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## In defence of inquiry-based pedagogies

Dr Robert Stevens

### [In defence of inquiry-based pedagogies](#)

**Robert Stevens, Manager, Research in School Policy and Information Management in the NSW Department of Education**

Debate has raged for more than a century about which pedagogical approach is better – direct instructional guidance or minimally guided, for example, inquiry-based instruction.

An example of a direct instructional guidance is Direct Instruction. Direct Instruction aims to accelerate learning through clearly scripted direct instruction by the teacher and scaffolded practice aimed at student involvement and error reduction (van den Broek, 2012).

An example of inquiry-based (and minimally guided) instruction is Socratic Pedagogy. Matthew Lipman and Ann Sharpe developed and refined a dialogue-based inquiry approach to teaching critical thinking called Philosophy for Children – a paradigm example of Socratic Pedagogy. The approach is based on a ‘community of inquiry’ in which children learn critical and creative thinking by listening to one another with respect, working with one another, building on one another’s ideas, challenging one another to supply reasons for otherwise unsupported opinions, assisting each other in drawing inferences from what has been said, seeking to identify one another’s assumptions and suggest alternatives (Lipman, 2003).

In this paper, I will suggest that the question ‘Which of the two pedagogies is better?’ is the wrong question.

Kirschner, Sweller and Clark argue that direct instructional guidance is superior to unguided or minimally guided instruction. Minimally guided instruction is less effective and less efficient than instructional approaches that place a strong emphasis on guidance of the student learning process (Kirschner et al., 2006). This claim is based on two further arguments:

1. Unguided or minimally guided instructional approaches ignore the structures that constitute human cognitive architecture.
2. Evidence from empirical studies over the past half-century supports the relative efficiency of direct instructional guidance.

In relation to the first of these arguments, Kirschner and his colleagues define direct instructional guidance as providing information that fully explains the concepts and procedures that students are required to learn (that involves change in long term memory). Kirschner and his colleagues argue that minimally guided instruction does not take account of characteristics of working memory, long-term memory, or the relations between them. They argue human perception and cognition are critically dependent on long-term memory. When processing novel information, working memory is very limited in duration and in capacity. Minimally guided instruction overly taxes our limited working memory, so that long-term memory is not changed. All instruction aims to alter long-term memory. If nothing has changed in long-term memory, nothing has been learned.

In relation to the second argument Kirschner and his colleagues cite evidence that controlled experiments almost uniformly indicate that when dealing with novel information, learners should be explicitly shown what to do and how to do it.

### Guided Instruction – better for what?

Kirschner and his colleagues claim that minimally guided instruction is less effective and less efficient than instructional approaches that place a strong emphasis on guidance of the student learning process (Kirschner et al., 2006). If we see pedagogies as tools for learning, this claim is on a par with the assertion that a hammer is less effective and efficient than a screwdriver. In response to this claim, we might ask ‘for what?’ For driving in nails, a hammer is better. For adjusting screws, a screwdriver is better. So, for what is strongly guided instruction better? It appears that Kirschner and his colleagues are claiming that strongly guided instruction is better than minimally guided instruction for memorisation and recall of novel content. It would also be better for teaching and learning the technical aspects of reading, writing and numeracy.

### Problem solving

Is direct instructional guidance more effective and efficient in teaching and learning of problem solving? Kirschner and his colleagues suggest a direct instructional guidance using worked examples is a more efficient and effective way of teaching and learning problem solving than minimal guidance. Where an activity involves solving problems with one right answer and one tried and true way of reaching that answer, direct instructional guidance may be the best way to facilitate learning in that activity. But where there is no agreed solution to a problem, where the problem is complex and messy, or where there is no generally accepted algorithm for solving that problem, perhaps a less direct approach is called for, such as philosophical dialogue, problem based learning or project based learning.

A worked example of a solution to a philosophical problem, for example, a mathematical paradox, is not really feasible since there are no agreed solutions to these problems. Nonetheless, studying philosophical problems and investigating various solutions to them, can provide valuable insights into key concepts at the core of a range of disciplines.

## Deep and surface learning

Surface learning involves initiation to new ideas. It begins with the development of a conceptual understanding, and then, at the right time, labels and procedures are explicitly introduced to give structure to concepts. Surface learning is the introductory level of learning (Hattie, Fisher & Frey, 2017 p. 23).

The deep phase of learning provides students with opportunities to consolidate their understanding and make deeper connections among ideas (Hattie, Fisher, & Frey, 2017 p. 30).

Students move to deep learning when they plan, investigate, and elaborate on their conceptual understandings, and then begin to make generalisations. It involves students taking surface knowledge (which includes conceptual understanding) and, through the intentional instruction designed by the teacher, seeing how their conceptual understanding links to more efficient and flexible ways of thinking about the concept (Hattie, Fisher, & Frey, 2017 p. 32). Deep learning focuses on recognising relationships among ideas. During deep learning, students engage more actively and deliberately with instruction in order to discover and understand the underlying structure of the subject under consideration.

Direct Instruction might be an appropriate approach to surface learning.

Hattie notes that the deeper phase of learning is accomplished when students work collaboratively with their peers, practising together, through inquiry-based or dialogic approaches. Practices associated with deep learning include: Constructing viable arguments and critiquing the reasoning of each other and displaying, explaining and justifying ideas and arguments using precise language in written or oral communication. This practice requires students to engage in active discourse. Discourse reaches beyond discussion because it includes ways of representing, thinking, talking, agreeing and disagreeing (Hattie, Fisher & Frey, 2017 p. 136).

Hattie and his colleagues distinguish direct instruction from dialogical instruction. Through direct instruction students learn from:

- (a) watching clear, complete demonstrations of how to solve problems with accompanying explanations and accurate definitions;
- (b) practising similar problems sequenced according to difficulty; and
- (c) receiving immediate corrective feedback.

Through a more minimally guided dialogical instruction, students learn from:

- (a) actively engaging in problem solving, persevering to solve novel problems;
- (b) participating in a discourse of conjecture, explanation and argumentation;
- (c) engaging in generalisation and abstraction, developing efficient problem solving strategies and relating their ideas to conventional procedures; and to achieve fluency with these skills,
- (d) engaging in some amount of practise (Hattie, Fisher & Frey, 2017).

Hattie notes that differences between the direct and dialogic methods are the types of tasks students are invited to complete and the role of classroom discourse, collaborative learning and feedback (Hattie, Fisher & Frey, 2017).

Hattie suggests that Direct Instruction is more appropriate for surface learning. Dialogical Instruction is more appropriate for deeper learning.

## Effect Sizes

Hattie has found that Direct Instruction has an effect size of 0.59. Dialogic Instruction has an effect size of 0.82 - double the effect size of 0.4, which is generally regarded as one year's teaching for one year's growth. Dialogic Instruction is a form of what Kirschner and colleagues would classify as minimally guided instruction or inquiry learning. Yet it has a higher effect size than Direct Instruction. Sijin Yan and colleagues recently found in a meta-analysis of ten studies of school aged children that Philosophy for Children has an effect size of 0.58 on students cognitive learning outcomes and 1.06 on reasoning skill (Yan, Walters, Wang & Wang, 2018). This is in tension with Kirschner and his colleagues' claim that 'controlled experiments almost uniformly indicate that when dealing with novel information, learners should be explicitly shown what to do and how to do it'.

## Not either or but both and

Hattie observes that the higher effect size of Dialogic Instruction does not mean that teachers should always choose this approach over another. It should never be an either/or situation. Rather it should be a both/and situation. The art of teaching involves teachers choosing the right approach at the right time to ensure learning, and understanding how both dialogic and direct approaches have a role to play throughout the learning process, but in different ways.

Nor should teachers confine their practice to direct and dialogic pedagogies.

People learn through the following activities: reading; writing; listening; discussing; experimenting; modelling; designing; making. Pedagogies can be seen to consist of combinations of these learning activities, and can be distinguished by the activity they emphasise. An activity-centred approach to the design and analysis of learning situations

views activity as a mediator between tasks, tools and resources, interpersonal relationships and learning outcomes (Goodyear & Carvalho, 2014).

The following table outlines pedagogies distinguished in terms of the learning activities that characterise them.

| <b>Pedagogy</b>             | <b>Characterising learning activity</b> | <b>Examples</b> |
|-----------------------------|---|-----------------|
| Direct/explicit instruction | Listening                               | Lecture         |
| Socratic pedagogy           | Discussing                              | Tutorial        |
| Project-based learning      | Researching                             | Project         |
| Inquiry-based learning      | Experimenting                           | Practical       |
| Learning by design          | Designing                               | Design workshop |
| Apprenticeship              | Making                                  | Demonstration   |
| Hands-on learning           | Manipulating an object to think with    | Simulation      |

Table 1: Pedagogies and learning activities

The art of teaching involves understanding what strategies to implement when and for what purpose.

Each of these pedagogies is tried and true and have been practised for generations. They have different purposes. Why should we privilege any one over another?

Using dialogic instruction (to promote deep learning) with direct instruction (to promote surface learning) enables us to meet Kirschner and colleagues' challenge to explain how inquiry based or dialogic instruction circumvents the limits of working memory when dealing with novel information. It does so by combining with direct instruction to go deeper. Direct instruction provides a surface knowledge as a basis for deeper knowledge, gained through dialogic instruction.

## Teaching skills

Is direct instructional guidance superior to minimally guided instruction for teaching skills? Again, it depends which skills we are talking about.

Kirschner and his colleagues seem to suggest that memorisation and learning is a passive process of seeing or hearing and remembering – such as memorisation of nonsense syllables by rote. Learning/remembering how to do something (as Kirschner and his colleagues recognise) requires practising that skill, as distinct from simply memorising instructions about how to do it. It may facilitate memory/learning to be shown how to do something, but it is practise that mediates memory and learning. Kirshner and his colleagues suggest that learning is passive assimilation of information (content). Knowledge is transmitted from teacher to student. But in learning, especially learning how, practise makes perfect. When it comes to learning how to do something we learn by doing it - and often doing it together in a community of practice. We learn to ride a bike in small part by guided instruction and in large part by practise and often together in a community of practice. Many skills we learn by mucking in and giving it a go, often with minimal guidance, though the degree of guidance depends on the activity being learned.

Learning to play chess well does not typically involve direct instructional guidance. Beyond learning the rules of chess, mostly by direct instruction, learning to play chess well requires playing lots of games and studying the (sometimes annotated) games of experts. Learning chess well may benefit from studying worked examples, and from coaching, but this involves the study (playing over) of games or stages of games. Chess players build up their long term memory by practise – playing (or playing over) thousands of games.

We learn chess together. Learning chess cannot be an entirely solitary exercise. We typically play chess with a human (or human designed) opponent. Masters write books on chess (generally lightly annotated games).

In learning some skills – such as the technical aspects of writing, for example, spelling and punctuation – direct instructional guidance facilitates practise. In learning other skills – such as creative writing, re-expressing and refining a text, or writing poetry – practise makes perfect, and beyond helpful hints and tips, direct guidance is not all that helpful.

In teaching students how to think well, a teacher may be able to model critical and creative thinking. But it is practise – in a community of inquiry – that makes perfect here, too.

Guidance and practise are key components in learning a skill. But the intensity of the guidance necessary varies from skill to skill. In most cases, though, a large amount of practise is necessary, often in a community of practice.

## Summary

Direct instructional guidance is an appropriate pedagogy for memorisation of content, and for teaching technical skills and procedures. It is suitable for teaching students how to solve problems with clearly defined solutions. It is suitable for teaching surface knowledge.

Inquiry based pedagogies are suited to learning more complex and contested concepts and for teaching skills that are learned largely by practice in a community of practice. It is suited to cultivating deep content knowledge, and addressing problems that do not have widely agreed solutions.

Direct instructional guidance and minimally guided instruction should be practiced along with other pedagogies in a complementary way – not either or, but both and.

## References

Goodyear, P. & Carvalho, L. (2014). 'Framing the analysis of learning network architectures'. In L. Carvalho & P. Goodyear, *The architecture of productive learning networks* pp. 48-70. New York: Routledge.

Hattie, J.A., Fisher, D.B. and Frey, N. (2017). *Visible learning for mathematics grades K-12: What works best to optimise student learning*. California, United States of America: Corwin.

Kirschner, P.A., Sweller, J. and Clark, R.E. (2006). '**Why minimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery, problem-based, experiential and inquiry-based teaching.**' *Educational Psychologist*, 41(2), 75-86.

Lipman, M. (2003). *Thinking in education*. New York: Cambridge University Press.

van den Broek, G. (2012). '**Innovative research based approaches to learning and teaching.**' *OECD Education Working Papers*, No. 79, OECD Publishing.  
<http://dx.doi.org/10.1787/5k97f6x1kn0w-en>

Yan, S., Walters, L.M., Wang, Z, Wang, C. (2018). 'Meta-Analysis of the effectiveness of philosophy for children programs on student cognitive outcomes.' *Analytic Teaching and Philosophical Practice*, 39(1), 13-33.

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## [Free your inner writer - strategies for writing engaging journal articles](#)

**Dr Hilary Hughes, Adjunct Associate Professor at the Faculty of Education, QUT**

It's not too late to add 'writing for publication' to your list of new year's resolutions. You may well find it an easier goal to achieve than giving up chocolate or exercising every day. Most of us have an inner writer that we promise to let free 'one day' – why not this year? As you plan professionally for 2019, a key goal could be to write at least one article for a journal like Scan.

### Benefits of writing for a journal

Writing for a journal brings many benefits, both personal and professional. As a creative outlet, writing can boost your own wellbeing. From a personal perspective: 'Publishing is proof that you take your profession seriously, that you give it time and thought, and that you are an active and engaged participant in your profession' (Buzzeo, 2011, p. 13). Through journal articles you can reach a wide audience, beyond your immediate school. They allow you to value-add work you've already done, for example by reworking a report or workshop presentation. Through your writing, you may become known as an expert on particular topic(s). Building a professional profile in this way may broaden your employment options and lead to invitations to speak at conferences or present workshops (Rankin, 2018).

For teacher librarians, you can make a lasting impact by authoring an article that opens a window on contemporary school libraries. Through your article, you can report and explain current professional practices, highlight positive outcomes, debate challenges, and perhaps influence further innovation (Buzzeo, 2011; Hibner & Kelly, 2017). You can demonstrate how teacher librarians are energetic, forward looking, thoughtful and socially minded professionals. (And help banish the tired stereotypes!)

The catch phrase 'publish or perish' indicates the importance of writing for the sustainability of the profession and your own career, whether in schools or higher

education (Schaberg, 2016). Teachers and teacher librarians are often abuzz with creative ideas and have a significant impact on student learning and wellbeing, yet sometimes these contributions seem to go unnoticed. By writing about your innovative programs and initiatives, and their positive outcomes, you raise general awareness of the value of your role and offer models for others to follow.

Good journal articles get people thinking and talking. They can be a powerful form of advocacy that showcases school library activities and their benefits for students and the whole school community. You can use articles to both provide evidence of your own excellent practice and also to demonstrate more broadly how teacher librarian practice meets the **Australian professional standards for teachers**(AITSL, 2017).

The process of writing articles supports your professional development. It can provide a focus for reflection on your teaching practice and improve your ability and confidence to argue a convincing proposal. Writing is also a great basis for collaboration. Depending on the topic, you might write with other teachers or teacher librarians, colleagues, parents, academics or even students. The sharing of different information and viewpoints through collaborative writing could expand awareness of key areas of professional practice with co-authors beyond your immediate teaching area.

### Write for insight and delight

Having set your writing resolution, what will you write about? Like a novelist, you can explore your experience and what is happening around you. For teacher librarians, this might include:

- the design, implementation and evaluation of an innovative school library program
- evidence based teacher librarian practice – findings and implications
- selection and implementation of a new library management system
- (re)design of the library – process and outcomes.

Aim to provide your readers with insight and delight, so that they gain new information or understanding, as well as enjoyment, from your article. The trick is to make the content interesting, practical and relevant. An effective article goes beyond describing what you did and how, to why you did it and ways it could be applied in other school contexts. Real life examples; small, vivid stories; and pithy quotes capture readers' attention, while practical tips or a practice framework help them see the applicability of your findings. If allowed by the journal, well presented photos and diagrams can further enliven a written piece.

A catchy title is great for grabbing readers' interest, especially if it teases a little while still conveying the essence of the content. That is why Trent Dalton's 'Boy Swallows Universe' (2018) is such a clever title. Similarly, these two Scan article titles exemplify reader-enticing titles: **School libraries as incubators – where good ideas hatch!** (South, 2017) and **Curiouser and curiouser ... a reading wonderland** (Sly, 2012). You can also be creative with section headings, as long as they are also indicative of the section content.

A well signposted structure for the whole piece – and a clearly expressed line of argument – are important for holding readers’ attention beyond the title and introduction. Like an inquiry learning project, it is generally effective to build the argument around an explicit question or problem statement. Developing an article outline before the writing begins helps maintain focus. Take care also to book-end the discussion with an interesting and informative introduction that sets the scene and indicates the purpose of the article, and a strong conclusion that explicitly summarises the main points and resolves the argument. Where possible, end the article on a high note to inspire readers. For example, this article concludes by proposing that: ‘As highlighted, writing journal articles can be an enjoyable creative activity that is personally and professionally rewarding’. This is preferable to saying something similarly accurate but more negative like: ‘Writing journal articles is challenging and producing publishable articles requires a great deal of hard work’.

Meaningful section headings are also useful guides to the unfolding argument. Let each paragraph address (only) one main idea, introduced with a topic sentence – a sentence that clearly signals what the paragraph is about.

Judicious use of the literature adds weight to the article’s argument. A few well-chosen references, integrated into the discussion to support key points, generally have more impact than a string of ‘possibly relevant’ citations that tend to interrupt the flow. It is more meaningful to lead sentences with a concept rather than a citation. For example, in the following sentences, the first is more compelling:

- ‘A library as incubator is a great opportunity for the space to facilitate learning by students and teachers that reflect their passions and interests’ (South, 2017).
- According to South (2017), ‘A library as incubator is ...’.

For professional and academic writing, accurate and consistent referencing is a hallmark of authoritative writing.

In general, for a quality journal, aim for an accessible but professional-scholarly tone. (Teachers interested in writing for Scan could also consult the [NSW Department of Education content style guide](#), [Content guidelines](#), and [Tone of voice guidelines](#).) As a rule of thumb, avoid highfaluting academic jargon. A clear and lively style, with short(ish), logically linked sentences, is usually more effective for conveying new or complex ideas. For clarity and immediacy, active voice is generally preferable to passive voice. For example, ‘The leadership team decided to fund the project’ is preferable to ‘It was decided to fund the project’.

Some of the resources referenced below provide more extensive guidance about the writing process, including choosing and communicating with a journal, deciding the topic, and crafting the title (de Castro, 2009; Hibner & Kelly, 2017; Murray, 2013; Rankin, 2018).

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*Editor's note: Considering writing for Scan? Email your ideas and a brief article outline to us at [Editor.Scan@det.nsw.edu.au](mailto:Editor.Scan@det.nsw.edu.au) before you start writing. We can supply our writer guidelines, offer support, and provide up-front feedback to help shape the writing process.*

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## Free your inner writer

Now it's time to get creative! Rest assured that writing comes more easily to some people than others and always improves with practice. Try to think of it as a fun activity, as an opportunity to share and communicate with others, not as a daunting or dreary solitary task. You might find it helpful to set up a reciprocal arrangement with a critical friend or trusted colleague to read and provide constructive feedback on each other's work, as suggestions rather than corrections (Dawson, 2017).

There is no right or wrong way to do writing. Some people find it helpful to get into the habit of writing for half an hour each day at the same time, whereas others prefer longer periods when the mood takes them. If you find it hard to get started, try a few minutes of 'free writing', jotting down whatever comes into your head, to get the creative juices flowing (University of Richmond Writing Centre, n.d.). If you are still feeling 'blocked', allow yourself some time-out and try again later. Forcing yourself to write is generally counterproductive and unnecessarily frustrating.

## Conclusion

This article has offered teachers well proven strategies for writing impactful and enticing journal articles. The key suggestion is to present intended readers with a clearly expressed and logically structured response to a well-defined question or problem statement. As highlighted, writing journal articles can be an enjoyable creative activity that is personally and professionally rewarding.

## References and further reading

- Australian Institute for Teaching and School Leadership (AITSL). (2017). **Australian professional standards for teachers**.
- Buzzeo, T. (2011). An open invitation: Write for your profession. *School Librarian's Workshop*, 31(4), 13.
- Dalton, T. (2018). *Boy swallows universe*. Sydney: Harper Collins.
- Dawson, C. M. (2017). *The teacher-writer: Creating writing groups for personal and professional growth*. New York, NY: Teachers College Press.
- de Castro, P. (2009). *Librarians of Babel: A toolkit for effective communication*. Cambridge, MA: Elsevier.
- Hibner, H. & Kelly, M. (2017). *Taking your library career to the next level: Participating, publishing, and presenting*. Cambridge, MA: Chandos.
- Murray, R. (2013, September 7). **Writing for an academic journal: 10 tips**. *The Guardian*.
- NSW Department of Education. (2017). **Content guidelines**(only accessible by teachers employed by the NSW Department of Education).
- NSW Department of Education. (2019). **NSW Department of Education content style guide** (only accessible by teachers employed by the NSW Department of Education).
- NSW Department of Education. (2019). **Tone of voice guidelines** (only accessible by teachers employed by the NSW Department of Education).
- Rankin, J. G. (2018). *Sharing your education expertise with the world: Make research resonate and widen your impact*. Boca Raton, CA: Routledge.
- Schaberg, C. (2016, February 15). **Publish or perish? Yes. Embrace it**. *Chronicle of Higher Education*.
- Sly, C. (2012). **Curiouser and curiouser ... a reading wonderland**. *Scan*, 31(1).
- South, S. (2017). **School libraries as incubators – where good ideas hatch!***Scan*, 36(1).
- University of Richmond Writing Centre (n.d.). **Freewriting: A way around writer's block**.

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## SPaRK - United Nations Sustainable Development Goals projects

**Leonie McIlvenny, Director of StudyVibe**

### Resource overview

Based on the United Nations Sustainable Development Goals, this **website** provides an authentic context to deliver a fully integrated inquiry and problem-based learning program. The project is also designed to support the Global Goals Challenge and the UNESCO Global Education First initiatives. In addition to an extensive collection of resources that relate to the UN Sustainable Development Goals, there is also a 'Digital passport challenge', designed to encourage students to explore the Goals at a deep level using a range of technology tools. The program can be adapted to support students in Years 5-12.



### The United Nations Sustainable Development Goals project

## Educational significance

Not only are the United Nations Sustainable Development Goals a worldwide initiative to address 17 challenges facing the world today, they also provide an excellent opportunity for students to engage in, and take action about, real-world problems occurring not only in other places around the world but in their own communities. Global education initiatives and programs, as well as rich authentic resources give educators an opportunity to engage in innovative pedagogical approaches to learning, including inquiry and problem-based learning, and global collaboration. The Goals provide an authentic context in which to address learning outcomes across multiple learning areas and general capabilities.

## Suggestions for using this resource

There are multiple ways that this resource can be used by students and teachers.

Students can:

- access the carefully curated resources that support each of the UN Sustainable Development Goals (SDGs) to research. (See the [Life below water](#) example).
- use provided key words and focus questions for each goal to springboard an inquiry or investigation. (See the [Life on land](#) example).
- engage in the **10 Challenges**. For example, **Challenge five** requires students to source Creative Commons images that reflect their chosen goal and place in a photo montage or slideshow on their website or blog.
- explore a digital tool. For example, **Challenge three** requires students to develop a vocabulary / key word list related to a UN goal and use a word cloud developer (like Tagxedo) to create a word cloud.
- access the [Challenge handbook](#) that steps them through to Challenge 10 which is the culmination of the project.
- gain extensive information from [websites](#), articles, reports, [documents](#) and [videos](#) to inform them of the current world situation as it relates to the Goals.
- develop skills when using a range of technology tools, such as [Interactive images](#), to explore the goals and complete the challenges.

EarthAgain, in '[UN Sustainable Development Goals | Life below water \(14\)](#)', (1:18) talks about the fourteenth of the sustainable development goals, which is all about supporting life below water and keeping water sources clean.

Teachers can:

- encourage students to undertake research tasks around understanding one or more of the UN Goals. [The inquiry learning](#) and [problem-based learning](#) sections provide support in this area.
- access one or more of the [global programs or projects](#) listed on the website. For example, on the [iLearn.org](#) website, groups might participate in the [One day in the](#)

life project that currently has 68 countries involved where students exchange photographs/images describing days in their lives, and then make cross-cultural comparisons.

- use the outcomes and activities listed for each goal to engage in classroom activities that they devise. For example, for the **Clean water and sanitation** goal, one of the activities is to ‘Calculate one’s own water footprint (WF)’.
- target a viewing activity from the extensive range of **videos** – students answer teacher-generated questions or students develop one question each and combine them to make a class set of questions.
- adopt or modify **project ideas** that are provided in the **Curriculum and pedagogy** section.

### Teaching activities

Teachers can become better informed about the **UN Sustainable Development Goals** (SDG) by interrogating the links, videos, reports and presentations supplied for each of the goals. They may then adopt one of the **project ideas** provided for their class, for example, ‘One day in the life’.

#### *Focus on interconnections*

‘**One day in the life**’ is a project in which students exchange photographs/images describing days in their lives, and then make cross-cultural comparisons. Students may discuss aspects of a typical day or they may document special days and promote global communication through online forums.



The project would be part of a case study of **one place** in the world. Students use the geographical inquiry process to show the recreational, cultural and/or leisure activities found there. Describe the impact of personal connections on the place now, and predict they will be in future by researching:



- How are people and places connected?
- What role does technology play in connecting people to people in other places?
- What are the consequences of a globally connected world for people and places?
- Why are interconnections important for the future of places and environments?

Report case study findings in a digital poster.

## Syllabus links

### *Geography Stage 4*

A student:

- Describes processes and influences that form and transform places and environments GE4-2.
- Explains how interactions and connections between people, places and environments result in change GE4-3.
- Acquires and processes geographical information by selecting and using geographical tools for inquiry GE4-7.
- Communicates geographical information using a variety of strategies GE4-8 (ACHGK065, ACHGK069).

### *Focus on STEM*

SDG Assessment – Students conduct an inventory on what their school is already doing on the 17 SDG themes in education and operations. The results can be shared via social media or an interactive website and feed into other STEM projects, such as, **Ambarvale High School – Improving our school (IoS.1)**.

### *Science Stage 4*

A student:

- identifies questions and problems that can be tested or researched and makes predictions based on scientific knowledge SC4-4WS
- selects and uses appropriate strategies, understanding and skills to produce creative and plausible solutions to identified problems SC4-8WS

### *TAS Stage 4*

A student:

- applies design processes that respond to needs and opportunities in each design project 4.1.1
- generates and communicates creative design ideas and solutions 4.2.1
- selects, analyses, presents and applies research and experimentation from a variety of sources 4.2.2.

## Mathematics Stage 4

A student:

- collects, represents and interprets single sets of data, using appropriate statistical displays MA4-19SP.

### Experimenting

The purpose of the website is to encourage students to think creatively and ideate and innovate ideas on how to help achieve the UN Sustainable Development Goals. It encourages students to ‘think outside the box’ and perhaps devise solutions to problems that affect their immediate community or environment. The resources provided on the website are merely a catalyst to exploring real problems in a global context.

The United Nations video, ‘[What is sustainable development?](#)’ (2:08), explains the sustainable development global goals.

As students undertake the ten challenges, they are required to build a website or blog and embed various digital elements into it. For example, videos, image galleries, word clouds, interactive images and blog posts. This could be expanded to allow students to experiment with digital tools like [interactive timelines](#), [animation tools](#) and [avatars](#) to create information products that could be showcased on their websites.

The **final challenge** has the following scenario:

‘If you were given five million dollars to help achieve one of the UN development goals what would you do? In which country would you do it? and Why in that country?’

This challenge could be modified to address a local issue in the immediate community in which your students live. The project planning guide is editable and can be modified as required to suit your local context.

### Syllabus links

The SDG challenges have applications across curriculum, with relevance to subjects such as science, mathematics, geography, TAS and visual arts, and the cross-curriculum priority of sustainability. They also have direct links to the [general capabilities](#) from the Australian Curriculum, including critical and creative thinking, ethical understanding, and information and communication technology capability.

## References and further reading

**Ambarvale High School – Improving our schools (IoS.1)**. *STEM: Science Technology Engineering Maths*. © State of New South Wales (Department of Education), 2017.

Global SchoolNet. (2019). **GlobalSchoolNet.org: Linking kids around the world**.

International Education and Resource Network. (n.d.). **iEARN projects align to the UN Sustainable Development Goals**.

International Education and Resource Network. (n.d.). **One day in the life**.

Mcllvenny, L. (n.d.). **The United Nations Sustainable Development Goals project**.

UNESCO. (2016). **Global education first initiative**.

United Nations. (2015). **What is sustainable development?**

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