


Scorpio Technology NEWSLETTER INSIDE THIS ISSUE



WELCOME

April was a challenging month for everyone. We hope you have been able to find ways to engage your students and continue to provide a quality programme outside the traditional classroom.

As always, we are here to help, so if you have any issues or questions, don't hesitate to contact us at (03) 9802 9913 or sales@scorpiotechnology.com.au

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TEACHER CONFERENCES & WORKSHOPS



Scorpio is attending or supports these Design & Technology teacher activities:

[DATTA VIC](#) - ~~Friday 1-05-2020~~ *Design Interruption*, **Cancelled**

[DATTA QLD](#) - ~~25/26-06-2020~~ *Creative Integration*, **Cancelled until 2021**

[DATTA WA](#) - ~~03-07-2020~~, Edith Cowan University, Mt Lawley, **Cancelled**

[SCITECH 2020](#) - 12-9-2020, Conference for Science & Technology Teachers, Daramalan College, Dickson Canberra

[DATTA AUSTRALIA](#) - Design & Technologies Week

[ITE \(NSW\)](#) - 25 to 27-11-2020

[DATTA VIC](#) – 12-2020 Makerspace

PRIMARY: STE(A)M- TIME

Time is a great topic that students can pursue while classes are occurring offsite.

We can suggest some activities to get you started.

- Make a sandtimer/hourglass from two plastic bottles. Fill with available products e.g. rice, lentils. Use a timer to measure how long it takes to empty one side. Research how to slow or quicken the speed.
- Make an analogue clock using Scorpio's components.

Clockmaking can be used in almost all subjects and tailored to skill levels in the middle and upper school. Clock making develops the student's imagination, research, design, planning and manufacturing skills, using readily available materials. An added bonus is that it is a cost effective unit of work which provides a useable end product.

To assist you during the offsite learning stage we can pack the components separately for each student so that you can quickly distribute them. **Free service** available only during offsite learning.

CD CLOCK (Code: **CDCLOCK**) and **LP CLOCK** (Code: **LPCLOCK**)

- includes a MSSS Quartz Clock Movement, Hanger Bracket, CD Washer, Second Hand and a choice of 2 styles of Hour & Minute hand. Self-adhesive numerals can be purchased separately. Teacher notes are supplied. Suits Ages 10+

LEMON CLOCK (Code: FSG3306)

- Simply add your own lemon to turn this kit into an amazing lemon-powered clock.
- Discover the science of batteries (it has none)
- Only uses the chemical power of the lemon



LEARN TO MAKE,
MAKE TO LEARN



Play is the highest form of research.

Albert Einstein



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SECONDARY: WHAT'S NEW?

Tools

Scorpio has added to its stock range:

SCREWDRIVER PHILIPS HEAD#0 X 60MM

(Code: SCREWDRPH0/60) Price: \$5.95

SCREWDRIVER PHILIPS HEAD#1 X 80MM

(Code: SCREWDRPH1/80) Price: \$6.95



Trade quality insulated screwdrivers which are some of the most comfortable screwdrivers. The ergonomic handles have a soft rubber coating for a secure, comfortable grip that can be used for hours on end. All are TUV and GS approved and rated up to 1kV.

SCREWDRIVER PHILIPS HEAD#1 X 100MM

(Code: SCREWDRPH1/100) Price: \$9.90



Stanley screwdriver with cushion grip handles for comfort and ease of use. Blades are chrome vanadium with precision profiled magnetised tips for lasting efficiency. 100mm with #1 point. Can be used as a Gear pusher or as a Spanner for M3 nuts.

DESOLDER BRAID 3mm

(Code: SOLBRAID) Price: \$5.95



De-solder wick. High quality Goot brand Gootwick, made in Japan.- Contains wash- free RMA flux and conforms to MIL- F- 14256F.- Supplied in plastic reels.- 1.5 metres long.

SOLDER TUBE - 0.71MM

(Code: SOLDTUBE) Price: \$1.95

60/40 resin cored 0.71mm x 15g tube.



DID YOU KNOW?

The first concepts of **video conferencing** were developed in the **1870s**, as part of an extension of audio devices. The first actual developments of the **video** telephone began in the late **1920s** with the AT&T company Bell Labs and John Logie Baird. AT&T experimented with **video** phones in 1927. Inventor **Doug Englebart's** groundbreaking research in **1968** produced the first fully integrated two-way computer and video teleconference.

<https://www.bmmagazine.co.uk/tech/history-video-conferencing/>

<https://www.eweek.com/pc-hardware/doug-englebart-inventor-of-mouse-and-teleconferencing-dies>



This Month's Q&A Technology Tips: Open and Closed Loop Systems

Q: What is a system?

A: Generally when we talk about **systems and control** within Technology we mean products and devices that will control something without help from people. In other words, the systems work **AUTOMATICALLY**. A system consists of components that are connected together to perform a useful task. An example of a purely electrical system is an amplifier; which only controls an electrical signal, it has no mechanical parts. A clock with a wind up motor, is a mechanical system, it has no electrical components. Most systems are made up of electronic components, which work together with mechanical parts. Such a system is called an integrated system.

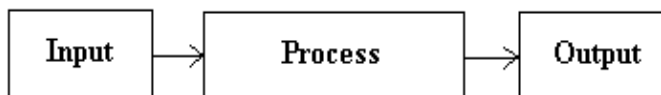
All systems have an **input, process and output**.

INPUTS are the raw elements of a system. They include things such as energy, waveforms, materials and data.

The **PROCESS** is how the input is changed to achieve its desired purpose.

The **OUTPUT** is what is produced by the process. Usually this involves the conversion of one type of energy to another.

A stereo system could use a CD player as its **INPUT**. The amplifier then **PROCESSES** the signal from the CD player. The signal is then sent to a loudspeaker, which produces sound as its **OUTPUT**.

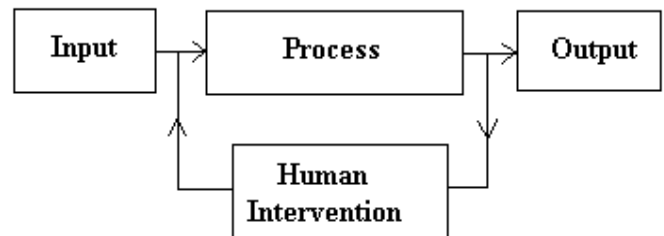


OPEN AND CLOSED LOOP SYSTEMS

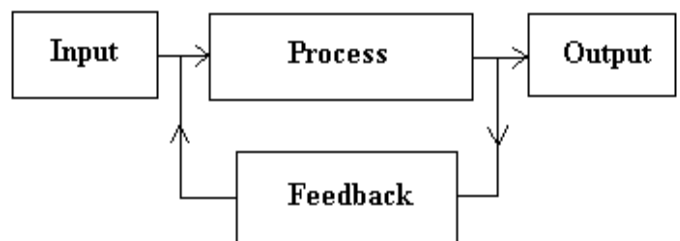
Q: What is an Open loop system?

A: An **OPEN LOOP SYSTEM** cannot control its own output since it has no feedback loop between the output and input. It cannot pass information back to the input. The stereo system is an example of an open loop system. Once the volume is set it will remain at that volume. Open loop systems require human intervention. The person listening to the stereo system monitors the output and adjusts the volume to suit their tastes.

Q: What is a Closed loop system?



A: A CLOSED LOOP SYSTEM can control its own output because it has a **FEEDBACK LOOP** between the output and input. It uses this to pass information back to the input that will affect the output. A **CLOSED LOOP SYSTEM** checks its output and is able to run independently. An automatic kettle uses a sensor to monitor the water temperature. If the water isn't boiling the heater element turns on. Once the water boils, the sensor activates a switch that turns the element off. Here the sensor provides the feedback to the switch, forming a closed loop system.



STUDENT TASK:

List 10 examples of systems used in your home. Indicate whether they are open or closed loop systems.



School of the Air



An Australian innovation the School of the Air was the first correspondence school developed for distance education that used a combination of traditional correspondence teaching methods complimented by cutting edge technology.

The problem of a quality education for outback or isolated students was difficult. Originally most were home-schooled but in 1950 new technology made distance learning feasible.

The Royal Flying Doctor service had begun operations. It used the new Pedal wireless radio transmitter and receivers developed by Alfred Traeger. Outback homesteads were installing this system so communication was possible.

Alfred Traeger suggested to Adelaide Miethke (*photo left*), the head of the South Australia branch of the Royal Flying Doctor's service, to use the radio network to broadcast lessons to school children. The first lessons broadcast taking place in Alice Springs in 1951.



**“Who
questions
much,
shall learn
much, and
retain
much”.**

Francis Bacon (1561-1626)
Philosopher, Scientist, Author

Initially, lessons were offered and students listened in without giving feedback. Teachers would sit at a radio transceiver and talk to students one at a time about lessons that had been sent to them by mail. The rest of the 'class' listened in. Later interactive lessons were introduced.

Education experiences included activities such as reading, cooking, fishing, poetry, and music. Parents and other groups could conduct meetings over the air on the well-being of the children.

Each student has direct contact with a teacher in an inland town such as Broken Hill, Alice Springs or Meekatharra. Each student typically spent one hour per day receiving group or individual lessons from the teacher, and the rest of the day working through the assigned materials with a parent, older sibling or a hired home-stay tutor.

Originally, the students received their course materials and returned their written work and projects to their hub centre using either the Royal Flying Doctor Service or post office services. Today the internet allows faster exchange of classwork and communication..

The School of the Air allows children in isolated areas to socialise with their peers. The school organises gatherings 3 or 4 times a year where the children travel to the school and spend a week together with their teacher and class.



Early days of the School of the Air.

As technology improved and advanced the School of the Air changed its use of technology. School classes were conducted via shortwave radio from 2003 until 2009, after which most schools switched to wireless internet technologies to deliver lessons that include live one-way video feeds and clear two-way audio. Today it uses the internet to provide lessons. Students are required to sit for NAP-LAN tests.

Today, new technologies such as satellites, computers, fax and email have been introduced to improve communication between students and teachers. The School currently uses a programme “Centra” which is an interactive whiteboard with a text-chat function. Teleconferencing is often used with this programme due to sound lag. Other programmes such as Moodle and Skype are also used.

Experts from the School of the Air have advised other countries on distance education.



1973 Teacher presenting a lesson



2000 School of the Air visited by Her Majesty Queen Elizabeth II.

Saving the School of the Air

It is expensive to run the School of the Air so in 2017 the government decided to close it. This decision received a huge outcry stating the adverse effects closure would have on the education of remote Australian students. The School of the Air was saved.

Professor Duncan Bentley sums up online learning “*Australia has some of the most remote communities in the world. We have met the learning challenges for these communities using ingenuity, commitment to quality and online delivery.*”

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- Professor Duncan Bentley, Deputy Vice-Chancellor (Academic) at Swinburne University of Technology.
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- R2657 Learning with the School of the Air in 1951 <http://tlf.dlr.det.nsw.edu.au/learningobjects/Content/R11942/object/r2657.html>
- #EdWeek19 - School of the Air <https://www.youtube.com/watch?v=krci8b3qH0I>