

Etuaptmumk (Two-Eyed Seeing) in the Science Classroom

Genevieve Johner is a recent alumnus of the University of Calgary. She graduated in 2020 with a Bachelor of Science in Natural Sciences, as well as a Bachelor of Education in Secondary Education. During her undergraduate studies, Genevieve served as the Vice President of Professional Development with the Education Students' Association, where she worked to inspire a love of lifelong learning by building the strongest professional development program of any ATA Student Local in the province. Genevieve also has extensive experience in service and community-based learning through her work in the Humane Education department of the Calgary Humane Society, where she has worked as a Youth Program Leader and Summer Camp Assistant.

| Resources used and possible concerns | Author/creator and/or literature background |
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| <i>The Hands Measure: Essays Honouring Leah Askaajuq Otak's Contribution to Arctic Science</i> (Edited by John MacDonald & Nancy Wachowich) | <p>Leah Askaajuq Otak was an oral historian and linguist from Igloolik, whose essential contribution to scientific research in Nunavut inspired those who knew and worked with her. She worked at the Igloolik Research Centre, where she played a crucial role facilitating the fieldwork of visiting researchers from near and far. Her collaboration with researchers, particularly in the social sciences, together with her extensive work documenting Inuit oral histories, ensured that Inuit traditional knowledge and perspectives informed and were reflected in much of the resulting research (Amazon, 2017)</p> <p>John MacDonald is the former director of the Igloolik Research Institute and the author of <i>The Arctic Sky: Inuit Astronomy, Star Lore, and Legend</i>. (Google Books, 2018)</p> <p>Nancy Wachowich is a lecturer in Social Anthropology at University of Aberdeen, Scotland. She is the author of <i>Saqiyuq: Stories from the lives of three Inuit women</i>. (Google Books, 2018).</p> |

UPE Course Connections

EDUC 420

- Build and design a narrative which creates an interdisciplinary vision of schools and schooling, curriculum, diversity, and students.
- Critically and collaboratively reflect upon and give feedback on conceptual pedagogical frameworks

EDUC 460.17/535.17

- Develop a foundational understanding of the nature of Indigenous perspectives in the discipline, as related to two-eyed seeing
- Explore and apply introductory theory related to science education with an emphasis on creating an adaptive classroom learning environment to better meet the needs of the diverse learners in Alberta's classrooms.

Essential Question

How can we practically and respectfully incorporate two-eyed seeing in the secondary science classroom?

Synopsis

In this lesson, the students will explore and build upon their understandings of *etuaptmumk* (two-eyed seeing). They will be given an opportunity to openly and honestly discuss the potential benefits, as well as any hesitation or apprehension that they may have of incorporating these ideas into their classroom pedagogy in field experiences and following graduation. Students will then be given time to work on a proposal to implement two-eyed seeing in a fictional junior high or high school in which they are a new teacher recommending the idea to a learning leader.

Prerequisite Knowledge

Students must have read Chapter 14 (pg. 276-297) in *The Hands' Measure* and watched the Cheryl Bartlett video before participating in this lesson.

It is recommended that the students review the assignment description & rubric in the LMS before coming to class.

| Materials Needed | Plan for Differentiation/Inclusion |
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| <p>Uploads to LMS before the class:</p> <ul style="list-style-type: none"> • Electronic (PDF or other) copy of the <i>The Hands' Measure</i> Chapter 14 • URL to video • Link to collaborative Google Slide • “The Two Eyed Seeing Science Classroom Proposal” assignment description & rubric (see appendix) <p>During the class:</p> <ul style="list-style-type: none"> • Blank paper • Writing utensils/colored pencils • Notes to guide explanation/discussion of two eyed seeing • Computer with internet connection & projector • Paper copies of “The Two Eyed Seeing Science Classroom Proposal” assignment description & rubric | <ul style="list-style-type: none"> • Activities involve different learning preferences (verbal/auditory, written/visual, small and large group discussion) • Students volunteer to share if they are comfortable • Circle discussion with use of talking stick ensures that every student has an opportunity to share and be heard by others • Lesson may be run without each student having a personal computer • Deliverable for assignment can be completed a variety of ways depending on student learning preference |

| Sequence | | | |
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| Component & Time Frame | Details | Resources | Assessment |
| <p>Hook (Engage) 5 mins</p> | <p>Students will be asked to <u>draw</u> a response to the following question based on the following question: <i>After watching the video on two-eyed seeing and reading the chapter from The Hands' Measure, what does two-eyed seeing/integrative science mean to you?</i></p> | <p>Blank paper</p> <p>Colored pencils/markers</p> <p>Extra writing utensils</p> | <p>Entry drawings (formative)</p> <p>The instructor will be able to see who has completed the appropriate prerequisites for the class.</p> |
| <p>Whole-Class Discussion (Explore) 10 mins</p> | <p>The class will form into a circle. A talking stick will be passed around, and each student will share their drawing when they have the talking stick.</p> | <p>Talking stick</p> | <p>Anecdotal evidence (formative)</p> <p>The instructor will be able to see and make mental note</p> |

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| | If students do not feel comfortable sharing their drawing, they may pass the talking stick onto the next person. | | of what students have taken away from the readings before the lesson begins. |
| Direct Instruction (Explain) 10 mins | <p>The class will remain in the circle formation for this segment of the lesson.</p> <p>The instructor will explain the principles of two-eyed seeing and how it relates to integrative science. They will provide examples they have seen in the field, either as a scientist, educator, or teacher education instructor/supervisor.</p> | None required | None for this segment |
| Small Group Work (Explore) 15 mins | <p>The students will form small groups. In these groups, students will work together to create a pro and con grid responding to the following prompt: <i>From your perspectives, what are the advantages of incorporating two-eyed seeing into your junior high or high school science classrooms? What are the disadvantages?</i></p> <p>The instructor should reiterate that the students can consider the perspectives of their students, staff, parents, and other stakeholders in the school community.</p> <p>The students will record their pro and con grid into the Google Slide created by the instructor, which can be accessed using a link provided through the LMS.</p> | <p>Link to Google Slides on LMS</p> <p>Personal computers *Note: not all students have to have a personal computer, just one group member does.</p> | <p>Google Slides collaboration (formative)</p> <p>The instructor will monitor group discussions and answer questions as necessary. They will also monitor the Google Slides documents to ensure students remain on task and to identify potential misconceptions and excellent perspectives on two-eyed seeing in application</p> |

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| <p>Whole-Class Discussion (Elaborate) 10 mins</p> | <p>The class will return to their circle to discuss their ideas with the class.</p> <p>The instructor will go through the collaborative slides and allow each group an opportunity to highlight one advantage and one disadvantage from their grid to explain, including WHY they added that to their grid.</p> <p>The instructor will then re-introduce the assignment description that the students should have reviewed on the LMS before coming to class. They will pass out a paper copy of the assignment to those students who do not have access to a computer.</p> | <p>Link to Google Slides</p> <p>Paper copies of “The Two Eyed Seeing Science Classroom Proposal” assignment description & rubric</p> | <p>Anecdotal evidence (formative)</p> <p>The instructor will make mental notes of the reasoning behind the students inclusion of certain ideas on their grids, gaining insight into sources of apprehension, hesitation, and reluctance to incorporate the subject into their teaching.</p> |
| <p>Individual/Pair Work Time (Explore) 30 mins</p> | <p>The students will now have time to work on their proposals for their fictional learning leaders, as outlined in the assignment description.</p> | <p>Assignment description & rubric available on LMS</p> | <p>Anecdotal evidence (formative)</p> <p>The instructor will gather evidence of understanding by circulating around the room and observing students working/asking probing questions for those who require more direction.</p> |
| <p>Conclusion & Exit Task (Evaluate) 10 mins</p> | <p>At the end of the class, the students will complete an exit slip (either physical copy or electronically via email/LMS discussion board) using the RSQC2 format (Angelo & Cross, 1993).</p> | <p>Blank paper</p> <p>LMS forum for exit slip answers</p> | <p>RSQC2 exit slip (formative)</p> <p>The instructor will have an opportunity to compare the</p> |

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| | <ul style="list-style-type: none"> - <u>Recall</u> meaningful points from the class - <u>Summarize</u> their key takeaways - Ask a <u>question</u> they still have that did not get answered yet - <u>Connect</u> what they have learned to other courses, readings, or experiences - <u>Comment</u> on the quality of the lesson <p>The instructor will also collect the drawings that the students made at the beginning of class before the students leave.</p> | | <p>student drawings from the beginning of the class to their answers on the exit slip. They will be able to identify any conceptual changes that occurred, as well as reflect on the quality of the lesson/what improvements to make for next time.</p> |
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Additional Resources

Alberta Education. (2019). Teaching Quality Standards [PDF]. Retrieved from: <https://www.teachers.ab.ca/TheTeachingProfession/TeacherQualificationsService/Pages/AboutTQS.aspx>

Angelo, T. A., Cross, K. P. (1993). Classroom Assessment Techniques (2nd edition). San Francisco, California: Jossey-Bass Publishers.

Cheryl Bartlett. (2012). Two eyed Seeing [Video]. Retrieved from: https://www.youtube.com/watch?v=_CY-iGduw5c

Harrison, N., Greenfield, M. (2010). Relationship to place: positioning Aboriginal knowledge and perspectives in classroom pedagogies. *Critical Studies in Education*, 52(1), pp. 65-76.

Institute for Integrative Science & Health. (n. d.) Two Eyed Seeing [Website]. Retrieved from: <http://www.integrativescience.ca/Principles/TwoEyedSeeing/>

Rowley, S. (2018). Iglulingmiut Geology. In J. MacDonald & N. Wachowich (Ed.). *The Hands' Measure: Essays Honouring Leah Aksaajuq Otak's Contribution to Arctic Science* (pp. 276-297). Iqaluit, Nunavut: Nunavut Arctic College Media.

The Two-Eyed Seeing Science Classroom Proposal for Learning Leaders

Rationale

The inclusion of Indigenous ways of knowing into one's pedagogy is a legal requirement stated in Alberta Education's Teaching Quality Standards (2019, p. 6), where "a teacher must develop and apply foundational knowledge about First Nations, Métis, and Inuit (FNMI) for the benefit of all students". As you will explore throughout your Education degree, FNMI knowledge is not something that can be "packaged within a unit of work and taught out of context or away from the place it was produced" (Harrison & Greenfield, 2010, p. 66).

In this assignment, you will have an opportunity to face a challenge that some new teachers come across in the field: apprehension to new ideas. You will get an opportunity to practice professional persuasive communication while illustrating to an educational audience the benefits of undertaking two-eyed seeing in the science classroom in junior high and high school.

General Learning Outcomes

Students will...

- ✓ Practice persuasive & professional communication skills
- ✓ Show passion for lifelong learning by encouraging other teachers to pursue new pedagogical ideas
- ✓ Demonstrate an ability to show professionalism when interacting or preparing materials for a more "senior" educational audience

GRASPS

- ✓ **Goal:** you are a new teacher that has been asked to create a short, convincing proposal that will help your cohort understand why two-eyed seeing is needed in your school's science classrooms
- ✓ **Role:** you will step into the role of a new teacher, who is armed with the knowledge of two-eyed seeing and able to provide a fresh perspective on teaching and learning science with this lens
- ✓ **Audience:** you are solving this problem for your fellow cohort of science teachers at your junior high/high school
- ✓ **Situation:** you will work on your proposal individually, sharing it with new teachers at other schools for peer feedback before submitting it to the learning leader at your school for consideration
- ✓ **Product:** you will be asked to submit a proposal in one of the following formats that describes what two-eyed seeing is, why it is a worthwhile endeavor to incorporate it into the science classroom, as well as include tips, FAQ's, or any other helpful information you think is necessary to help your cohort of science teachers implement this principle into their classrooms
 - o Maximum 3-page proposal with 1.5 spacing and Times New Roman font size 11
 - o Maximum 5-minute video with written transcript or subtitles
 - o Visual infographic that highlights key ideas along with a one-page memo that goes more in depth
 - o Other formats to be discussed with the instructor
- ✓ **Standards:** please see rubric (below)

References:

- Alberta Education. (2019). Teaching Quality Standards [PDF]. Retrieved from: <https://www.teachers.ab.ca/TheTeachingProfession/TeacherQualificationsService/Pages/AboutTQS.aspx>
- Wiggins, G. P., & McTighe, J. (2005). *Understanding by design* (2nd ed.). Upper Saddle River, NJ: Pearson Education, Inc.
- Harrison, N., Greenfield, M. (2010). Relationship to place: positioning Aboriginal knowledge and perspectives in classroom pedagogies. *Critical Studies in Education*, 52(1), pp. 65-76.

Rubric

| Criteria | Exceeds Expectations | Meets Expectations | Insufficient | Score |
|--------------------------|---|---|--|--------------|
| Content | The proposal addresses all and exceeds some of the requirements listed in the assignment description. The extra information provided to the audience is applicable, relevant, and would help an in-service teacher make a flawless transition to a two-eyed seeing science classroom in the immediate future. | The proposal addresses all of the requirements listed in the assignment description. The extra information provided to the audience is applicable, relevant, and would help an in-service teacher make the transition to a two-eyed seeing science classroom a good transition given a longer amount of time. | The proposal addresses very few of the requirements listed in the assignment description. The extra information provided to the audience lacking applicability and/or relevance and would be considered unhelpful to an in-service teacher make the transition to a two-eyed seeing science classroom. | /30 |
| Critical Thinking | The information gathered is relevant and interesting. The proposal demonstrates insightful analysis with logical, convincing, and well supported, evidence-based arguments. | The information gathered is somewhat relevant and interesting. The proposal demonstrates a good analysis with logical and evidence-based arguments. | The information gathered is somewhat relevant and interesting. The proposal demonstrates a weak analysis, with arguments that are not based in the evidence. | /10 |
| Organization | The report is organized in a logical sequence, using headings, sub-headings, tables, and appendices that support the flow of the report. | The report is organized in a logical sequence, using headings and sub-headings that somewhat support the flow of the report. | The report is lacks headings and sub-headings that support the flow of the report. | /10 |
| Citations | A complete and accurate list of all types of data sources are created using APA guidelines. | A mostly complete list of all types of data sources are created using APA guidelines with minimal errors. | An incomplete list of all types of data sources are created using APA guidelines with significant errors. | /10 |
| Writing Basics | The writing contains only minimal grammatical and spelling errors that do not affect clarity. | The writing contains some grammatical and spelling errors that minimally affect clarity. | The writing contains significant grammatical and spelling errors that affect clarity. | /5 |