

Putting the student in the library driver's seat: Implementing student co-design with existing library platforms to build blended learning outcomes

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Snapshot

This article was originally presented at the [VALA2020 Focus on the Future Conference in February 2020](#). It focuses on a school library's approach to using existing online platforms and services to scaffold learning by enabling students to directly curate content into the library's portal. The goal of this pilot project is a student co-designed and blended learning program to teach students how to: use collections and the literature, cite and reference, and introduces the peer review process. This enables the library to move from a passive role, being the source of quality curated collections, to a more strategic partner and collaborator role that is directly involved in delivering value by improved student learning outcomes.

Introduction

Mentone Girls' Grammar School is an open entry single sex independent Victorian school with 800 students from early learning through to the Victorian Certificate of Education (VCE). We also have a 120-year history of academic excellence. In 2019, the median study score was 35 and the median Australian Tertiary Admission Rank (ATAR) was 87.83 (Mentone Girls' Grammar School, 2019). In 2015, the School's Kerferd Library was specifically tasked by the School's senior management team to implement innovative strategies that:

- support the curriculum,
- support research and study skills, and
- support reading and literacy (Kerferd Library, 2019a)

These strategies, the way the library operates, and the technology we use, are all focused on delivering better learning outcomes for our students. This project explores ways a library can implement blended learning, user co-design and a differentiated learning environment. We wished to explore if and how:

- Teachers and library staff could work together more effectively to:
 - develop student research and critical thinking skills,
 - explore strategies to keep higher achieving students more engaged, and

- introduce year 8 students to the peer review process within the science curriculum.
- We could use existing online library products and services in a blended learning model to more directly engage with a specific cohort of students AND to give these students a voice.

Value, strategy and partnering

For a school library to have impact, and to deliver recognised value, it first must respond *directly* to the institution's goals and objectives. This is important as it drives the overall strategy and implementation of this pilot project. The three elements of the current Mentone Girls' Grammar School mission are: 'an education that empowers, a future facing school that succeeds, and a community that cares' (Kerferd Library, 2019a). However, in a school setting the library also needs to respond directly to recognised high impact teaching strategies. As a Victorian school this necessitates responding to the Victorian Department of Education and Training's High Impact Teaching Strategies (HITS), which fit within the Department's 'Framework for Improving

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Student Outcomes' (FISO) (Victorian Department of Education and Training, 2019, August 27). As a result, library services, technology and collections need to acknowledge and support this pedagogy. Critical to the success of this project was the library partnering with a key member of the teaching staff, in this case the Head of Year 7 who was also a science teacher.

Library IT

Like other libraries around the world, the Kerferd Library needs to respond to student needs and their expectation of a ubiquitous 24/7 learning service. Therefore, our existing online collections and service platforms (our WorldShare catalogue and LibGuides) had to play a key role. It is also worth noting that while the Kerferd Library is very much supported by the School we could not expect additional funding or resources. This brings us to the other element of this project – how to use existing library technology, platforms and online collections in new and innovate ways to deliver value. Being innovative does not always have to involve introducing new technology, products and / or services. Furthermore, to succeed the new service had to be sustainable.

Pedagogy and strategy

As a school library, we needed to ensure that our use of technology fitted within the teacher's rubric and lesson plans. This necessitated a blended learning approach. However, as Oliver and Trigwell (2005, p. 24) have stated "blended learning' is ill-defined and inconsistently used', so for clarity we adopted the following definitions from the Victorian Department of Education and Training, we have highlighted the outcomes of interest to this project.

'Based on projects and teaching practice in Victorian schools, blended learning refers to the planned implementation of a learning model that integrates **student-centred**, traditional in-class learning with other **flexible learning methodologies** using **mobile and web-based** online (especially **collaborative**) approaches in order to realise **strategic advantages** for the education system.' (Victorian Department of Education and Training, 2012).

From the outset, it is important to recognise that teacher librarians can and do implement learning pedagogy in their classrooms. However, while the teacher librarian is directly involved with her or his class, the role of the library can be somewhat remote in other teachers' classrooms. The school library responds to teacher requests for curating collections that support their needs, but the library is not necessarily directly involved in delivering learning. It is also worth noting that, while many school libraries focus on the critical role of supporting literacy and reading, it is less common for them to proactively support STEM subjects, particularly the science curriculum. As a result, the intent of this project was:

1. To make the role of the Kerferd Library more visible and meaningful within the science curriculum,
2. To experiment with a differentiated service focusing on higher achieving students.
3. To experiment with a user co-design model that would hopefully keep high achieving students engaged, and help the teacher and the library get informed qualitative feedback from the students because they were part of the design and implementation. This feedback would help further refine this project in 2020.

Literature review and project design

As with blended learning and user co-design, there are many variations on the definition of differentiated teaching and learning. For example, differentiation has been described as

'a set of systematic, increasingly intensive educational interventions that are designed to target an individual student's specific learning challenges' (Bender & Waller, 2011, p.11).

Also, central to Bender and Waller's (2011, p.16) definitions and framework is the 'emphasis on a set of increasingly intensive interventions, structured into intervention levels that are referred to as tiers'. These tiers can be aligned to Bloom's taxonomy, a hierarchical ordering of cognitive skills from a base level of knowledge (remembering) through to higher level learning skills such as: comprehension, application, analysis, synthesis and evaluation (Heick, 2020, Jan 6). Overarching all of this is Tomlinson's statement that

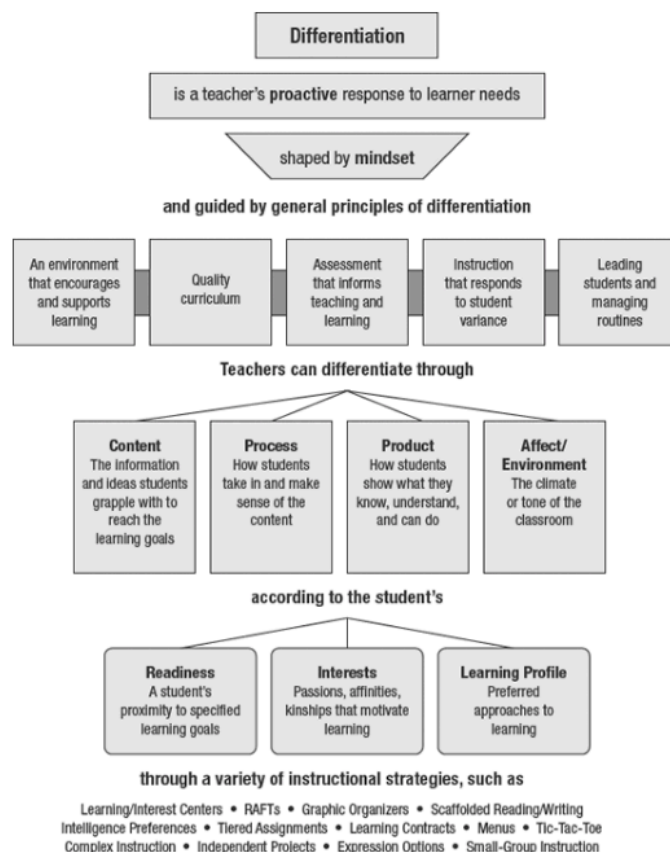
'that differentiated instruction is NOT individualized instruction... differentiation is more reminiscent of a one-room-schoolhouse than of individualization. That model of instruction recognized that the teacher needed to work sometimes with the whole class, sometimes with small groups, and sometimes with individuals.' (Tomlinson, 2017, p.3).

However, as a Victorian school, for this project we have stayed with the Victorian Department of Education and Training definition, which is:

‘A good differentiated teaching program means high quality, evidence-based instruction that meets students’ needs within their zone of proximal learning development and has clear SMART (Specific, Measurable, Achievable, Realistic and Time-based) goals.’ (Victorian Department of Education and Training, 2019)

The key element for us of this Department framework was our approach needed to be SMART, as well as fit within the target students’ ‘zone of proximal learning’. This said, we also used Tomlinson and Moon’s (2013) ‘Key Elements of Effective Differentiated Instruction concept map’ as it provided a clear process check list especially around the issues of content, process, product and environment. See the following figure for details.

SMART (Specific, Measurable, Achievable, Realistic and Time-based) goals.



This brings us to discussing what school libraries are doing to support differentiated learning and student co design, and what IT they are using to make this happen. There are schools that are actively and visibly delivering a differentiated library service, for example Scotch College (n.d.) in Western Australia. However, while there was some evidence of school libraries using differentiated instruction to support students who struggled (Ford, 2017), there appears to be very little relating to school libraries using differentiation WITH student co-design, to engage with higher achieving students. For example, searching on the ERIC education literature database

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for 'school library' AND differentiated instruction or 'school library' OR differentiated learning delivers few results and none within the last five years. Curating quality content and collections, as well as user focused service delivery, are core pillars of any good school library's service offering. Likewise, many school libraries support user education,

especially around how to research, and how to use the library services more effectively. It is less common for school libraries (possibly any library) to seek out and allow students to curate content, and for that content to then become part of the library's collection.

While there appears to be little evidence of school libraries using IT to implement differentiated learning with student co-design projects in partnership with teachers, there is research around the benefit to student learning when teachers and school librarians collaborate. For example, Subramaniam Et al. (2015, p.11) conclude that 'librarians helped students engage in the scientific information search process, ... connected science to students' real lives, and... encouraged the ethical use of information'. They go on to say that:

'with the focus on science learning shifting from the memorization of facts to learning by capitalizing on socio-cultural aspects surrounding the young people's interests and environments,... we believe that librarians have exciting opportunities to deepen science learning and that young people will benefit tremendously from the contributions of school library programs.'

Meanwhile, in New Zealand White and Watt (2010, p. 4) concluded that:

'collaboration in [their] case studies... has resulted in improved communication and understanding of expertise between teachers and librarians, and in improved learning outcomes for students'.

The literature therefore gave us the confidence to proceed.

Pilot project

Student cohort

Using Tomlinson and Moon's differentiated instruction concept map and Bloom's taxonomy we came up with the following framework. The pilot focused on a collaboration between the teacher, librarian and the higher achieving students. This was deliberate. The Kerferd Library was already doing work with the School's Learning Enhancement team to scaffold students with specific needs. Furthermore, the library had also mapped all our content back to three basic levels of differentiation (Kerferd Library, 2019b). This general and all-of-school approach enables students and teaching staff to self-select content based on their individual requirements. *See the following figure for details.*

Resource Key

When accessing content use the numbers below to guide you:

LEVEL

1

Brief, basic information laid out in an easy-to-read format. May use informal language. (Includes most news articles)

LEVEL

2

Provides additional background information and further reading. Introduces some subject-specific language.

LEVEL

3

Lengthy, detailed information. Frequently uses technical/subject-specific language. (Includes most analytical articles)

Focusing on the more advanced students in Year 8 enabled us to explore if and how this pilot project supported learning against Bloom's entire taxonomy. It also gave the teacher the option of keeping some of the more advanced students engaged in the classroom. To quote Westwood (2016) 'e-learning can be used to investigate and explore new curriculum topics, and to introduce new strategies for problem solving and higher-order comprehension.' This was important as some of the more advanced students were finishing work before the rest of the class and were getting bored and turning off as they waited for other students to catch up.

The other reason for targeting the more advanced students was the issue of sustainability. When

embarking on this pilot it was unclear how much time, effort, and student support / scaffolding would be required. Working with a smaller and more targeted cohort helped ensure this project did not detract from the teacher and librarian's other work, nor distract from the commitment to other students in the class.

Pilot design

The science teacher scoped where there were opportunities in the curriculum to introduce students to the self-directed research and the peer review process. We settled on Body Systems, which is part of the year 8 science curriculum. [The Kerferd Library had already set up a LibGuide for this topic](#) but there was still room for students to curate content. The science teacher identified students who were ready for extra challenges. This fitted into Bender and Waller's (2011, p.16) tiered levels of challenges mentioned in the literature review. The students who participated also had to commit to:

- Three to four lunch time workshops, the first workshop enabling the teacher and librarian to hand out simple instructions and explain the task. Subsequent workshops tracked progress while the last workshop focused on getting student feedback as evidence of learning.
- Being self-directed and work with a high level of autonomy.
- Use the Kerferd Body Systems LibGuide discussion board to record their research and justify how it was relevant and where it fitted into the topic. Using the existing 1,2,3 levels of differentiation outlined in the previous section of this paper, students were also encouraged to document where their recommended content would work best for the whole class and not just their own level of understanding. The following matrix outlines how this process fits within Bloom's taxonomy and Tomlinson and Moon's framework.

Task	Delivered by	Bloom's Taxonomy cognitive skills
All of class instruction	Teacher	Remember Understand
First workshop with test cohort • Provide instructions	Teacher & Librarian	Remember Understand
Student Research • Find content • Document their findings on the LibGuide discussion board • Peer review critiquing of each other's recommendations	Students	Understand Apply Analyze Create
Second workshop with test cohort • Review work • Teacher and Librarian provide additional context if required • Peer review critiquing of each other's recommendations	Teacher, Librarian & Students	Understand Apply Analyze Create
Add content into the LibGuide	Librarian	N/A
Final workshop with test cohort • Feedback and reflection	Teacher, Librarian & Students	Analyze

Bloom's Taxonomy

- 1. Remember**
- 2. Understand / comprehend**
- 3. Apply knowledge** – apply / use knowledge in a practical way.
- 4. Analyze** – use knowledge to compare / contrast and explain.
- 5. Create / synthesis** – compile learnt concepts in new ways and discover new meaning
- 6. Evaluate** – make and defend judgements based on evidence [peer review].

Source: Heick, (2020). *What Is Bloom's taxonomy? A definition for Teachers*

Tomlinson & Moon's differentiation framework

1. **Content**— *what a student needs to learn or how the student will gain access to the knowledge, ideas, and skills.*
 - a. Understanding of anatomy that goes beyond what was taught in the classroom.
 - b. Self-directed research and independence based on their own interest rather than specific teacher direction.
 - c. How to think about where their research fits into the rest of the LibGuides.
2. **Process**— *how the student will come to master and 'own' the knowledge, ideas, and skills.*
 - a. Independent research
 - b. Peer review curation process
3. **Product**— *how the student will summatively show what he has learned.*
 - a. Work curated with each student's contribution acknowledgement on the LibGuide.
 - b. How the student's research and content recommendations fit within the curriculum topic
 - c. How well the student has applied recommended levels of differentiation to their content.
4. **Affect**— *the climate that encompasses the learning and interactions among students and teacher*
 - a. Collaborative nonhierarchical workshops with students, teachers and librarians working as equals.
5. **Learning environment**— *the personal, social, and physical arrangements in the classroom.*
 - a. Workshops, individual research outside of the class room, the Kerferd Library's Body Systems LibGuide

Source: Tomlinson, C.A. & Moon, T.R., (2013) *Assessment and student success in a differentiated classroom*

Library systems infrastructure and collections

As noted above, a key focus of this project was to use existing library infrastructure and collections in more innovative ways to explore if this led to better learning outcomes. The platforms also had to be easy for the student and teacher to use. As a result, we focused on using the discussion boards that come with our LibGuides CMS platform.

[LibGuides CMS enables a library to add discussion boards](#) to individual guides and these individual discussion boards can be either private (used by teams of librarians to coordinate and administer their libraries guides) or public guides that are visible to all. As a school, we have a legal obligation to provide a safe online environment for our students, so we set up private discussion pages. While it is possible to set up discussion boards where anybody with an institution's email can self-register onto the discussion board, we went with the option whereby

the library invited specific students to sign in and access the Kerferd Library Body Systems Discussion Board. *See the following screen shot for details.*

The screenshot shows the top navigation bar of the Kerferd Library website, which is red with the school crest and name. Below this is a search bar. The main content area is titled 'Body Systems: Discussions' and includes a breadcrumb trail: 'Home / Library Guides / Year 8 / Body Systems / Discussions'. There are several tabs for different body systems: Overview, Interactive, Digestive system, Respiratory system, Circulatory system, Excretory system, Muscles & Bones, and Discussions. A 'Search Titles' box is present. Below the navigation, there are three discussion posts by users Keira Bailey, Millie Good, and another Millie Good, each with a profile picture, name, and a timestamp. The posts contain text about adding content to the library guide.

As an aside, we noted publishers such as JSTOR, EBSCO and Elsevier, as well as Australian tertiary institutions had public discussion boards but these examples are all-of-system discussion boards, they did not relate to a specific subject / topic guide. Our discussion board was set specifically for the Year 8 Body Systems LibGuides. This means that, sustainability and administration overheads to one side, we can set up individual discussion boards from each and any of our subject LibGuides.

As outlined in the pilot design, students did individual research and shared their research with the other students in the cohort. Other members of the cohort could use the LibGuide discussion board to comment and make recommendations. In the example listed below, the student has made a recommendation to include content from the library's Encyclopedia Britannica subscription. The student has outlined where their recommendation fits into the LibGuide / curriculum structure, and the student has also provided the appropriate reference (we use APA 4th edition). The student also recommends the level of differentiation and explained the thinking behind this recommendation. These are the application, analysing and creating higher level skills on Bloom's taxonomy. See the following figure for details. It is also worth noting that both the teacher and the librarian worked together in providing feedback to students. This was deliberate as we were interested in replicating the findings of White and Watt (2010).

Once the student's work was approved by the teacher, the librarian added the content into the LibGuide. This included aligning the student's content within our 1, 2, 3 differentiation codes and was based on the student recommendations and the peer input. A unique icon was added to make the student's contribution stand out from the rest of the library staff curated content. Under the see more details link the student's

This screenshot shows a detailed view of a discussion post. The post is titled 'Add teeth to the digestive system and Muscles & Bones pages' and is by user Millie Good. The post content includes a recommendation to add 'teeth' to the library guide, with a detailed explanation of the role of teeth in the digestive system and a reference to the Encyclopedia Britannica. The post has two replies: one from David Feighan, who thanks Millie for the recommendation and supports her proposal, and another from Ellie Beni, who agrees with Millie and mentions a video about toothpaste. The interface includes navigation links like 'Back to Discussions List', 'Close Discussion', and 'Email Notifications: On'.

contribution was acknowledged. This acknowledgement was important as it made visible the validation of the student's contribution. See the following screen shot for details. The direct link to this section of the Kerferd Library LibGuide is <https://library.mentonegirls.vic.edu.au/body-systems/digestive-system#s-lg-box-wrapper-24760987>

- Teeth and gums (Britannica Middle, n.d.)   

"By cutting, tearing, and grinding food and by helping to mix it with saliva, teeth carry out the first step in digestion... The teeth of human beings also help to form the sounds of speech, and they participate in facial expression." ("Teeth and gums", n.d.)
[less...](#)

Reference / citation: "Teeth and gums", (n.d.) or ("Teeth and gums", n.d.)

Reference list / Bibliography: "Teeth and gums". (n.d.). In Encyclopedia Britannica. Retrieved from <https://bt-libproxy.mentonegirls.vic.edu.au/levels/middle/article/teeth-and-gums/277284>

This content has been curated by Millie Good.

Findings and outcomes

We discovered early on that we had to provide additional scaffolding and instruction. The issue seems to be that students are less comfortable with open-ended tasks, questions and research. Yet it was encouraging students to move beyond restricted closed tasks that inspired us to embark on this project in the first place. The Year 8 students agreed that it was harder and more challenging than a structured closed learning exercise. The final workshop involved a review and a chance to gather student feedback on what they liked and did not like about the exercise, as well as what was hard and easy to accomplish. Feedback included:

- Students saw the exercise as a class extension that gave them the opportunity to dig deeper and explore more. The exercise helped confirm what they already knew. In particular, they found it helpful to have their learning confirmed by a different information source and a different learning process.
- The students recognised that this type of research activity would not be for everybody, but once they got their heads around it they liked the idea of the research > peer review > content curation into LibGuides, and agreed it would be a good extension activity to be done in class time.
- Generally, they agreed they did learn new and additional things e.g. the connection between the digestive system and the brain became more apparent and obvious.
- While they saw this as a good exercise, they also saw it as an extra task that did not have priority over other homework.
- There were mixed views, but they seemed to reach a consensus that an improvement for 2020 would be that the teacher introduces this exercise as an extension (maybe in the second class for the topic) for students who were looking for an extra challenge.
- Ideally, they could do the research in class time rather than outside of class where they have lots of other competing activities.

From the teacher and the librarian's perspective, it was particularly interesting to see what information sources the students curated, especially when they included web resources not included in the library's collection. It was also interesting to see how much we underestimated the difficulties students had with any sort of peer review process, especially understanding the difference between criticising and critiquing. However, once we gave some practical examples of how and why the peer review process works (examples used included the 1989 University of Utah cold fusion scandal), they understood why it is important.

Of interest to this pilot project was how and why young people are motivated to engage in science and how this applies in a teacher / library learning environment. Waugh et al. (2013) explored the characteristics of what they called super-users by compiling research field notes of a student engagement in a US library based after school science program. Characteristics included (but were not limited to) seeking mastery and / or attention, sociability and community orientation, and a sense of leadership. One outcome of this pilot project is the need to better understand what motivates high achieving students to participate in additional work. For example, is it limited to the interest in additional grades, and how can we leverage this interest to keep students more motivated? It will also be of interest to see if there are gender biases, and if there are gender biases, what are they, and how can they be addressed? We will also further refine our pedagogy and consider if tools such as [Victorian Department of Education and Training Amplify toolkit](#) can be used to provide additional scaffolding and instruction.

Conclusions

As the role of libraries is questioned, and as there is ongoing pressure to deliver value, we should not ignore how we can use existing products and services in new and innovate ways to deliver better outcomes. Many libraries use LibGuides, or similar platforms, so this pilot project could be replicated and applied by others. This includes libraries outside of the K-8 Education sector. For example, universities partnering with post-graduate students to build LibGuides that support undergraduate students, or libraries in the health and/or law sector partnering with

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key practitioners to curate and build content for their broader user / patron population. Without taking away from the considerable knowledge of subject librarians, the knowledge and professional reputation of key practitioners could be something these libraries could apply in more direct and visible ways.

This pilot project confirmed how important and rewarding it is for teachers and librarians to work closely together with students. Initially the students seemed surprised they were allowed to add content into the library's study guides, and that their suggestions, work and contributions were given equal weight to those of the teacher and the librarian. Feedback also suggested that allowing students to curate and co-design the content in the library portal had additional learning outcomes. Learning in the classroom was validated, new concepts and connections

were made, and the students demonstrated higher-level cognitive skills. This pilot also demonstrated the impact and value a school library can deliver when it is more strategically and directly involved in student learning. Lastly, this pilot demonstrated that you can be innovative and transformative by using existing library collections and platforms in new ways. In light of the student feedback and what we also learnt as a teacher and a librarian, we will use the findings of this pilot to further refine our approach and partnership.

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Editor's Note: This article was originally presented at the VALA2020 Focus on the Future Conference in February 2020. It can be accessed at:

<https://www.vala.org.au/vala2020-proceedings/vala2020-session-4-feighan/>

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Appendix

Keywords / Australian curriculum alignment

All the products and services of the Kerferd Library are mapped to specific Australian Curriculum metadata. Use of this curriculum metadata is central to how the library reports on the value we deliver and the impact we have on student outcomes. See also <https://library.mentonegirls.vic.edu.au/about/strategy>. This paper is aligned to the following:

- Science inquiry skills
[[Australian Curriculum Framework S200](#)]
- Science understanding
[[Australian Curriculum Framework S100](#)]
- Inquiring – identifying, exploring and organising information and ideas
[[Australian General Capability 41](#)]
- Analysing, synthesising and evaluating reasoning and results
[[Australian General Capability 44](#)]
- Reflecting on thinking and processes
[[Australian General Capability 43](#)]

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