Curriculum and Leadership

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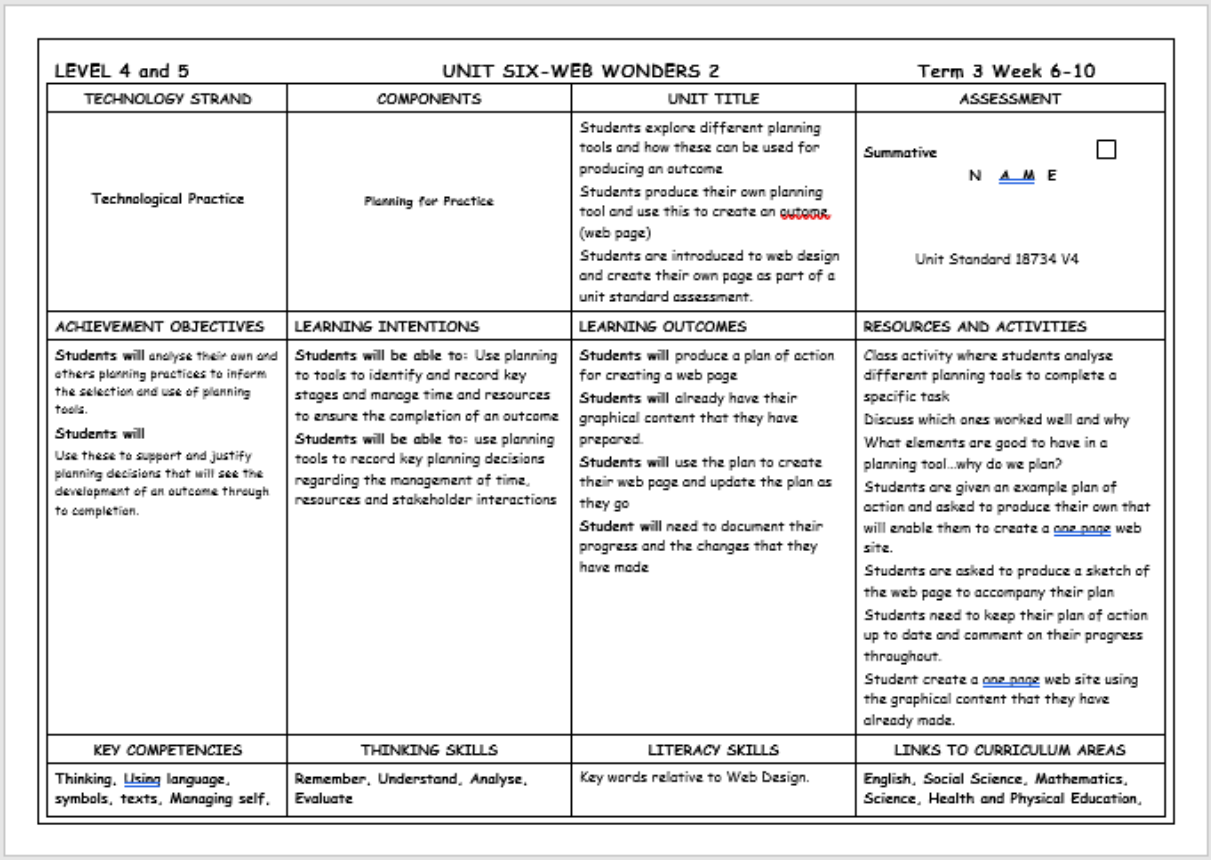
Rationale



LEVEL 4 and 5	UNIT SIX-WEB WONDERS 2		Term 3 Week 6-10
TECHNOLOGY STRAND	COMPONENTS	UNIT TITLE	ASSESSMENT
Technological Practice	Planning for Practice	Students explore different planning tools and how these can be used for producing an outcome Students produce their own planning tool and use this to create an outcome (web page) Students are introduced to web design and create their own page as part of a unit standard assessment.	Summative ☐ N A M E Unit Standard 18734 V4
ACHIEVEMENT OBJECTIVES	LEARNING INTENTIONS	LEARNING OUTCOMES	RESOURCES AND ACTIVITIES
Students will analyse their own and others planning practices to inform the selection and use of planning tools. **Students will** Use these to support and justify planning decisions that will see the development of an outcome through to completion.	**Students will be able to:** Use planning to tools to identify and record key stages and manage time and resources to ensure the completion of an outcome **Students will be able to:** use planning tools to record key planning decisions regarding the management of time, resources and stakeholder interactions	**Students will** produce a plan of action for creating a web page **Students will** already have their graphical content that they have prepared. **Students will** use the plan to create their web page and update the plan as they go **Student will** need to document their progress and the changes that they have made	Class activity where students analyse different planning tools to complete a specific task Discuss which ones worked well and why What elements are good to have in a planning tool...why do we plan? Students are given an example plan of action and asked to produce their own that will enable them to create a one page web site. Students are asked to produce a sketch of the web page to accompany their plan Students need to keep their plan of action up to date and comment on their progress throughout. Student create a one page web site using the graphical content that they have already made.
KEY COMPETENCIES	THINKING SKILLS	LITERACY SKILLS	LINKS TO CURRICULUM AREAS
Thinking, Using language, symbols, texts, Managing self,	**Remember, Understand, Analyse, Evaluate**	Key words relative to Web Design.	**English, Social Science, Mathematics, Science, Health and Physical Education,**

Above: Current Year Ten Digital Technologies Web Development Unit (Griffiths, 2018)

Papatoetoe High School is a school with a significant digital technologies curriculum, and a large number of courses that cover a diverse range of topics.

The subject area is split into the disciplines of general, multimedia, programming, and web development. In 2018, there were a combination of year nine and ten classes, along with one NCEA level one general digital technologies class, one NCEA level one programming class, one NCEA level two programming class, one NCEA level two multimedia class, one NCEA level two web development class, one NCEA level three multimedia class, and one NCEA level three programming class.

Junior level classes are offered as “tasters” for senior level classes, and learners are encouraged to sample parts of each discipline as part of each junior level course. Multimedia is covered through learning Adobe Illustrator and Photoshop skills. Programming is showcased through the use of Scratch and robotics experiments. Website development is demonstrated by learning how to create websites using drag-and-drop editors such as wix.com, Google Sites, or Adobe Dreamweaver.

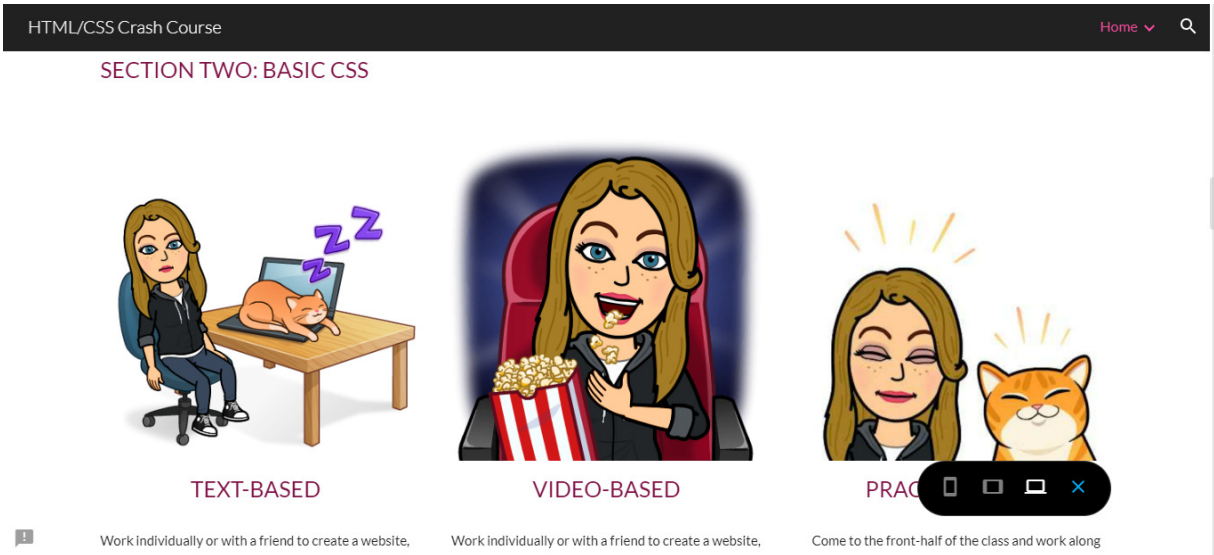
Throughout these examples, there is a natural progression of skills from the junior level classes to the senior level classes, and learners able to utilise their prior knowledge to inform their digital technologies journeys in later courses. This is not exactly the case with the website development portion of junior courses.

At the senior level, learners are expected to progress directly to using markup languages such as HTML and style sheet languages such as CSS. This means that there is very little connection between website creation in junior classes and website creation at a senior level.

The absence of HTML and CSS skill development in junior levels mean that learners are not exposed to any form of text-based “code” (the term “code” is used here loosely as HTML is formally known as a markup language) until they begin their NCEA studies.

Solution

HTML/CSS Unit Roll-Out



Above: A screenshot of the hyperdoc that I propose to roll-out to other digital technologies teachers at Papatoetoe High School (“Choose your own Website Adventure!”, 2018)

My solution to the lack of text-based markup language exposure in junior level general digital technologies classes at Papatoetoe High School is the roll-out of an HTML and CSS focused unit of work. This unit will be composed of a “hyperdoc” (central hub that contains links to activities and points of research, as well as formative assessment tasks) that is differentiated based on learning preferences, as well as comfort-level with existing content, and responsive to student needs.

This unit was developed as a part of my MTEL 8004 studies and has been very well-received by learners in my own classroom. As part of my curriculum leadership journey, I will support other teachers in the digital technologies learning area to implement the unit in their own classrooms.

Key Research

A major component of this solution is the emphasis on differentiation. Learning paths are individual to each student, and as such, they are able to maximise their potential.

According to research, the major parts of differentiating for student success are learner readiness, learner interest, and learning profile (Tomlinson et al., 2003).

My solution addresses learner readiness by providing a number of activities that can be undertaken at the learner’s pace. Videos provide the ability for learners to repeat, slow down, and access content at any time, meaning that learners are able to work at a pace that best suits them. Learner readiness is also taken into account through the variety of “Extended HTML” tasks. Topics are separated into category according to their level of complexity, and learners are encouraged to challenge themselves, but also to select tasks that best fit their skill level.

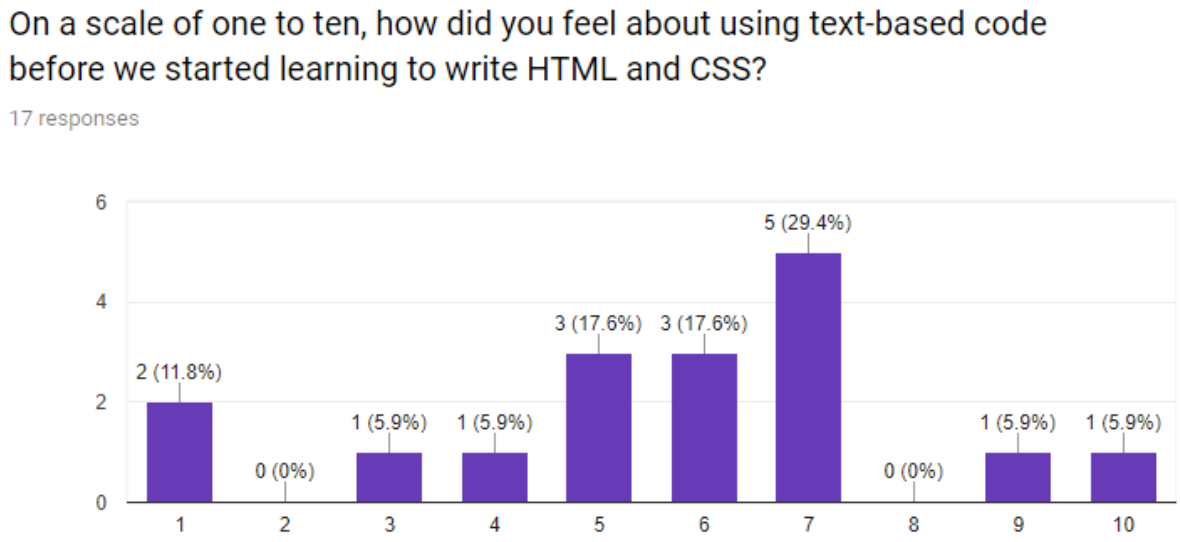
Learner interest is addressed throughout the solution as the majority of practice exercises are aimed at learning specific concepts which are then applied to the website that the student is developing. As a result of this, a number of learners in my pilot class who identify as Māori or Pasifika have created websites with a focus on their identities, which aligns itself well with both turu one of Tapasā (awareness of identities, language, and cultures of Pacific learners) and the fourth principle of Ka Hikitia (identity, language and culture count) (Ministry of Education, 2018; Ministry of Education, 2013). Website topics are chosen based on student interests, and it has resulted in a large variety of content in my pilot class. The “Extended HTML” section also addresses learner interest by providing them with a number of optional tasks that they are welcome to choose based on their own interests as well. For example, in my pilot class, a student who is very interested in YouTube videos learned how to insert a YouTube video into their website.

Finally, learner profile is taken into account through the use of learning-style differentiation. Each core content section is divided into three sections: text-based, video-based, and practice-based. This means that students are able to choose what presentation format works best for them when learning new content. This is responsive to the different pedagogical approaches that my

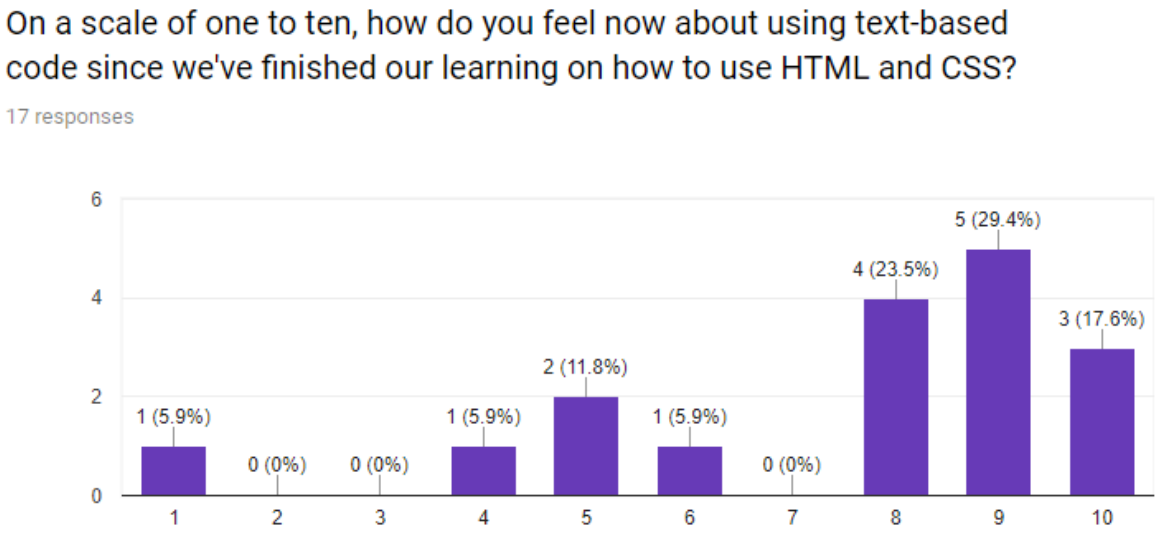
learners respond to as well, and clearly demonstrates turu three of Tapasā which talks about ensuring that pedagogies for Pasifika learners are effective (Ministry of Education, 2018). As part of the solution, I intend to include all of the above mentioned presentation formats, but some teachers of the content may not be comfortable delivering the practice-based component to their classes. As a result, I intend to leave the practice activities in the solution and teachers will be able to use this section as they think it will be best benefit their class.

Another key aspect of my solution is the inclusion of ako - reciprocal learning (Ministry of Education, 2013). Collaboration is encouraged throughout the hyperdoc, and teachers should ensure that they are best utilising the prior knowledge in their classrooms. This fits in well with turu two of Tapasā which explains that teacher-student relationships and student-student relationships should be fostered when utilising the solution to ensure that a safe space is created for learners to openly share their knowledge, passions, and opinions with each other (Ministry of Education, 2018). The aim of the solution is for the learners to work together to solve problems, and the teacher should eventually become a facilitator of the classroom. Teachers who implement the solution should also ensure that they are participating in learning conversations with the students and taking on board their ideas to help improve the outcomes of all in the classroom.

Impact

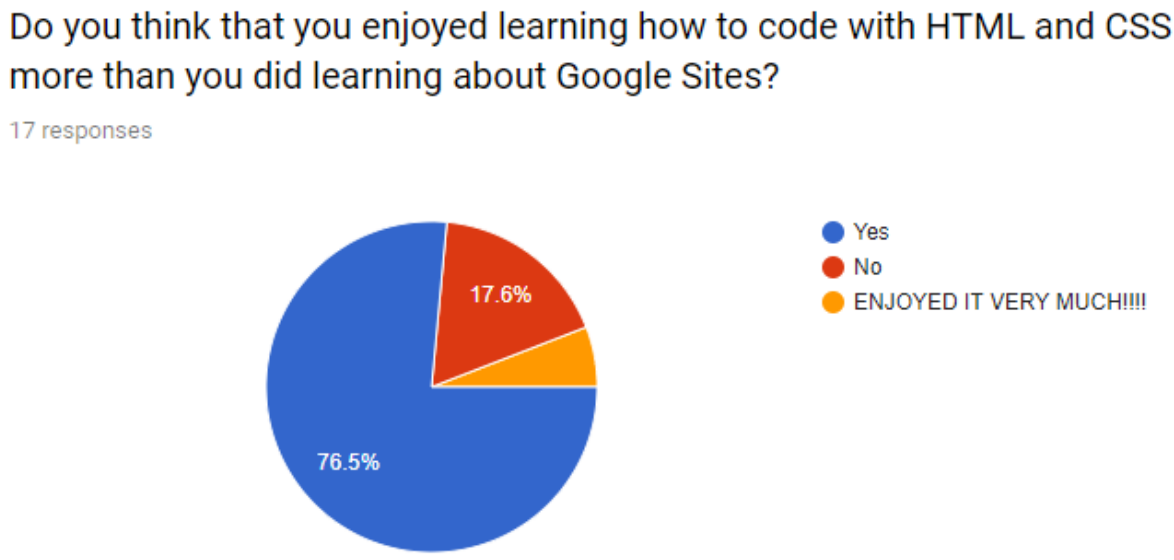


Above: Graph of student responses to the question “On a scale of one to ten, how did you feel about using text-based code before we started learning to write HTML and CSS?” (“Unit Review: HTML/CSS”, 2018)

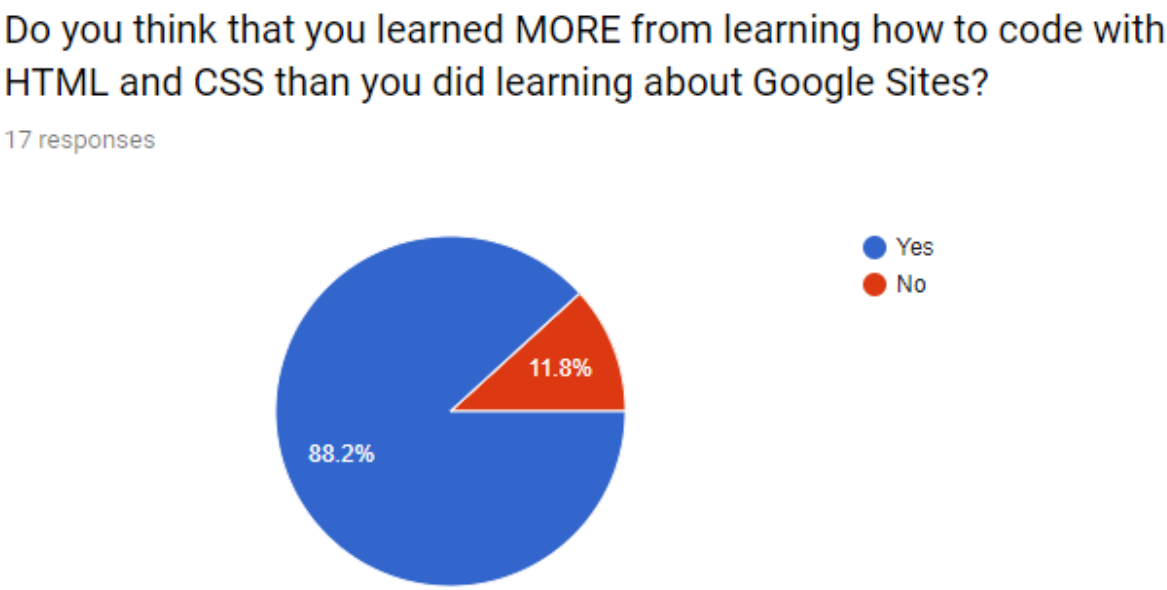


Above: Graph of student responses to the question “On a scale of one to ten, how do you feel now about using text-based code since we’ve finished our learning on to write HTML and CSS?” (“Unit Review: HTML/CSS”, 2018)

If implemented successfully, learners will be exposed to text-based “code” in a school setting earlier than they otherwise would have. This means that learners will be more familiar and comfortable with text-based computer languages by the time that they reach senior level courses that require students to work with them extensively. My research (above) confirms this based on the pilot of my own year ten class (“Unit Review: HTML/CSS”, 2018).

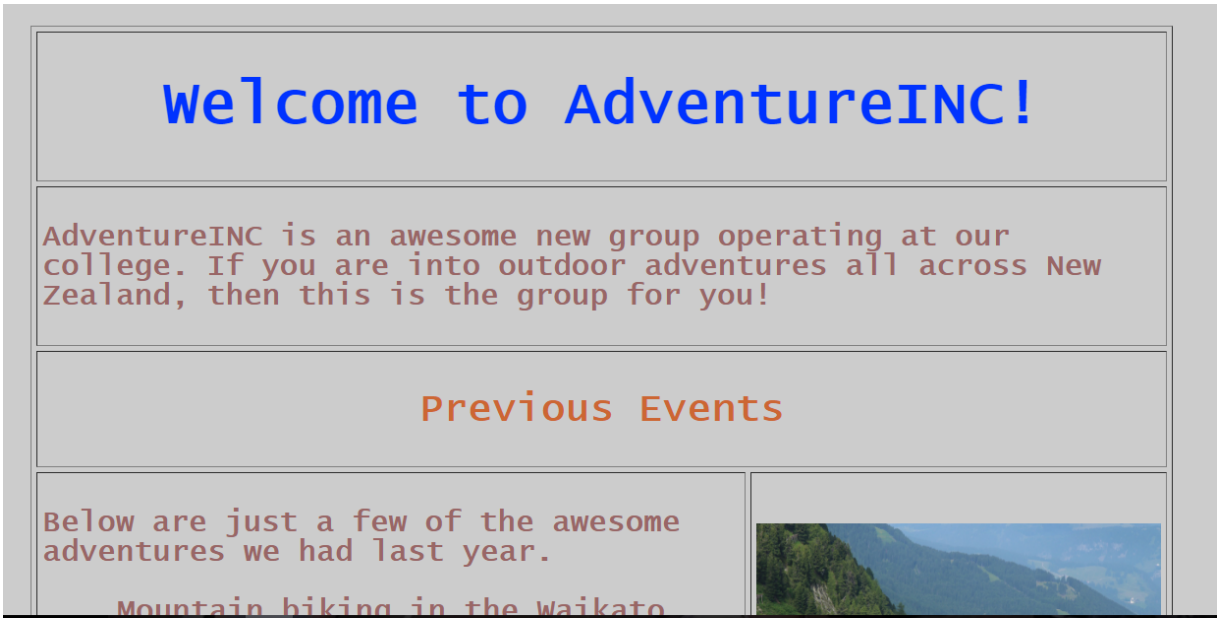


Above: Graph of student responses to the question “Do you think that you enjoyed learning how to code with HTML and CSS more than you did learning about Google Sites?” (“Unit Review: HTML/CSS”, 2018)

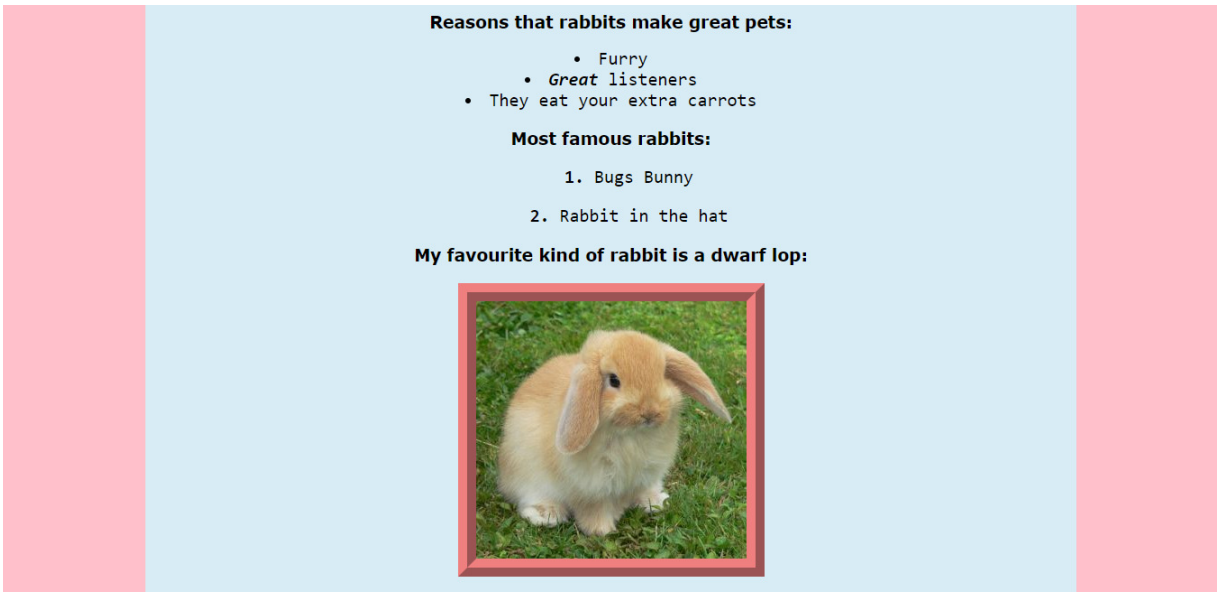


Above: Graph of student responses to the question “Do you think that you learned more from learning how to code with HTML and CSS more than you did learning about Google Sites?” (“Unit Review: HTML/CSS”, 2018)

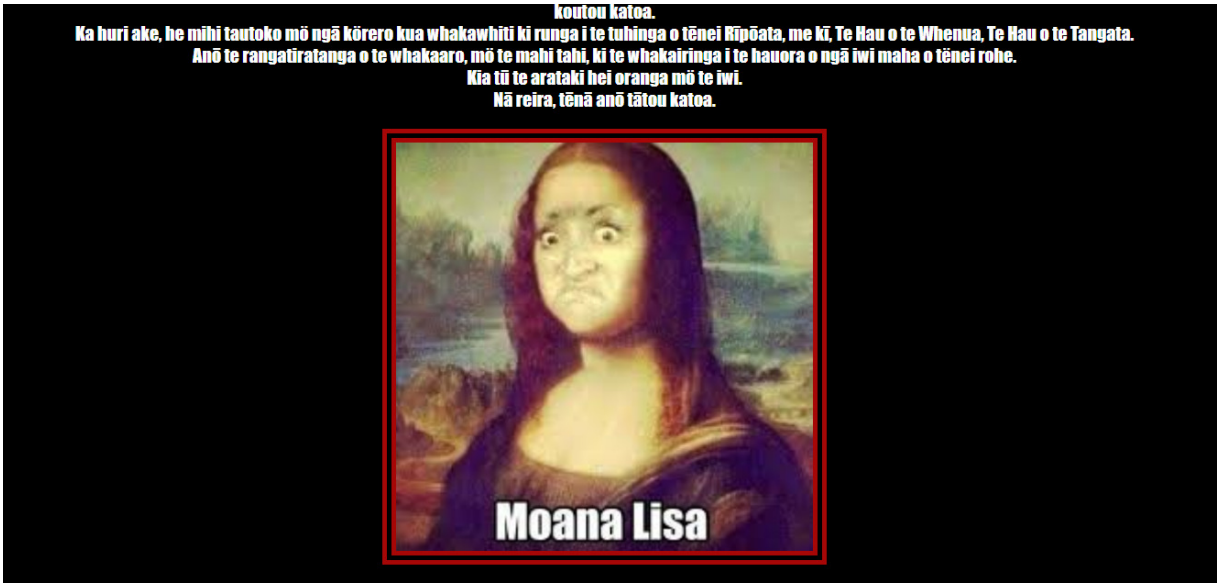
Based on my own observations, learners are also very likely to enjoy and therefore engage with the content, leading to a richer learning experience overall when compared to a drag-and-drop-tool focused learning experience. My own research based on the pilot of my own year ten class seems to confirm this (“Unit Review: HTML/CSS”, 2018).



Above: Example of outcome from 10DTG's Website Development unit in 2017 - created in Adobe Dreamweaver (Ansara, 2017)



Above: Example of outcome from my 10DTG pilot class - created with the support of my hyperdoc in 2018 (Nguyen, 2018)



Above: Example of outcome from my 10DTG pilot class - created with the support of my hyperdoc in 2018 (James, 2018)

In a more personal sense, I believe that the output of work from my year ten pilot class is of much higher quality on the whole than the work done in previous years with drag-and-drop based website editors.

Stakeholders

Year ten learners at Papatoetoe High School who take part in general digital technologies classes are the major stakeholders of this project.

Early adopters of this project will be the existing year ten general digital technologies teachers at Papatoetoe High School. They are open to trying new things, and while they have limited experience with HTML and CSS already, they are willing to learn the content in order to better support their learners. They are skilled and experienced teachers who will be able to make modifications to the unit as they see fit.

Eventually, I intend for the unit to be spread to the wider community - ideally shared to digital technologies teachers nationwide through the New Zealand Digital Technologies Teachers Aotearoa. These will be teachers who may or may not have experience with HTML and CSS, but will be receptive and open to trying new ideas.

The project also has the potential to be shared on an international scale through the use of resource-sharing platforms such as “Teachers Pay Teachers” and “TES”. I would like this to be my eventual goal for implementation, as sharing resources is something that I feel strongly about.

Point of Difference

Two currently existing solutions to the lack of text-based computer language practice at year ten level are the use of a Massive Open Online Course aimed at low level HTML and CSS, or the use of existing paper-based resources in the school.

The more complete of the two alternatives is the use of a Massive Open Online Course that already exists online. One of these courses, such as the Code Avengers or Free Code Camp courses, would be great for teaching HTML and CSS as they are already complete courses that have been used all over the world by other students already. This means that no additional resources would have to be created by the school and that any issues in the course are likely to have already been identified as the courses have already existed and been tested for quite some time.

Unfortunately, many of these solutions require payment in order to be used, and the courses have very little differentiated learning. Courses tend to be offered in only one format, with no options for consuming content based on existing learning preferences. There is also not a lot of room in these courses for differentiation based on skill level. Students will begin the course at a specified exercise and end at a specified exercise. There is no additional support for repeating similar tasks that help to solidify the same concepts, or conversely, an adequate “skipping” mechanism for students who are already fairly confident in their abilities.

Similarly, paper-based resources from previous courses within the school could be used, but there is a lack of differentiated tasks. Furthermore, the resources that exist within the school are fragmented and outdated. No complete unit (with instructions) exists, and the tasks themselves are little use without the learning resources to support them.

In this way, the best solution is to distribute my hyperdoc unit to the school as it is differentiated by learner skill level, learner interests, and learning preferences, is complete, and does not require any payment.

Implementation

Resourcing

As the majority of the implementation of the solution has already been completed, the required resources in order to make the solution more suitable to a number of different classes is minimal. Up to three hours of work will be necessary for me to complete the video-based “new” CSS lessons, and these will only require my school laptop and headset that I already own. Some aspects of the site will need to be updated, including the existing HTML formative

assessment. This assessment relies on a code that allows the teacher to access the results. As I will not necessarily be the teacher of the class that it is implemented with, I will need to source another option for formative assessment. Other small changes include the removal of the colour-based options system as part of the “Extended HTML” section and the replacement of some resources in that section as I found that a number of them were not as effective as I had hoped they would be. I propose that this will take up to five hours of work to complete these tasks.

If the project is extended nationwide or worldwide, I expect an additional three hours of time will be necessary to complete product descriptions and make any final changes to the resource to make sure that it is appropriate for an extended audience.

Category	**Time Requirement**	**Other Requirement**
Video-based CSS	3 Hours	-
Extended HTML/Other	5 Hours	-
Extension*	3 hours	-

Note: * denotes that this is an optional endeavour and does not need to be completed for the project to be successful.

Sustainability

Stakeholders should have no trouble implementing this solution for the foreseeable future. As with all technology, there is the possibility that it will need to be updated as changes occur to the standards of the HTML5 and CSS3 language. There is no need for concern in regards to new versions of HTML and CSS as the Web Hypertext Application Technology Working Group (a group that makes significant contributions to the development of the HTML language) has moved to a “living standard” model where no additional versioning will be applicable in the future (Hickson, 2011).

The solution may have limitations in terms of flexibility for the teachers who use it as a resource to support their teaching. As it is presented as a full unit, with no modifications necessary, some educators may want to make changes to the resource to better reflect their classroom or their teaching style. In order to make the resource as flexible as possible, I intend to offer an editable version of the resource to teachers so that they are able to modify it as necessary to meet their own needs.

Scalability

I intend to grow my leadership proposal beyond the early adopters by sharing it on the Digital Technology Teachers Aotearoa forum, and making it available on the teacher resource sharing websites “Teachers Pay Teachers” and “TES”. In this way, it will be available for other digital technologies teachers in New Zealand to use in their own classrooms, as well as potentially worldwide.

The resource itself can be used in any number of classrooms, with a variety of class sizes, so there are no concerns about scalability in that sense.

Key Metrics

In order to measure the success of my solution, I intend to survey both the teachers and students who utilise it.

As I previously did with my own pilot class, I intend to ask students about the following:

- Comfort level using text-based computer languages before using the resource
- Comfort level using text-based computer languages after completing the resource
- Enjoyment of using the resource compared to previous experiences learning with drag-and-drop solutions
- Amount of knowledge gained from using the resource compared to previous experiences learning with drag-and-drop solutions

I intend to ask my colleagues about the following:

- Ease of use of the resource
- Completeness of the resource
- Observed student engagement with the resource compared to without
- Changes in student success while using the resource compared to without

If my implementation is successful, I expect to the following:

- Students report:
    - Higher comfort level using text-based computer languages after using the resource than before using the resource
    - Higher enjoyment of website development text-based based units when compared to previous experience with drag-and-drop based units
    - Higher perceived knowledge gain from website development text-based based units when compared to previous experience with drag-and-drop based units
- Teachers report:
    - Positive ease of use
    - Positive completeness of the resource

- Increased student engagement overall while using the resource compared to previous general engagement levels
- Increased student success overall while using the resource compared to previous general success levels

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