NEWS and VIEWS

Indigenous Science Knowledge Research Interest Group (ISK-RIG) created by NARST
We are pleased to announce the creation of the Indigenous Science Knowledge Research Interest Group [ISK-RIG], approved by the NARST Board of Directors at the 2017 Annual International Conference in San Antonio. During the 2016 conference in Baltimore, an informal group of interested members came together to discuss the need to form a RIG given the growing number of NARST researchers who are themselves Indigenous and/or working alongside Indigenous communities. This group includes active members from Africa and the African Diaspora, Alaska, Australia, Canada, Indigenous populations of the Americas, Asia and the Pacific, the Middle East, Thailand, Nordic Regions, New Zealand, Scandinavia, the West and East Indies, etc. The purpose of the ISK-RIG is to support current and future research agendas regarding Indigenous Science Knowledge/Education. We invite interested NARST members to contact Femi Otulaja (fso2000@nyu.edu or femi.otulaja@wits.ac.za ) to join (and learn more about) the RIG.

Living Water
Aboriginal people have been managing water for thousands of years on the driest continent on earth. But what's the future for this most precious resource? Jane Ulman gathered stories from all over the continent and finds a common thread.
http://www.abc.net.au/radio-national/program/awaye/living-water/8717336

Indigenous Mathematising in School Mathematics
Glen Aikenhead, Canada

In the upper years of school science, mathematics plays an important role in deciding who graduates and who does not. As far as I know, there is no equivalent to Indigenous Science Network Bulletin in mathematics education. Because science teachers are often assigned mathematics courses to teach, news of Indigenous cross-cultural mathematics education in lower and upper secondary education may interest readers who follow ISNB.

A policy paper, “Enhancing School Mathematics Culturally: A Path of Reconciliation” (Aikenhead, 2017), discusses relevant research and developments toward including Indigenous mathematising in school mathematics by collaborating with Indigenous Elders and communities. The paper also critiques the innovative work that has been accomplished, such as D’Ambrosio’s ethnomathematics.

Although mathematics innovators have made significant contributions by showing that both Indigenous and non-Indigenous students’ achievement increases dramatically and noticeably (respectively) in cross-cultural
school mathematics, the innovators do not go far enough to accommodate Indigenous worldviews. Educators seem to be trapped in a 19th century conceptualization of school mathematics that continually marginalizes Indigenous students. Most importantly, therefore, the innovators have not challenged their systemically racist mathematics curriculum by proposing a curriculum that meets 21st century realities, which include an era of reconciliation. A colonial mentality subtly but effectively endures in curricula and classrooms every day.

In the Province of Saskatchewan, Canada, however, a group of mathematics educators have formed a group committed to challenging 19th century myths about school mathematics. We are developing illustrated specifications for a renewed school mathematics, consistent with Canada’s era of reconciliation, designed according to proven mathematics education practices, and informed by the culture-based renewal of the school science program in 2008-2014 (Aikenhead & Elliott, 2010).

The group, Revisioning Reclaiming Reconciling School Mathematics, is just beginning to embark upon research and development program for culture-based school mathematics. We define “culture-based” as comprised of four cultural components:
1. traditional and contemporary Indigenous mathematising found in local Indigenous communities, which can be interpreted as analogous to certain Western mathematics content. Therefore, these examples of Indigenous mathematising can be learned by students and can be translated into conventional (Euro-American) mathematics content in order to teach in mathematics classes, in non-appropriating and non-tokenistic ways, for the benefit of all students;
2. the culture of conventional (Euro-American) mathematics: its ideologies, values, presuppositions, and history;
3. everyday practices in the lives of citizens and in occupations and professions that explicitly or implicitly involve either conventional mathematics content or analogues of it (i.e., math-in-use);
4. powerful explicit or implicit influences of conventional (Euro-American) mathematics content on society, for which there are political, economic, social and ethical consequences, both positive and negative (i.e., math-in-action).

We recognize the importance, on the one hand, of school mathematics for adult numeracy, defined by the mathematising woven into home life, the community, and non-STEM workplaces; and on the other hand, pre-professional training for post-secondary STEM programs. Developing a flexible and porous boundary between these two pathways through upper secondary school is our target. Curriculum development must go hand-in-hand with its implementation to maximize the upscaling from local successes.

References

Bridging Cultures Over-Under: Creating Liminal Spaces of Possibility
Michelle Hogue & Joanne Forrest
As educators of Indigenous university students on opposing sides of the globe, we, Michelle Hogue of the University of Lethbridge (U of L) and Joanne Forrest of Batchelor Institute (BIITE), developed a collaborative pilot project Bridging Cultures Over-Under. During Michelle’s visit to Darwin, Australia in 2016, we learned our programs were similar in nature in that they are transition programs intended to provide a solid foundation of courses and skills for Indigenous students who have been away from academics for some time or who might not have the full qualifications necessary to enter directly into the post-secondary degree of their choice. We were fascinated by our similar experiences given the polarity of our locations and felt there was much, we as educators, and our students could learn from each other. This initiated the building of relationships between the two programs through classroom Skype sessions. The aim of this beginning collaboration is to share our knowledge, experience and resources and find ways of working effectively to best support Indigenous students in their preparation for university. As importantly, we want our students to connect and develop relationships so that they might share their own experiences and learn from and support each other. With the increasing demographic of Indigenous students entering into post-secondary education (PSE), it is critical that we build culturally responsive bridges to university that build capacity and enable their success in the Western system.

Michelle is an educator and scholar of Indigenous heritage while Joanne is a non-Indigenous Australian educator. Both work in similar domains. The basis of this unique professional relationship and friendship is the foundation for an ongoing collaboration between the two institutes to investigate how we might reframe ideological standpoints to navigate, shape and implement methodological approaches that best support Indigenous student learning from a Two-Eyed Seeing, (Bartlett, 2017; Bartlett, Marshall & Marshall, 2012) or Both Ways Knowing (Ober & Bat, 2007) perspective. Outcomes will provide information and materials for both Indigenous and non-Indigenous educators and researchers investigating best practices for engaging, enabling and retaining Indigenous students in PSE. Importantly, in the process of connecting students, our goal is to establish a safe on-line space where they may stay connected and continue to share and learn from each other should they wish to continue their conversations.

What I really liked about skyping with the students in Australia is that it made it so real; skyping really brought them to life. At first it was a bit scary because they were up on a screen and seemed larger than life and it was sort of weird to be talking to a screen but once we started talking it was so cool because it was like we could have a real conversation. I learned so much and wish we could have done this for the whole year. It was way better than reading about their culture in a book that is for sure. We got to hear their stories in the real. (FNTP student, 2017)

Yesterday’s communication with the First Nations students of Canada would have to be the highlight of this block for me. Hearing about their visions for the future was not only interesting but also inspiring. Learning what a ‘reserve’ is was a shock for me and made me more inquisitive about Canadian First Nations People. The interaction between me and fellow students was also something that has made me feel more relaxed and comfortable, being able to relate to them (even thought we were all nervous at the beginning). Also learning about them and where they come from was something that I believe has helped all of us. Sadly our stories of assimilation are similar. (PTS student, 2017)

---

1 Associate Professor & Coordinator First Nations’ Transition Program; Lethbridge, Alberta, Canada
2 Lecturer, Preparation for Tertiary Success program; Darwin, Northern Territory, Australia
Aboriginal & Torres Strait Islander Mathematics Alliance


It is jointly organized by Professors Nalini Joshi (Maths, Sydney University) and Mahananda Dasgupta (Physics, ANU) through their Georgina Sweet Australian Laureate Fellowships. Applications are invited from women and diverse gender researchers with a PhD in mathematical or physical sciences, who are within 7 years after the award of their PhD.

Up to 35 successful applicants will receive financial support for airfare and accommodation costs to attend the workshop. Applications are due 13 August. Please circulate to anyone who may be interested.

Click for further information: MAGIC17%20pack.pdf

Visit Aboriginal & Torres Strait Islander Mathematics Alliance at: http://atsimanational.ning.com/?xg_source=msg_mes_network

Congratulations

We would like to congratulate Angela Kolonich who graduated with her Ph.D. this May in Science education from Michigan State University. She is Métis and originally from Winnipeg, Manitoba. Her research is in equity-focused science teacher professional development.

“I accepted a Post-doc position at Michigan State to continue my research work which I will start in the fall. I am really excited about participating with the IKS-RIG.

“I am including a graduation picture. In the picture, I am wearing a pendleton stole that was gifted to me at the Native MSU graduation ceremony.”
The essays in this volume contain a symphony of carefully orchestrated narratives that engage a wide-ranging assemblage of topics including immigration, indigenous identity, Genízaros, hybridity, education, religious syncretism, and United States and Spanish imperialism. Utilizing excavated memory, archival history, and employing the work of performance and postcolonial theorists, the author examines Native American slavery and captivity in the Spanish Colonial Southwest, with emphasis on Coyotes (indigenous mixed-bloods) of Pueblo/Spanish ancestry as well as descendants of Indigenous servants. The essays engage the cultural politics of education within the context of hybrid religious practices such as pilgrimages to el Cerro de Tepeyac, the site of veneration of the pre-Columbian Goddess Tonanzin and her contemporary, la Señora de Guadalupe; el Santuario de Chimayo, the pre-Hispanic Tewa religious site that continues to serve as the destination for pilgrims, albeit now draped in Catholic ritual; and the Comanche dance ceremony of the Saracino sisters of Atrisco. The essays emerge in part from the author’s childhood in the Barelas and Atrisco neighborhoods of Albuquerque, two of several mixed-blood indigenous communities of New Mexico plagued by a devastating heroin epidemic in the 1950s and 60s. 

Realising Innovative Partnerships in Educational Research: Theories and Methodologies for Collaboration


Realising Innovative Partnerships in Educational Research examines the underlying principles and actions that support the development of and engagement in partnerships in educational research. With social justice at its core, the work in this book represents various architectures of innovation, whereby new ways of thinking about partnership research are proposed and practices of teaching and learning are reconciled (or not) with existing education contexts and practices.

With contributions from educational researchers and practitioners from New Zealand, and international commentaries provided by established scholars in the field, the book draws together key experiences and insights from students, teachers, community members and researchers in tertiary, community, school, and early childhood settings.

The research in this book seeks to address a gap in our understanding, extending knowledge beyond simply the benefits of partnership work, to examine how successful partnerships can be initiated, enacted, and sustained over time. This book invites reflection on the following provocations: Why engage in partnerships for educational research? How has this happened in the past and what needs to happen for the future? What is unique about the New Zealand context and what might researchers in other countries learn from our collaborative and culturally responsive research methodologies? What could be some of the underlying principles that support the development of and engagement in collaborative research? How do we evaluate the effectiveness of research partnerships in education to shift the focus to the future?

Open Theme Issue Table of Contents
http://ijme-journal.org/index.php/ijme/issue/view/42

Articles (Peer-reviewed)
Navigating the Meanings of Social Justice, Teaching for Social Justice, and Multicultural Education (1-19)
Hyunhee Cho

Beyond US-Centered Multicultural Foundations on Race (20-43)
James C. Jupp, Miryam Espinosa-Dulanto

Defining Intercultural Education for Social Cohesion in Malaysian Context (44-60)
Amrita Kaur, Rosna Awang-Hashim, Mohammad Noman

Exploring Involvement Expectations for Culturally and Linguistically Diverse Parents: What We Need to Know in Teacher Education (61-81)
Sandra M. Gonzales, Susan L. Gabel

The Same but Different: Making Meaning from Modified Texts with Cross-cultural Themes (82-99)
Cynthia B. Leung, Susan V. Bennett, AnnMarie Alberton Gunn

Being Black (and) Immigrant Students: When Race, Ethnicity, and Nativity Collide (100-130)
Chryystal A. George Mwangi, Shelvia English

Whiter Shade of Pale: Making the Case for Jewish Presence in the Multicultural Classroom (131-145)
Daniel Ian Rubin

A Novice Bilingual Teacher’s Journey: Teacher’s Noticing as a Pathway to Negotiate Contradictory Teaching Discourses (146-162)
Sandra I Musanti

Praxis Articles (Peer-reviewed)
“Into the Realm of the Politically Incorrect”: Intercultural Encounters in a Service-Learning Program (163-181)
Christelle Palpacuer-Lee, Jessie Hutchison Curtis

Long Ago and Far Away: Preservice Teachers’ (Mis)Conceptions Surrounding Racism (182-198)
Melissa Beth Wilson, Tracey Kumar

The case for urgency: advocating for indigenous voice in education

This review paper argues that improving educational outcomes for Indigenous Australians is essential to overcoming the rates of multiple disadvantage that Indigenous people endure across Australia today. How best to improve the educational outcomes is really the matter of urgency to be debated.

Section 1 identifies five key propositions in its case for urgency: the colonial and post-colonial history, the diversity of the Indigenous population, the social and economic disadvantage and the policy parameters needed for effective Indigenous education policy.

Section 2 provides and examines the key national data sets that determine the current education performance of Indigenous students across Australia. Jurisdictional and geolocational comparisons are used to investigate patterns of strength and weakness in students’ educational performance. Analyses that address the many factors related to possible explanations for the differential data are presented.

Section 3 outlines and analyses policy trajectories in Indigenous affairs, specifically in education, over the last quarter century. Links are drawn between policies, ideological positions and to global perspectives on First Nations policy.

Section 4 identifies five key and immediate challenges in the area of Indigenous education that require solutions. Educational programs, implemented with a view to meeting these challenges, are examined, in terms of their inclusiveness, strength of evidence base and outcomes achieved.
Section 5 explicitly addresses the review’s central argument: that only when there is deeper engagement by the recipients of policy is it likely that most factors relevant to success can be incorporated in its implementation. In support of this position the authors refer to the Uluru Statement of the Heart, which in May 2017 unequivocally called for Indigenous voice to be heard.

**The Life Code**

Luke Briscoe has written and produced a first of the NITV Online series The Life Code which he wanted to share with you.

“The way our ancestors passed on knowledge was through a very sophisticated code and the Yalanji word for this is Ngujakura; our Lore and it’s The Life Code of the world that we live in. Please visit: [http://www.sbs.com.au/nitv/feature/life-code-sky-full-secrets](http://www.sbs.com.au/nitv/feature/life-code-sky-full-secrets)”

**The World of Science Education: Handbook of Research in Science Education in Sub-Saharan Africa**


Each volume in the 7-volume series *The World of Science Education* reviews research in a key region of the world. These regions include North America, South and Latin America, Asia, Australia and New Zealand, Europe and Israel, North Africa and the Middle East, and Sub-Saharan Africa.

The focus of this *Handbook* is on research in science education in mostly former British colonies in Sub-Saharan Africa and the scholarship that most closely support this program. The reviews of the research situate what has been accomplished within a given field in Sub-Saharan Africa rather than an international context. The purpose therefore is to articulate and exhibit regional networks and trends that produced specific forms of science education. The thrust lies in identifying the roots of research programs and sketching trajectories – focusing the changing façade of problems and solutions within regional contexts. The approach allows readers to review what has been done and accomplished, what is missing and what might be done next.

**Recent papers**


**ABSTRACT**

Culturally responsive or place-based school mathematics that focuses on Indigenous students has an established presence in the research literature. This culture-based innovation represents a historical shift from conventional approaches to mathematics education. Moreover, it has demonstratively advanced the academic achievement for both Indigenous and non-Indigenous students.

Its success has exposed deep fault lines in conventional school mathematics. Many mathematics educators unknowingly embrace problematic, taken-for-granted notions about their school subject that inhibit student engagement and contribute to Indigenous students' low graduation rates. However, innovative researchers and teachers have adapted or developed culture-based teaching materials and strategies that significantly reduce the problems inherent in conventional school mathematics. As a result, these innovators' actions challenge standard curricula and instruction.

These changes coincide with another profound transformation taking place in countries with Indigenous citizens. In response to having kidnapped Indigenous children and held them in residential schools in an attempt to rid them of
Accordingly, this article has two main goals: to (a) **illustrate** how critical analysis can help educators decide which taken-for-granted notions about school mathematics should continue to be embraced and which ones should be updated because they interfere with the engagement and achievement of most Indigenous students and a majority of non-Indigenous students and (b) identify concrete ways in which mathematics educators, researchers, and curriculum writers can help enhance school mathematics by drawing upon how mathematics is used in both mainstream and Indigenous cultures and in a way that simultaneously promotes both academic achievement and reconciliation. These goals lead to the following questions answered in this article:

1. **What conventional taken-for-granted notions impede student achievement?**
2. **Which of these conventional notions continue to be held by many innovators who have enhanced school mathematics culturally?**
3. **Which innovative taken-for-granted notions improve student academic achievement?**
4. **Exactly how do researchers or teachers “see” school mathematics content “embedded” in an Indigenous artisan handwork or activity?**
5. **Which notions found in conventional school mathematics continue to serve students' interests?**
6. **How can mathematics curricula mitigate systemic racism and support reconciliation?**
7. **What specific actions can mathematics teachers, researchers, teacher educators, and curriculum writers take to regenerate what is essentially a Victorian-era, 19th-century elitist curriculum (for Grades 5 and higher) to a 21st-century curriculum in harmony with today's realities?**

The article advances a pluralist mathematics perspective that makes explicit the cultural nature of school mathematics within an Indigenous cross-cultural framework of respect and collaboration. Mathematics’ cultural nature becomes both a context of instruction and content expressed in a curriculum.

**INDIGENOUS ASTRONOMY**

**Dr Ragbir Bhathal**

For NAIDOC WEEK, Dr Ragbir Bhathal, Distinguished Teaching Fellow at Western Sydney University and a Visiting Fellow at the Research School for Astronomy and Astrophysics at the Australian National University, was invited to give a lecture to the Federal High Court in Sydney. The talk was televised to all the Federal High Courts in Australia. It was very well attended and the audience appreciated the talk. He fielded many questions. The title of the talk was **COOK, MABO AND THE STARS OF THE TAGAI**. For his Visiting Fellowship at the ANU, Dr Bhathal is writing a book (Mount Stromlo Astrophysicists: The Endless Frontier). The book will be about the contributions made to international astrophysics by the Research School's eminent astrophysicists who have not only made significant contributions to the frontiers of astrophysics but also opened up new fields for investigation. The book has been accepted for publication by the ANU Press.

**CONFERENCES**

**Best of Both Worlds 2017 International Conference**

5-8 November 2017
Kruger National Park, South Africa

I am reaching out to let you know about the [Best of Both Worlds (BoBW) 2017 International Conference](#) on Environmental Education, taking place from November 5 – November 8, 2017 in Kruger National Park, South Africa (think of waking up to rhinos, giraffes, elephants, and more!!!). Last year, our organization (GO3 Project) hosted BoBW 2016 in Rocky Mountain National Park (Colorado, USA) and had over 100
participants join us from all over the world. As we showed many international friends the US, the South Africans will be doing the same for all travelers this year.

The Best of Both Worlds began in 1998 in South Africa and has also been hosted in Malaysia, Brazil, and the United States. Each year, a new location based in nature is chosen for the conference. This conference is a forum for practitioners, teachers, and those involved in education and communication to meet and share experiences in strengthening the framework for environmental education and education for sustainable living.

**American Geophysical Union Fall Meeting**
11-17 December 2017
New Orleans, LA

*Session PA017: Native Science: How Indigenous Perspectives Inform Environmental Science and Policy*

Perspectives of indigenous peoples can bring deep insight to the study and management of complex environmental systems through their holistic approaches to problem solving and ways of knowing. These perspectives can inform and enrich western scientific research and discussions of policy in areas related to sustainability, human-environment interactions, ecosystems, climate adaptation, geohealth, and more. Although western science has begun to acknowledge the importance of indigenous knowledge, voices of indigenous peoples are largely absent from scholarly discourse. With this in mind, we welcome submissions focusing on indigenous voices and perspectives in environmental sciences and policy emphasizing meaningful collaborations between western scientists and indigenous communities, or on indigenous scholars’ experiences walking in both worlds. Submissions may be case studies, syntheses, or other scholarship focusing on one or more indigenous tribe, group, or organization. We also welcome perspectives discussing relevant issues surrounding community based participation, ethics, mutual understanding, and respect for sacred knowledge.

[https://agu.confex.com/agu/fm17/preliminaryview.cgi/Session26060](https://agu.confex.com/agu/fm17/preliminaryview.cgi/Session26060)

---

**CALENDAR OF EVENTS**

This is mostly a summary of upcoming conferences. More details may have been given in this or previous bulletins as shown. A web-based contact is usually included. Inclusion of conferences in this list should not to be interpreted as an endorsement of the conference.

**2017**

**August**

**October**
6-8 October: Science Education for Equity, Diversity, and Social Justice (SEEDS), San Juan, Puerto Rico
[https://sites.google.com/view/seedscconferences/2017-conference/call-for-proposals?authuser=0](https://sites.google.com/view/seedscconferences/2017-conference/call-for-proposals?authuser=0) (Dec16)

10-12 Octobre: 3e édition du Colloque sur la persévérance et la réussite scolaires chez les Premiers Peuples, Quebec, Canada [http://colloques.uqac.ca/prscpp/appel-de-propositions/](http://colloques.uqac.ca/prscpp/appel-de-propositions/) (Dec16)

**November**
[https://www.theaasiks.org/](https://www.theaasiks.org/)
5-8 November: Best of Both Worlds 2017 International Conference, Kruger National Park, South Africa. Best of Both Worlds (BoBW) 2017 International Conference (Aug17)

7-10 November: Oceania Comparative and International Education Society, Université de la Nouvelle-Calédonie, New Caledonia. OCIES.org (April17)


December

2018

March