhere in the world and can be updated on new ideas via their Twitter feed.

Pupils now learn in their spare time, through a range of online materials. Be it through games and programs they have on their home system or their extensive, and constantly available, social networks. The challenge for schools is to link this back to the classroom; as such learning often happens in a serendipitous way in response to an immediate need.

Needs of the Knowledge-Based Society

The traditional skills such as literacy and numeracy, skills that have been the bedrock of the education system for more than 100 years, are still vital but need to be applied in different ways and combined with new skills and attributes if learners are to become full participants in a knowledge-based society.

> Many of the jobs that students will have don't even exist yet, and they'll use technologies that haven't been invented, to find solutions for problems that haven't emerged.

Critical Thinking and Problem Solving: Learners need the search skills required to access information, the critical thinking skills needed to analyse and evaluate that information, and the problem solving skills required to effectively use that information. It involves purposeful, reflective judgment, logical analysis, and assessment of factual accuracy, credibility, significance and fairness.

Creativity and Innovation: Creativity and innovation allow one to generate ideas and concepts, to see information in a different way from others, and to approach issues from a different direction.

Technological Literacy: Technology literacy is the ability to use technology to amplify one's learning ability, and improve one's productivity. It means the ability to use technology rather than the ability to construct or maintain technology.

Communications and Media Literacy: Communication is the ability to relate concepts and ideas to others either in person, on the page or through technology. Media literacy includes the ability to interpret and use media to access, assess and analyse information and the ability to use new media forms to communicate information.

Collaboration and Teamwork: The interactive nature of a knowledge-based society places the focus on the ability to collaborate. Innovation requires multiple people interacting in different ways and this increasingly takes place through interactive technologies.

Monday 23rd March 2020

The following pages provide an illustration of the experiences of pupils, teachers and parents on a single day in 2020:

Sophie (Year 2)

Today Sophie is going for a walk through the Amazon Rainforest.

Sophie is 7 years old and today she and her class are going for a walk through the rainforests of Brazil. Along the way she will be able to find out information about the creatures and plants that she sees. She and her group have already been looking through a guide book about their trip that has been created by their teacher on her tablet computer. She will record her experiences using the voice recognition on her iPad and also capture photos and videos of the trip.

Later she will create her own guide book, incorporating words, pictures, videos and sounds. The book will be produced as an eBook which she will be able to show to her Mum on their iPad when she gets home.

Chloe (Year 6)

Chloe is 10 years old and is halfway through her time in Year 6. She arrived at school this morning with her tablet device in her bag. She's been bringing this to school ever since she moved up to the Junior Department. The first thing she does is to make sure that it has automatically connected to the school system.

Alongside her tablet she also has her smartphone which she tends to use for recording video and audio and sometimes for quick searches on the Internet. It is also really useful for keeping track of the various Twitter feeds that she follows. A few years ago she would have had to hand it in to the school secretary at the start of the day, but since then the children have been able to bring any suitable device as long as they use them responsibly. Her teacher regularly reminds the children in her class as to how to stay safe online. Some children who don't have a device with them (not many these days) are visiting the secretary to book out one of the school Chromebooks to use for the day.

While her teacher is taking the register using her own iPad, Chloe watches the video she made last week of her teacher explaining equivalent fractions; she used this over the weekend to help her create her own animation to help her friend Abasi. He has always struggled with fractions so Chloe sent him an email with a link to the file in her online storage space.

Chloe is a bit of a maths expert, in fact she loves it! Most evening for the last few months she has been working her way through the various topics provided by the Khan Academy and has already started working on some of the areas that she will be covering next year at High School. When she gets stuck and needs some help, she is able to contact the teacher who will be teaching her mathematics at her new school.

Some of the other children are reading the class book for this term and are making notes and highlights which the rest of their reading group can view. Later today the teacher will display these on one of the large plasma screens that have replaced the SmartBoard they used in the Infant Department. In fact anyone in the class can display their work or ideas on these screens.

Chloe is really looking forward to the webinar that some of the pupils from her new school are going to be giving on their project to market and then sell fairtrade coffee. As well as checking on their Twitter feed and their Facebook page, she has already been able to video message them to ask a few questions. She is particularly excited because as well as the presentation being given by her brother, the school also uses coffee beans grown by some of the parents of the children from Abasi's school in Kenya. Later in the week the class will be working in groups to produce a marketing campaign to help sell the coffee.

This afternoon the class will be getting their hands on Roman artefacts. Not real ones, they are too fragile and valuable, but real life sized reproductions that their teacher has created using the brand new 3D printer that the school has just taken delivery of. She has already been researching the background information using the information left on the VLE for her by her teacher. In fact she has already posted several questions that she would like to ask.

...her class will experience the sights and sounds of The Blitz.

At the end of the week her class will be going into the 'Igloo' to experience the sights and sounds of World War II London. This will be the starting point for the class to produce their own documentary about The Blitz using the school's 'Green Screen' studio.

Michael (Year 10)

Michael is in Year 10 and is 15 years old. Just like Chloe he brings several of his own devices to school each day and since the school stopped buying textbooks and replaced them with eBooks there is not much else in his bag. The old school lockers are now a thing of the past as are most of the printers and desktop computers in the school.

'The 21st Century just doesn't fit into neat rows!'

In fact quite a lot has changed since he moved here from his primary school. The classrooms look completely different now. The tables are grouped together into what the teachers call 'Learning Stations'. It's been this way ever since the students were allowed to bring their own technology to school. One of his teachers told him once that since the school were making sure that they all developed the new skills they will need it has to be this way because, 'The 21st Century just doesn't fit into neat rows!'

After lunch, Michael and some of his year group will be giving an online presentation to children at their local primary school. For most of this year they have been working on an extended project (part of 'real-life learning') to produce Fairtrade coffee for sale in local shops. This has involved working collaboratively, both with each other and contacts in Kenya. The group worked on the presentation using an online collaboration tool called Evernote. The project has thrown up a whole host of problems that have had to be overcome by the students themselves and any profit they make will be returned to the farmers in Kenya.

Being one of the IT experts within the school, he is part of a group of pupils (eKIDS) who provide technical support, both to other students and members of staff.

The highlight of Michael's day however is at last getting his hands on a set of the latest Google Glass! The school are part of a pilot to evaluate how these could be used in school. Michael is very excited by the possibilities.

Susan (Year 13)

For Susan, an 18 years old Post-16 student, technology is completely embedded within her experience of learning. Just like the younger learners, she brings her own technology with her. In fact she would now find it very hard to return to the way of working of just a few years ago. She no longer thinks of learning being something she just does at school, it is now part of her day-to-day experience.

Her first session this morning is chemistry. She spent time on the weekend setting up an experiment using the 'Remote Lab' that she has been given access to. These are not the 'simulations' or online 'virtual labs' they used in her previous school. Rather, they allow her to control real lab equipment that is thousands of miles away. Today she is going to run the experiment again but this time with a few slight adjustments. Next term she and her fellow learners will be using this same 'remote lab' to carry out an experiment using radioactive material.

Susan also has a real interest in Computer Science and has recently signed up for an online course on artificial intelligence at Stanford University. This is one of several MOOCs (Massive Online Open Courses) that she has studied, mostly in her own time but also as part of her learning at school. Susan, like the rest of her classmates, has been developing her own 'Personal Learning Network' (PLN), a collection of tools that she uses daily as part of her learning.

Mrs Tracy Smart (Parent)

Tracy is the 40 year old parent of Sophie, Chloe and Michael. Being of the 'Millennial Generation' she was brought up at a time when digital technology became an increasing part of everyday life, and as such fully supports the school's use of technology.

She no longer expects to receive paper based end of year reports, instead she is very happy with the continuous feed of information about her children's development that is provided to her online by the school. She no longer feels the need to attend Parents' Evenings as she can contact her children's teachers at any time.

She no longer expects to receive paper based end of year reports...

Miss Jane Mahy (Teacher)

Jane is 28 and the High School Science teacher, though since 'Flipped Learning' is now very much a part of the teaching and learning at the school, there are suggestions that her title should be changed to 'Lead Learner'.

The recent introduction of 'Learning Analytics' at the school has complemented the 'flipped' approach and allows for a significantly greater level of personal or differentiated learning; making data an integral part of planning, designing and assessing the learning experience.

She makes use of both the resources that are shared by her colleagues locally via 'The Harbour' and the enormous amount of 'Open Content' available from teachers all over the world. She makes courses available online using the iTunes U Course Manager and downloads free books from sites such as Wikibooks. These can all be provided electronically. It's been quite a time since she last had to print something on paper.

She does however use the 3D Printer. Most recently to create a set of scaled down dinosaur bones for one of her lessons.

Gone are the days when she used to carry home a mound of marking since all work produced by the pupils is now submitted online. She is able to give feedback almost as soon as the work is uploaded.

It is not only the pupils who make use of technology for their learning. The staff also have access to an almost unlimited number of online courses (MOOCs) and are able to study alongside other teachers from all over the world, all be it in a virtual environment.

Jane has a high level of technical skills but even she sometimes uses students such as Michael to help her get to grips with a new piece of technology.

She is happy that her workload has been reduced by the introduction of the online assessment and recording system and that she no longer needs to write the end of year school reports due to the fact that this information is continuously available to parents via the online system.

At tomorrow's staff meeting she is going to be discussing with her colleagues the possibility of changing the school hours, of recognising that the time pupils spend working away from school should count towards the hours they are expected to attend school.

Summary

The features of learning in 2020 will be:

- Every student working at his or her own pace;
- Students working in groups and helping each other;
- Teachers working increasingly one-on-one with students;
- Learning no longer confined to school and school hours;
- And a school day full of creative, hands-on projects that give learners practical knowledge and experience.

This will be achieved by:

- Providing access to powerful anytime, anywhere learning devices which will both blur the distinction between in and out of school and will lead to the re-evaluation of the role of the teacher.
- Technology which will allow teachers much more time to work individually with students, providing for more personalised interactions.
- Ensuring that students are able to take greater control of their own learning by using technology to personalize their learning experiences, explore their own directions, and use tools that match their learning styles.
- Schools connecting with parents in their homes and workplaces, and reaching out to the global community in ways never before imagined.

20^{20} Vision

Learning Through Technology

Version 1.0