SFU SIMON FRASER UNIVERSITY ENGAGING THE WORLD

> Bridging Plurilingual Education, Language Awareness, and Sciences for early learners. *From Theory to Practice*

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Plurilingual and Intercultural Education aims to conceptualize translanguaging

as a pedagogical tool to create transformative learning environments designed to **harness cultural and linguistic diversity** not as a problem but as a **vital resource** to develop **literacy** and **disciplinary knowledge** (Beacco & Byram, 2007; Castellotti & Moore, 2010; Cummins, 2009; Garcia, Barlett & Kleifgen, 2007) The use of multimodal technologies, translanguaging and plurilingual interactions open up new configurations of transformative language practices, and new spaces for colearning (García & Wei, 2014) and empowerment

Embedded in educational research that studies the rich potential of **valuing plurilingualism** as an

asset, and the importance of tapping into students' experiences and mobile resources in and outside the classroom as triggers for learning.

From a global perspective, education systems must now embrace physical and virtual worlds, formal and informal settings, and personal and academic environments.

(Ciussi & Gebers Freitas, 2012, p. iv)



Multiple partnerships to create transformative CLIL learning environments designed to harness cultural and linguistic diversity not as a problem but as a vital resource to develop pluri-/multiliteracies (Cummins, 2009; Garcia, Barlett & Kleifgen, 2007) and science knowledge. Connecting Families-School-Communities

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> > 2012, p. iv)



Capitalizing on Learners' Experiences and Mobile Resources

Study supports previous research that demonstrates the richness of valuing **plurilingualism as an** *asset* (Schechter & Cummins, 2003),

and the importance of tapping into **Learners' Experiences and Mobile Resources** in and outside the classroom as **triggers for learning**.

(Corpus Litalien, 1st and 2nd graders, 2013-2014)

Translanguaging for Learning. Key Principles.

(Cummins, 2009; Cenoz & Gorter, 2015; García & Wei, 2015; Grommes, & Hu, 2014; Moore & Gajo, 2009; Ntelioglou, Fannin, Montanera & Cummins, 2014)

. Students learn more effectively when they go draw from their entire repertoire and *funds of knowledge* (Gonzalez et al., 2005) and are active **participants** in their own learning

. Participation is achieved when concepts and procedures are introduced through an investigative approach and are connected to students' *prior knowledge* in meaningful ways

. **Bi-plurilingualism** is a tool and an **asset** for knowledge construction

. Plurilingual Interaction creates a **favorable framework** and brings in new tools for the *construction* and *problematization* of **knowledge**

Plurilingual education acknowledges plurality of population, cultural references, knowledge and know-how, values and principles, as well as visions and goals of different actors within education settings. (Coste, 2014 in Grommes & Hu).

The task of the school is to secure a **gradual extension** of the learners' initial knowledges and [plurilingual] repertoires, and to establish bridges between their first repertoire and other [content/languages] areas (Coste, 2014, p. 30)

Natural embedding of **knowledge** in language diversity

Plurilingual Interactions as *safe-houses* (Garcia, 2011; Garcia & Wei, 2015) **to push learning** Targets the study of the inter-relations of plurilingual interactions and learning in multilingual and multicultural environments, to inform language policy and to design educational intervention to prepare learners and teachers to live in linguistically and culturally diverse societies



A double perspective

How plurilingual learners use their multiple resources

At school/at home/ in other contexts of learning

To develop

contextualized learning scenarios using multilingual approaches



Our study reports on a collaborative research project articulating the development of scientific and multilingual literacies, and Indigenous art in a science centre, using iPads as a learning tool for young multilingual children in Vancouver (Canada).

Learning in a museum environment

A **museum-based research** on the implementation of a multilingual literacy approach as part of the museum educational programs for early learners

The aim of this experimentation was dual: to teach new science content and provide children with language and (multi) literacy practice

The lessons intend to provide learners with authentic learning settings, *hands-on experiences* and multilingual dialogues to scaffold language learning and <u>content knowledge</u>.

Plurilingualism Art Science Technologies Education Literacies



Pastel in a science center

Collaborative, interdisciplinary and experiential learning (STEAM) Co-Development of multilingual experiential scientific activities with esthetic components and *imagination*

In the **development** , And **conceptualisation** of scientific knowledge and multilingual literacies The contextualisation of learning, Linking families-schools and the social environment.



Participants

5-8 year old children who attended activity-based science workshops at SW and the Vancouver Aquarium and collaboratively created digital science books using an iPad to document and illustrate their learning

YEAR 1- Animals, how they move, and their *footprints*.

YEAR 2 – Structures

YEAR 3 – Light and Shadows

Our focus throughout the research was to encourage children's access to multiple languages as resources to support their engagement in science literacy practices.



The remaining 101 multilingual children in the sample had spoken competencies in a language such as: Spanish, French, German, Hindi, Punjabi, Arabic, Indonesian, Farsi, Telugu, Romanian, Vietnamese, Russian, Malay, Serbian, Kurdish.



The co-developed *Budding Scientists* program aims to give young learners opportunities to develop **science literacy** in a science centre setting. It also encourages children to actively work with, reflect upon or produce different languages they know or that are present in their environment (Chinese, French, Japanese, Spanish, etc.) to **construct science knowledge**.

Multilingual/multicultural pedagogical scenarios for science learning

Team members jointly planned interactive activities in environmental science and biology, technology and social sciences using (Indigenous) art and stories (Raven stole the

SUN) and **cross-curricular topics** (Langer & Neumann, 2012), using a multisensory learning approach (Do, Touch, See, Listen, Speak) and **multiple languages**;

Activities targeted a wide breadth and scope of learning through: games, experiments, interacting with objects (like mirrors, magnifying glasses, torches, microscopes) to provoke complex cognition;

Use of clip-boards and iPads to record ideas and observations.



Light Play allows learners to play, explore and make discoveries with light. They learn how it bends, bounces and blends with the help of lenses and mirrors; along with color-combining and shadow play. Learners investigate what happens to light when it encounters various materials, allowing them to experience scientific concepts through light play. The result brings to life the science of light through the creation of shadow puppets and digital learning books.



The activities focus on our human connection to nature, science and technology through diverse worldviews, including Indigenous.

Collaboration with science-centers educators, language educators, in the development of the activities, learners explore science through art, stories, and social practice.







Aesthetic literacy experience & science conceptualisation

Use of various languages and writing systems within the science activities

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In relation with the local culture (such as the Chinese characters for the Year of the Rooster) And the science learning objectives

And as both an **aesthetic literacy experience** And a support for science **conceptualisation**





Our findings illustrate the many ways Integrating Multilingual Literacies, story telling and art, and Content Knowledge at a Science Centre

can create transformative learning environments designed to harness cultural and linguistic diversity not as a problem but as a vital resource to develop literacy and disciplinary knowledge (Cenoz & Gorter, 2015; Conteh & Meier, 2015)

Integrating languages cultures and content

Respect for, and revalorisation of, local knowledge and *Multiperspectivity* Contextualization of learning Connecting Schools – Families – Communities

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MOORE, D., HOSKYN, M. & MAYO, J. (2018). Thinking Language Awareness at a Science Centre: Ipads, science and early literacy development with multilingual, kindergarten children in Canada. *International Journal of Bias, Identity and Diversities in Education (IJBIDE), 3(1),* 40-63. DOI: 10.4018/IJBIDE.2018010104.



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