MONASH University

DIGITAL SKILL DEVELOPMENT (DSD) FRAMEWORK

*A **conceptual framework** for the **explicit**, incremental development of contemporary digital skills and practices for collaborating, learning, researching, working, and functioning in society.*

DSD

Scope for Student Autonomy

Applies social and ethical protocols for e-safety and well-being of self and others, taking account of digital profile, footprint and impact.

Digital Skill Facets	**Prescribed *(Follow)*** Highly structured directions and modelling from the educator prompt the learner(s) to…	**Bounded** Boundaries set by the educator channel the learner(s) to …	**Scaffolded *(Improvise)*** Scaffolds placed by the educator enable the learner(s) to independently…	**Open-ended** Learners instinctively initiate engagement with digital technology that may be guided by the educator to…	**Unbounded *(Transform)*** Learners normalise digital practices in accordance with context to…
Explore and Clarify *What is my/our purpose?* Determine the purpose for using digital technology taking into account digital practices. (i.e: e-safety, digital wellbeing, digital profile and footprint). ***Curious***	Explore digital technology for a specific task or purpose, following prescribed protocols for digital practices.	Explore a range of recommended digital technologies. Follows established protocols for digital practices.	Explore a range of familiar digital technologies based on provided criteria. Consider protocols for digital practices.	Determine own approach to exploring familiar and unfamiliar digital technologies within structured guidelines. Addresses issues related to protocols for digital practices.	Confidently determines the affordances of unfamiliar or novel digital technologies. Anticipates digital practices and protocols that might be required.
Select and Use *What will I/we use?* Choose the appropriate digital technology to use for the purpose. ***Experimental***	Use prescribed digital technology following prescribed protocols for a specific purpose.	Use familiar digital technology and apply to a defined context with targeted support when needed.	Choose a range of suitable digital technologies and applies to fulfil a specified purpose. Exploits risk-taking in the form of tinkering.	Display the confidence and adeptness to experiment with familiar and unfamiliar digital technologies for diverse purposes. Demonstrates and understands the link between actions and consequences, tolerates uncertainty.	Exploit and manipulate existing and emerging digital technologies based on a sophisticated understanding of affordances, purpose and context. Demonstrates and understands the link between actions and consequences (current and future).
Evaluate and Reflect *Will this suit my/our purpose and how will I/we know?* Critically assess and reflect on the suitability of digital technology and practices in a changing digital environment. ***Discerning***	Reflect on the suitability of digital technology and practices by following prescribed criteria. Reflect on learning in a digital context.	Appraise the suitability of digital environments and tools for learning, working, and social interaction from a range of specified criteria; reflects with conceptual guidance.	Evaluate and reflect purposefully to make informed decisions regarding the significance and benefits of tools for learning, working, and social interaction using self or co-constructed criteria.	Insightfully apply self-determined criteria drawn from the expertise of others for learning, working, and social interaction. Self regulates to consider implications of digital practices.	Critically and discerningly evaluate digital technologies; transfer self and co-generated criteria based on learning and experience to reframe processes.
Organise and Manage *How will I/we plan my approach?* Organise and manage processes, self and team function using digital strategies and systems. ***Harmonising***	Organise, plan and manage processes, self and team function using provided digital practises according to prescribed guidelines.	Organise and manage processes, self and teams choosing from a range of recommended digital systems in accordance with online protocols.	Organise and manage processes, self and teams by recalling and selecting from familiar digital strategies and systems in accordance with online protocols.	Manipulate and customise familiar and unfamiliar digital technologies and systems to organise self and team requirements. Explore new parameters and online protocols.	Embrace and encourage digital practices for organising and managing processes, self and others. Identify and manipulate the affordances and functionality of unfamiliar digital technology and systems to meet new purposes.
Synthesise and Create *What can I/we make?* Synthesise using digital techniques to create new products, understandings and solutions. ***Creative***	Create using specific digital techniques keeping to prescribed formats.	Combine specified digital techniques keeping to given formats. Identifies problems and seeks guidance.	Enable new understandings using an array of digital tools to analyse, synthesise and contextualise; troubleshoots to create solutions to known problems.	Synthesise and create using complex digital techniques involving visual, sensory, kinaesthetic and psychomotor to enable individual and team solutions according to context and parameters set. Considers implications.	Create innovate solutions for complex problems in diverse contexts by combining digital practices that include the visual, sensory, kinaesthetic and psychomotor. Transcends known parameters, embraces disruption and explores implications.
Collaborate and Communicate *How do I/we relate?* Collaborate and communicate using digital practices in digital settings accounting for e-protocols, e-safety, digital wellbeing, profile and footprint. ***Connected***	Participate and share in a specific digital environment to a restricted audience. Use prescribed e-protocols following guidelines for e-safety, digital wellbeing, profile and footprint.	Interact and share using a range of guided digital practices with a specified audience to facilitate connectedness. Takes into account e-protocols, e-safety, digital wellbeing, profile and footprint.	Recognise the affordances of digital technologies to collaborate and communicate. Demonstrates awareness of e-protocols including impact on others, e-safety, digital wellbeing, identity and integrity.	Collaborate and connect with audiences in broad and diverse contexts, using sophisticated digital practices. Actively moderates wellbeing, identity, integrity and impact in digital environments.	Exploit the digital environment. Transform, innovate and repurpose digital technologies to optimise collaboration and communication. Initiate new e-protocols and practices, regulate profile, wellbeing, identity and integrity in digital contexts. Sophisticated understanding of actions and consequences.

Digital Skill Development (DSD) framework, 2018. Developed by the DSD framework Working Group (Lyn Torres, Amber McLeod, Barbara Yazbeck, Gerry Rayner, Steven Yates, Marta Skrbis, Neil Dickson, Hannah Fulton), Monash University Australia.
Facets informed by the Research Skill Development (RSD) framework (Willison and O'Regan, 2006, 2018). More information **monash.edu/library**

Overview of the Digital Skill Development (DSD) framework

The Digital Skill Development (DSD) framework was developed through a library-led partnership of professional and academic educators at Monash University. The aim of the framework is to facilitate the conceptualisation of what it means for students to be digitally literate in a range of learning contexts. The DSD framework provides educators with pedagogical guidance in recognising, identifying, enabling and expanding the repertoire of digital skills required by students to meet the demands of learning, living and working in contemporary society. This includes consuming digital data, collaborating and creating with digital tools, whilst taking into account digital identity, wellbeing and e-safety. The DSD framework can be applied to scaffold and make explicit the incremental development of students' digital skills in existing or new curriculum by guiding educators to plan and set learning goals, frame learning tasks, activities and assessments that improve student digital skills.

The DSD framework consists of:

Skill Facets: The vertical axis of the DSD framework describes a range of higher order cognitive skills, processes and dispositions required in digital contexts. Each skill facet is represented as a complementary verb pair (e.g. Select and Use). This verb pairing is intended to capture the breadth of skills involved in that facet and illustrate the way skills develop in tandem. It is worth noting that whilst the skill facets are presented as a sequence they should not be interpreted as a linear process. When contextualised, the skills do not sit in isolation; rather, they are multi-faceted, overlapping and share elements of each other.

Scope for Student Autonomy: The horizontal axis of the DSD framework captures the 'Scope for Learner Autonomy' scaffolded within a learning continuum. The continuum articulates a developmental view of learning by describing the degree of structure and guidance required for optimal learning rather than representing learning as a hierarchy of competence. Learner autonomy depends on context, purpose and learner characteristics. It is also fluid in that within a single task a student may shift though varying levels of autonomy as they develop greater self-reliance (Willison, Sabir and Thomas, 2107).

Affective domain: The adjectives in italics, associated with each verb couplet, describe the attitude and disposition most indicative of each skill facet. The affective domain points to the importance of students recognising and developing attitudes and dispositions for learning. Incorporating affective skills, attitudes and dispositions shifts the view of learning from an educator centred one to a student-centred one, painting a picture of deeper learning.

Characteristics of the DSD framework

The DSD framework is part of the suite of skill development frameworks known as MELT (Models of Engaged Learning and Teaching) https://www.adelaide.edu.au/rsd/. These include the Research Skill Development (RSD) framework (Willison & O'Regan , 2006, 2018) and the Work Skill Development (WSD) framework (Bandaranaike & Willison, 2009, 2018; revised by Monash University Library, 2019) https://www.monash.edu/library/skills/rsd. The DSD framework shares the same parameters and characteristics as the MELT frameworks and can be used in conjunction with them when digital skills require emphasis. Below are the characteristics common to all MELT frameworks.

They are...

Conceptual models
Pedagogical tools
A learning continuum
A tool to inform assessment and curriculum design
Flexible, adaptable, dependent on context
Applicable to a range of curricula and learning contexts
A common language amongst educators
In synergy with educational strategies

They are not intended to be...

An assessment rubric
Prescriptive and inflexible
Lock step
The last word on skill development

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An example of applying the DSD framework for assessment: Assumptions about student digital competence mean there is little explicit instruction of digital skills required for units, which impact student academic achievement in much the same way as academic skills (e.g. critical thinking, communication skills). Consider the skills involved in a group presentation assignment where students need to find and access credible academic resources (library website, other search sites), communicate with their group (messaging apps, collaborative online documents), and use presentation software (open response quiz, presentation software). For this example, the DSD framework helps highlight assumptions, encourage evaluation of student digital skills and inform unit content.

(McLeod, A. 2019)

	Prescribed	Bounded	Scaffolded	Open-ended	Unbounded
Explore and Clarify *What am I using this tech for?*	You were told your purpose is to make a **microbit** display a heart. You don't feel confident to explore on your own. You don't really understand or wonder why you are doing this activity.	You were required to program a **robot** to move around an obstacle course using block coding. You are directed to the correct app and have been given basic instructions but you feel confident enough to vary them. You can imagine how this could be used for different tasks.	You have been asked to **create a website** using any platform. You play with a few web hosting sites you've used before to decide which is right for this task.	You have been asked to do an **oral presentation** but told you were not allowed to use PowerPoint. You searched for and tried out some different technology to see which seemed most suitable for the task.	You identified some technology you had not encountered before and there was no one around to ask about it. You thought it looked interesting and started to play with it and explore its functions. You considered what purposes this technology might be suitable for and compared it to other similar technologies.
Select and Use *What tech will I use?*	You needed someone to give you step by step instructions on how to search for references using the **library database.**	You were told which app to use to create **augmented reality** and given paper and pens to create the trigger image. You needed a demonstration of how to use it and the teacher was available if you had questions.	You chose from a list of **digital story** apps provided for your assignment. You are confident enough to explore all affordances of the app you have chosen.	After playing around with a number of ways to make videos you have chosen to use **iMovie.** You're confident because you've played with similar things before. You have found help and instructions online and after a bit of trial and error you can work out how to use it yourself.	You had no trouble figuring out how to use and program a new **robotic arm** because you have been exposed to lots of similar technology before. You immediately started thinking about how it could be combined with other technology for new purposes.
Evaluate and Reflect *How do I know if this suits my purpose?*	After creating graphs in **Excel** you have responded to a survey looking at the advantages of using a spreadsheet to manipulate data over a calculator, pen and paper. You felt positive/ apprehensive about using Excel.	Your tutor introduced you to some new **presentation software** in class. When asked, you explained whether you liked this technology based on ease of use and whether you could see a use for it.	Your group chose to **use Facebook messenger** to communicate for an upcoming task. You reflected on how useful it is in terms of learning, working, social interaction compared to other more familiar programs like Google Docs.	You started reflecting on **Survey Monkey** as soon as you opened it and can clearly explain why you like/dislike this tech and what it could be used for. You anticipated issues as they arose.	Based on your extensive experience with a wide range of digital technology, you evaluated a new **instant response online quiz** program against others and knowledgeably discussed the benefits/drawbacks/uses.
Organise and Manage *How will I plan my approach?*	After being asked to create a game in **Scratch** in your tutorial, you and your partner did not know where to start. You waited to be told what the first step was.	You and your group decided to store and share your documents for a group assignment on **Google Docs** in a team folder. You were aware that theoretically, you should have been able to work this out and find a relevant YouTube clip, but you still needed to ask for help.	You and your partner needed to create something using the **3D printer.** You discussed whether you had seen anything similar before and drew on each other's experiences/expertise to figure out how to use it.	In a group assignment you needed to find a way to share references and notes with other group members. You had sufficient experience playing with new technologies to work out an approach with your group which you are confident will succeed. You were aware of things you should try or avoid and decided to use **EndNote.**	Your group decided to analyse data with **NVivo.** You were so experienced with exploring new technologies that you immediately planned your approach and allocated tasks to team members. You thought about the way Nvivo can be categorised and other technologies that are related. You stored this information for later use.
Synthesise and Create *What can I make?*	You followed instructions to create a graph in **Excel** in class.	You inserted a **video** in to **presentation software**. If you had questions you asked the tutor.	After collecting data online using **Qualtrics** you used **SPSS** to analyse it. You watched instructional YouTube videos to help when you were stuck.	You created a **VR** experience using **Google Expeditions** because you liked the feel, size and ease of use of the program.	Using blue sky thinking, you thought of novel solutions to problems using existing and new technology.
Collaborate and Communicate *How can I use this to communicate?*	In the tutorial, you designed and created a game controller for Pacman using **Makey Makey**. The controller itself communicated your level of achievement.	You were able to join a **Zoom** meeting that had been set up by your tutor and understood that you could share your ideas using this technology. You have an understanding of digital etiquette.	You posted a picture you had edited on **Instagram** and explained what it was and why you liked it. You were aware of eSafety and digital wellbeing.	You used an online **flow chart** program in class to share information and processes. You thought about doing the same activity with your family and sharing your ideas with them.	You repurposed a **microbit** (attaching wheels to make a vehicle) and posted it on an online forum where you encouraged others to comment and create their own microbit activities.

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