

PENREACH STEAM COMMUNITY OF PRACTICE MEETING: OVERVIEW

Date: 04-05-2021

1. PRESENTATIONS

1	Title	Addressing the “A” of STEAM
	Presenter	Kathryn Kure
	Organisation	STEAM Foundation
	Key Theme	The utility of the “A” in STEAM as an effective problem-solving technique.
2	Title	Penreach STEAM Vision and Journey
	Presenters	Susanna Oosthuizen and Cheryl Williams
	Organisation	Penreach
	Key Theme	Penreach’s STEAM vision and journey, in the context of the Penreach Shalamuka STEAM Centre.

All presentations can be accessed through the links given in these Meeting Highlights.

2. MAIN DISCUSSION POINTS FROM PARTICIPANTS

Presentations:
<ul style="list-style-type: none"> Using the arts to tackle challenges in science education, by drawing on key learnings from advertising research. Advertising is essentially about unstructured learning. The Centre rests on the pillars of the “four Cs” of 21st century learning: creativity, critical thinking, communication and collaboration, and is designed to be a space for learners to self-direct their learning. The introduction of the STEAM CoP is one way to build towards a shared vision, while collaborating.
Issues/Concerns:
<ul style="list-style-type: none"> For the “A” in STEAM to be taken up as a viable approach, we need to think about it more as a pedagogical approach, than as extra content. STEAM is an add-in not an add-on.
CoP Activities/ Reflections
<ul style="list-style-type: none"> The CoP undertook a Mentimeter exercise to reflect on the actors and modifications required to help drive STEAM in schools.
Useful Resources shared:
<ul style="list-style-type: none"> Computer Science Unplugged: https://csunplugged.org/en/ SA School Coding: https://schoolcoding.co.za/contact-us/ Lasec Education: https://www.lasec.com/education.html

3. ANNOUNCEMENTS/ EVENTS

- Penreach Shalamuka STEAM Centre launch mid-May.



WELCOME

The CoP facilitator, Craig Johnson, introduced the Penreach STEAM CoP, and welcomed participants to the first meeting through a brief check-in exercise on STEAM perceptions and experiences. Participants were asked to weigh their experiences with STEM subjects and arts subjects and visually represent that through either a thumbs-up or a thumbs-down, to depict their attitudes and inclinations towards the subjects.



Figure 1: CoP participants during the check-in exercise

ADDRESSING THE “A” OF STEAM – KATHRYN KURE, STEAM FOUNDATION

Overview of presentation

Kathryn Kure, Chief Executive Officer of the STEAM Foundation in South Africa, presented an overview of the importance of STEAM in South Africa, with a specific focus on the “A” (for arts) in STEAM. The STEAM Foundation was founded three years ago, as result of seed funding that focused on both the sciences and the arts. The Foundation’s main focus is on training educators in the STEAM disciplines, using discovery-based learning.

The “A” of problem solving

In response to challenges such as over-crowded classes, under-resourced schools, lack of scientific equipment and little hands-on experimentation, Kathryn made the case for the

utility of the “A” in STEAM as an effective problem-solving technique, when explored through the following:

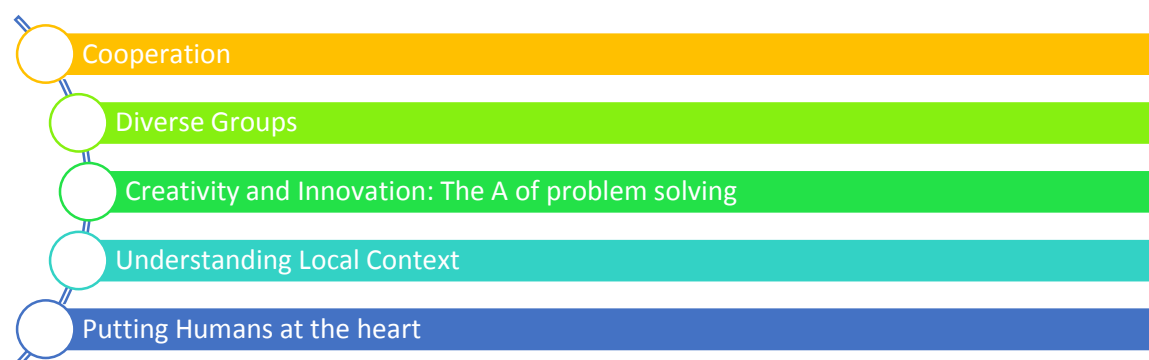
- Cooperative learning environments
- Scaffolded learning – terminology – language (English as a Second Language)
- Inquiry-based, hands-on and minds-on practical learning
- Human-Centred Design Thinking as an approach

Kathryn highlighted the importance of the arts in tackling challenges in science education, by drawing on key learnings from advertising research. Advertising is essentially about unstructured learning. Research shows that effective advertising trends, especially in print media, rest heavily on captivating colours, material size, and audiences frequently interacting with the adverts. In the same breath, research also shows that what outperforms these trends is creativity and innovation – a key feature of “arts thinking”.

Not only could the integration of the arts help the sector grapple more meaningfully with questions around how to get learners to learn without the paraphernalia of the classroom environment, it could also challenge educators to explore arts thinking” as a pedagogical approach and not just as more content. In other words, “the arts are not an add-on, but an add-in”.

The “A” in 4IR

Kathryn explained how the misconceptions that people hold about 4IR and its possibilities often keep them from being able to see how “arts thinking” is embedded in 4IR. To this point, Kathryn argued that 4IR leans heavily on soft skills, such as those listed below.



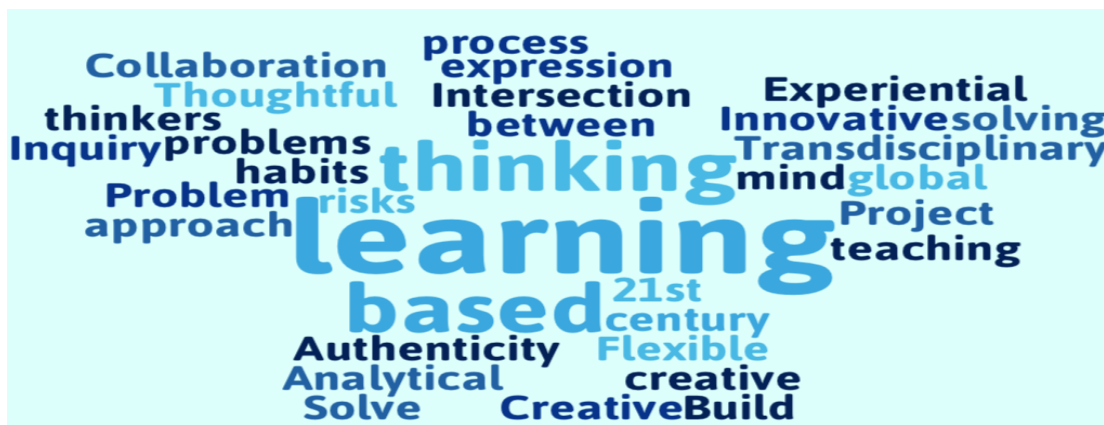
Human-Centred Design – Impact

Kathryn concluded by taking the CoP through a Human-Centred Design approach as the vehicle through which “arts thinking” can be actualised. By putting humans at the centre, this approach opens

PENREACH STEAM VISION AND JOURNEY – SUSANNA OOSTHUIZEN AND CHERYL WILLIAMS, PENREACH

Next, Susanna Oosthuizen and Cheryl Williams from Penreach presented on Penreach's STEAM vision and journey, in the context of the Penreach Shalamuka STEAM Centre. Developed in 2019, the STEAM Centre was informed by the importance of recognising the value of STEAM-based learning for 21st century learning. In the initial phases of developing this vision, Penreach knew four things:

- The Penreach Shalamuka STEAM Centre is a hub for STEAM-based learning in Mpumalanga, to be launched in mid-May in the form of a makerspace. The Centre has both a strong community-based and a centred-based ethos; these enable Penreach to develop the capacity of educators, parents, learners and leaders to use project-based learning to solve complex problems.



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Reflecting on this journey, Cheryl shared that the development of the Penreach Shalamuka STEAM Centre was phased. To this end, Phase One was geared more towards conducting research and building the space to accommodate and drive the learning approach and outcomes of STEAM. The Centre rests on the pillars of the “four Cs” of 21st century learning: creativity, critical thinking, communication and collaboration, and is designed to be a space for learners to self-direct their learning.



Figure 3: Penreach Shalamuka STEAM Centre Makerspace

DISCUSSION

CoP facilitator, Craig Johnson, invited participants to discuss their approaches to STEAM. The following is a summary of the discussion points:

- SA School Coding is a service provider that trains teachers and provides coding and robotics materials to schools. SA School Coding was involved in the process of drafting the coding and robotics curriculum. To this end, they have developed workbooks with an emphasis on developing digital skills and coding for learners in Grade R- Grade 9, using “tech-less robotics”. This STEAM approach focuses on coding principles and skills for under-resourced schools. For more information, visit: <https://schoolcoding.co.za/contact-us/>

- Lasec Education's contribution to the development of STEAM is built on collaboration with schools, departments of education, corporates and non-profit organisations to build classroom laboratory solutions for STEAM learning. More details are available on the following link: <https://www.lasec.com/education.html>
- Caroline shared, from a teacher's perspective, the importance of integrated thinking, stating that it is important to move beyond a siloed approach to teaching and to encourage generalist thinking that allows learners to explore, enjoy and experiment with more than one subject.



Overview of CoP Purpose and Structure and the way forward

While Penreach recognises the amount of work that different organisations are already doing in the thinking and application of STEAM, the introduction of the STEAM CoP is one way to build towards a shared vision, while collaborating; learning from each other; advocating for more support; promoting STEAM as a credible pedagogy; identifying shared challenges and developing and sharing best practice. The initial purpose of the CoP is summarised in the image below:

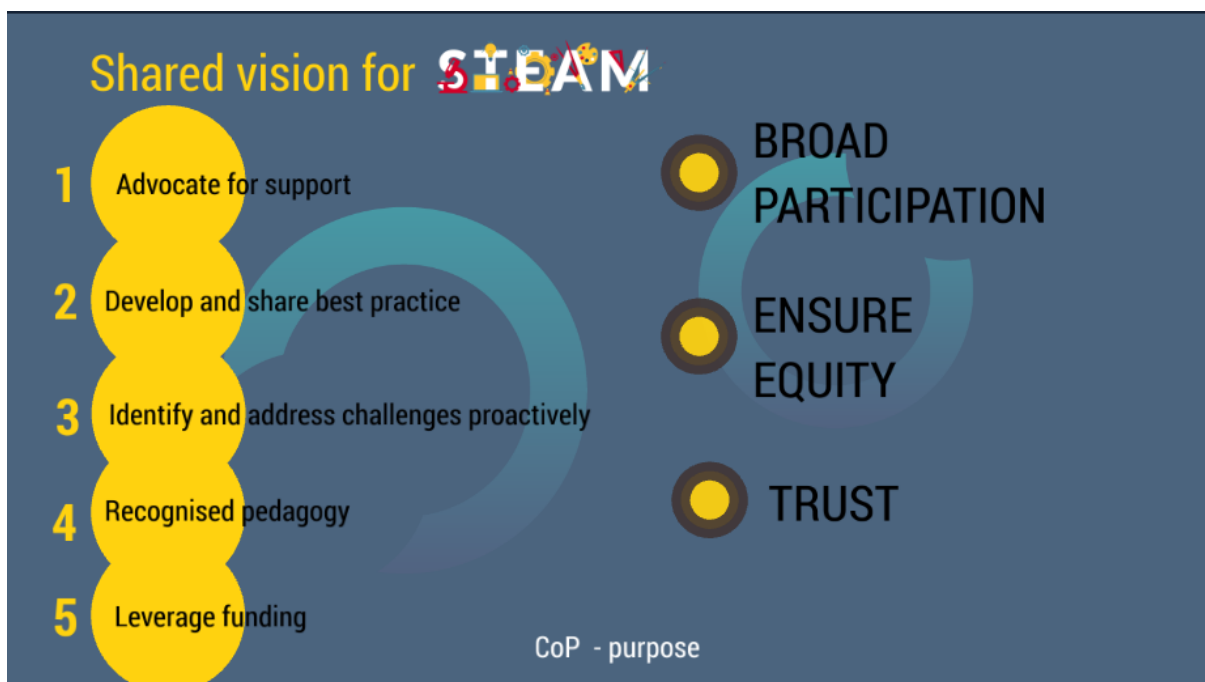


Figure 4: CoP Vision and Purpose

The CoP deliberated on the following questions, through a Mentimeter exercise:

- Who is best positioned to drive STEAM in a school setting?
- What should the role of government be around STEAM learning implementation?
- What sort of modifications, if any, to daily schedules would be required to accommodate STEAM learning?

- What value do the arts bring to STEM?

Participants had the following to say:

<p>Actors best positioned to drive STEAM in the school setting:</p> <ul style="list-style-type: none"> • STEAM Champions because they bring enthusiasm • People who are passionate about STEAM in the school setting • Passionate teachers with a willingness to learn • Learners, once they have been exposed • Principal, SMT, HoDs and or STEAM Champions • Teacher change agents who can facilitate cross-subject discussion and idea sharing rather than forced integration • STEAM Committee consisting of parents, teachers and learners 	<p>The role of government in STEAM learning:</p> <ul style="list-style-type: none"> • Government should impose less restrictions to curriculum implementation so that teachers can be more creative • Allocation of in-service training and resources • Clear and frequent communication with all stakeholders involved • Have knowledge of integrated learning • Streamline DBE red tape and administration to give teachers more time to create lessons • Recognise STEAM as an approach to teaching and learning • Get actively involved.
<p>Ideas of daily modifications required to accommodate STEAM learning:</p> <ul style="list-style-type: none"> • Integrated learning • Project based learning • Evidence based approaches • Emphasizing the importance of creativity and technology • Introduce a STEAM club as an extramural activity 	<p>The value of the arts in STEAM:</p> <ul style="list-style-type: none"> • Innovation • Creativity • Design thinking • It allows for conceptual and critical thinking which leads exploration and integration • It allows learners who assume themselves to be non-academic to realise how integrated all the subjects are • More confidence in learners who are art inclined. • Brings fun and the human element • Allows for free thinking



Close

The CoP is reminded of BRIDGE's knowledge management role. All meetings, presentations and discussions are captured and shared on BRIDGE's Knowledge Hub. To view the presentations, click [Kathryn Kure](#) and [Penreach](#)

ATTENDANCE REGISTER

Name	Organisation	Name	Organisation
Adelle Naidoo		Governor Moyana	GTT
Akani Nkansi	BRIDGE	Jarred Parenzee	Small World School, Johannesburg
Anam Ndamase	Global Teacher's institution	Jenn Coles	The Philile Foundation
Andile Ncontsa	Penreach	Johanri de Jager	Penreach
Benita Botha	Hatfield Christian School - Pretoria	Kathryn Kure	STEAM Foundation NPC
Benter Okelo	BRIDGE	Leneé Stapelberg	Penryn College
Bhongo Mkonto	GTI	Miriam Mokhele	Gauteng Department of Education
Bongo Mkonto		Nicci Hayes	Centre for Social Development
Brilliant Nxumalo	GTI	Nkhenso Mnisi	Global teachers institute
Caitlin Sidebottom	The Philile Foundation	Patience Voller	BRIDGE
Carol Annandale	Lasec Education	Phidelia Erasmus	Global Teachers Institute
Carol Harington	ELRU	Prudence Siweya	Penreach NPC
Caroline	Change Story	Sally Wakefield	Penryn Prep
Cheryl Williams	Penreach	Shabaan Khan	Affinity Educational Consultants
Christine Boxall	ADET	Simon Comfort Mohlala	Global teachers institute
Colleen Walter	Safe and Sound Learning Assoication	Sivani Naidoo	Penryn Preparatory
Courtney November	Global Teachers Institute	sobahle motau	penreach
Craig Johnson	PVT	Sphiwe Mashinini	Global Teachers Institute
David Mhlongo	District	Susanna Oosthuizen	Penreach
Deirdre Watson	Opti-Baby & Kids	Thandeka Rantsi	BRIDGE
Delight Ntimama		Thandiwe Nyembe	Global teachers institute
Ethan Festers	Global Teachers Institute	Thatohatsi Huis	Student
Given Mashabane	Penreach	Van Rooyen	AON
Gordon Sekano	NWU	Virginia Mashiane	BRIDGE
		Vuyiswa Ncontsa	BRIDGE