

Faculty of Science Strategic Plan for Indigenous Achievement

November 17, 2015

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This Plan was endorsed by the Faculty Council of the Faculty of Science on November 17, 2015, with the expectation that it will be reviewed on a regular basis.

Executive Summary

The University of Manitoba campuses are located on original lands of Anishinaabeg, Cree, Oji-Cree, Dakota, and Dene peoples, and on the homeland of the Metis Nation. We respect the Treaties that were made on these territories, we acknowledge the harms and mistakes of the past, and we dedicate ourselves to move forward in partnership with Indigenous communities in a spirit of reconciliation and collaboration.

This statement is reiterated at all formal University of Manitoba events. It reflects our provincial and university history, and our commitment to work together in partnership to improve the experience of all our students.

The Faculty of Science has many successful Indigenous students and alumni, and many successes on which to build. We are committed to supporting even greater success levels, and to creating an environment of deep mutual respect amongst all our members. Partnerships, respect, and the recognition that we will all benefit, are the bedrock values of our approach.

This plan lays out why we believe this work is important, our values and goals, what we have achieved to date, our ideas for the future and how we plan to pursue them, and how all this fits into the bigger national and university contexts. It contains general goals, and numerous possible specific actions. Since this is a living document, and the first of its kind for this Faculty (or many other Faculties), we expect many of the specifics to be modified and/or replaced by other ideas. It is very important that new and creative ideas be incorporated and pursued, independent of whether or not they were contemplated when this document was written.

The agenda this document proposes is ambitious and complex. We have found it useful to organize around different goals and groups of people: outreach to external communities and our future students; on-campus support and education of our current students; interacting with, supporting, and seeking the help and advice of our alumni; promoting graduate studies; and supporting undergraduate and graduate students in research. We will examine teaching pedagogy and content, and work to ensure an appropriate physical environment. Essential to all our efforts will be good communications among all our stakeholders, and celebrating and highlighting the many successes of our students.

I. Introduction

The University of Manitoba campuses are located on original lands of Anishinaabeg, Cree, Oji-Cree, Dakota, and Dene peoples, and on the homeland of the Metis Nation. We respect the Treaties that were made on these territories, we acknowledge the harms and mistakes of the past, and we dedicate ourselves to move forward in partnership with Indigenous communities in a spirit of reconciliation and collaboration.

This statement is reiterated at all formal University of Manitoba events. It reflects our provincial and university history, and our commitment to work together in partnership to improve the experience of all our students.

Our province has a large and growing Indigenous population.¹ According to the 2006 Census, 15% of Manitoba's population and 10% of Winnipeg's population self-identified as Indigenous, and the provincial figure is projected to grow from 15% to 19% by 2026. This represents an increase in actual numbers of about 50%. The proportion of our young people is even greater: the 2006 Census reported that 26% of Manitoba's population were Indigenous, and Statistics Canada projects this will increase to 31% in 2017, only two years hence.

This population is significantly under-represented in our student and staff numbers: approximately 7% of this university's undergraduates students, and 4% of our graduate students, are self-declared Indigenous students. Similarly, the culture and traditions are under-represented. All this is detrimental to both our Indigenous and non-Indigenous people. It parallels the situation in numerous other provinces in Canada, and it comprises a challenge that must be met.

However, we have much to build on. As of Fall 2014, there were over 200 self-declared Indigenous students registered in the Faculty of Science and we know, if only anecdotally, that we have many successful alumni. These successes represent strengths and opportunities to pursue.

At the national level, many universities have recognized the need to act. Beyond our sector, a new organization called Canadians for a New Partnership has emerged. It is led by some of Canada's most prominent Indigenous and non-Indigenous individuals, including two former prime ministers, a former National Chief of the Assembly of First Nations, and others of similar stature. Its vision and mission are:

¹ The use of "Indigenous" reflects a recent decision of the University of Manitoba. Numerous offices, programs and documents use "Aboriginal". This Plan attempts to respect the existing usage in each case.

Vision: Towards a better, stronger Canada: building a new partnership between First Peoples and all Canadians so that together we can build the strong economy and values-based society that will benefit this and future generations.

Mission: We will establish and support a broad-based, inclusive, leadership initiative to engage Canadians in dialogue and relationship building aimed at building a new partnership between First Peoples and other Canadians. This initiative holds the promise of better living conditions, education, and economic opportunities for First Peoples, which must be the tangible results of that new partnership

As of April, 2015, over 4,300 Canadians have signed a declaration of support. The University of Manitoba's Aboriginal Students' Association hosted one of their first events here on our campus on January 22, 2015.

The Faculty of Science Strategic Plan for Indigenous Achievement fully aligns with these goals, principles, values and approach.

II. Building Blocks and University of Manitoba Strategies

i. The University of Manitoba Strategic Plan

The University adopted a renewed Strategic Plan, *Taking Our Place*, in 2015. It states:

The University of Manitoba's role in reconciliation, its connections with Indigenous students, partners and communities, and its commitment to Indigenous Achievement are central to the kind of future the University seeks to create. A strongly held view emerged from consultation sessions, the Strategic Planning Committee and the leadership of the University that in order to truly be "Manitoba's University" required that the University of Manitoba's commitment to Indigenous Achievement and to indigenizing the University be elevated to a level of prominence within its strategic plan that traditionally is held by its mission, vision and values.

The University's commitment to our Indigenous students and colleagues pervades this Plan. It is supported by numerous visible actions, including:

- Appointment of an "Executive Lead for Indigenous Achievement", who reports directly to the president and provost.
- Appointment of a senior to advisor to the president, Mr. Ovide Mercredi, and an external advisory committee for Indigenous Achievement.

- Building of Migizii Agamik – Bald Eagle Lodge, which serves as a home for our 2000-plus Indigenous students, faculty, staff and services.
- Issuing of a prominent “Statement of Apology and Reconciliation” regarding the residential schools and their legacy.

ii. Strategic Enrolment Management Planning Framework

The University of Manitoba formally adopted a comprehensive SEM Planning Framework in mid-2013. As of Fall, 2013, self-declared Indigenous students comprised 7.2% of the University of Manitoba undergraduate student body and 4% of the graduate enrolment, distributed as in Table 1 of Appendix 1. Self-declared students comprised a slightly higher share of our graduating undergraduate students that year, 7.9%, and a somewhat smaller share of the graduating graduate student numbers, 3.2%.

That Planning Framework sets specific goals in relation to Indigenous students:

- *By 2018, Aboriginal enrolment should increase to 10% of undergraduate enrolment and 5% of graduate enrolment; and*
- *By 2023, Aboriginal enrolment should increase to 15% of undergraduate enrolment and 8% of graduate enrolment.*

In interpreting these goals, the goal for overall graduate enrolment is also relevant, which is to raise the total number of graduate students by nearly 70%. Together, these 10-year institutional goals are to approximately double the number Indigenous undergraduate students, and to more than triple the number of Indigenous graduate students.

The Planning Framework also includes data on undergraduate student success rates. According to these data, Indigenous student graduation rates are significantly less than those of the student body as a whole.

iii. Pathways to Indigenous Achievement

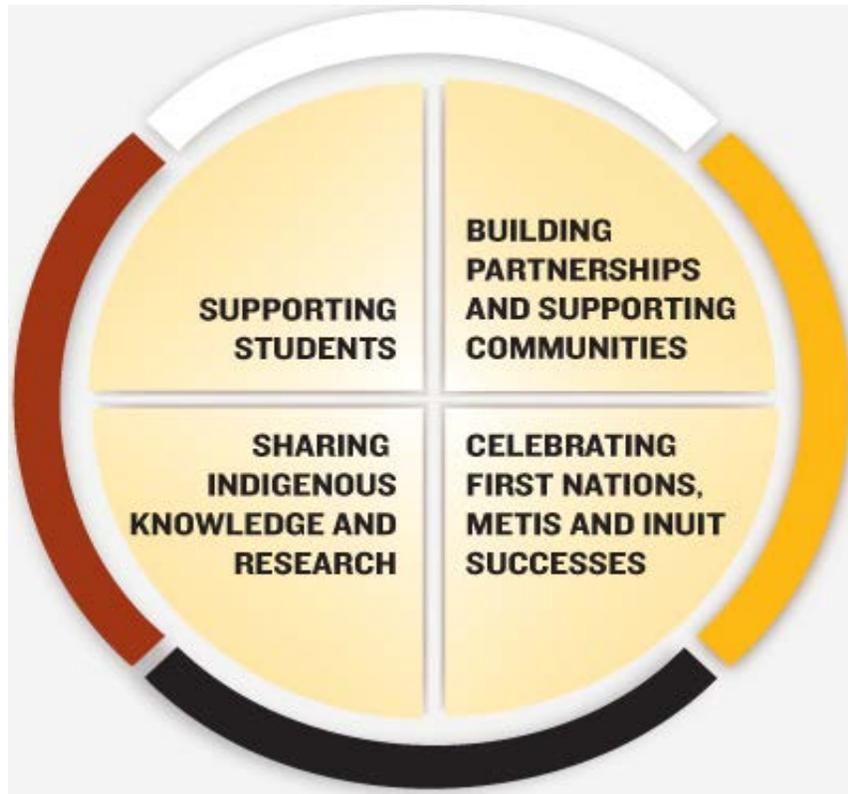
Under the leadership of the Executive Lead, the University of Manitoba has developed a plan entitled Pathways to Indigenous Achievement. It is based on four directions: supporting students; building partnerships and committing communities; promoting Indigenous knowledge and research; and celebrating First Nations, Métis and Inuit Success, as per the diagram below. Its vision and goal are:

Vision: The University of Manitoba will work with a variety of partners to make Manitoba the national centre for Indigenous education and research and in particular to

allow First Nation, Metis and Inuit students to be prepared for and to achieve education success in the full range of academic programs we offer.

Goal: Build and expand an Indigenous presence and visibility at the University of Manitoba and the broader Aboriginal and non-Aboriginal communities that will result in improved access, recruitment, retention and completion for First Nations, Metis and Inuit learners.

Fig. 1. The Four Directions of Pathways to Indigenous Achievement



An action plan is under development.

iv. Other Building Blocks: University, Faculty of Science, and External Opportunities

As noted above, we know we have many current students and alumni, and we have a committed and enthusiastic base of committed faculty, staff and students.

We host the programs of the Verna J. Kirkness Foundation which provides one-week science experiences for Indigenous high school students working in our labs with our faculty and grad students. The Faculty of Science contributes to this program in numerous ways.

Our national research funding agency, NSERC, has programs to encourage Indigenous students in science.

We host and participate in the annual First Nations high school science fair. Over 400 students participate annually.

Both WISE and Let's Talk Science run ambitious outreach programs, reaching tens of thousands of school kids in all walks of life.

University of Manitoba students formed the University of Manitoba Aboriginal Students Association and a Métis University Students' Association (UMASA) approximately 40 years ago, and our Science Students Association recently established an Indigenous Students' Representative and an Indigenous Student Programmer position. These individuals are very active.

UMASA hosted an early meeting of Canadians for a New Partnership in early 2015, aided with financial support from the Faculty of Science.

There are numerous "pathway" programs, including ENGAP in Engineering, and the Access and Aboriginal Focus programs which are housed in Extended Education.

The Access and Aboriginal Focus Programs are increasingly active in areas of interest to us:

- They run focussed courses and programs. They have recently strengthened their science component, with financial support (seed money) from the Faculty of Science
- They organized a 2-day symposium on teaching math and science in August of 2014, and are planning a practical, follow-up workshop in 2015.
- They have embarked on an extensive demographic and academic study of students in the Access Program, as well as self-identified UM Indigenous students, from 2006 to present. The objective is to develop multivariate statistical models in order to provide evidence-based recommendations to programs that enhance student support and success.

There are many related units and organizations both on and off campus which are of direct relevance to our endeavours. All can be considered potential allies and “building blocks”. They are listed for ease of reference in Appendix 2.

Finally, there are numerous sources of funding available to support undergraduate and graduate students. Cataloguing them has only begun.

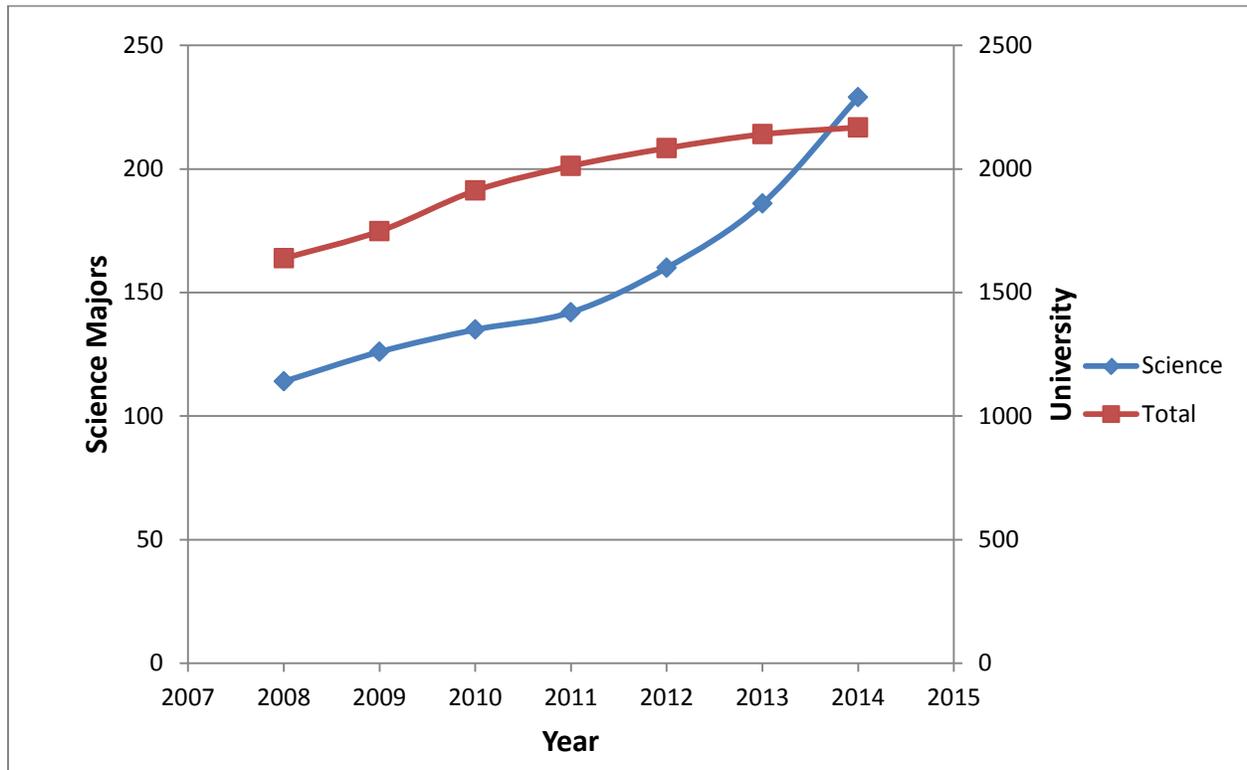
III. Faculty of Science Strategic Plan for Indigenous Achievement

In contemplating how to best proceed, we begin by summarizing what we know, then proceeding to what we have accomplished to date, and then directions for the future.

i. Student Numbers

Figure 2 shows the numbers of self-declared undergraduate students registered in the Faculty of Science over the past seven years, blue curve and left-hand axis, and the university total, red curve and right-hand axis. There has been a very healthy increase in the Faculty of Science numbers over this period, rising from 114 to 229, almost exactly a factor of two. (The penultimate points on these figures are the ones in the tables of Appendix 1.)

Fig. 2. Enrolment Numbers: Faculty of Science (left axis) and university totals (right axis.)



As of 2013, self-declared Indigenous students comprised 4.6% of our student body. This rose to 5.6% this year (Fall 2014), which comprises 10.6% of all U of M Indigenous undergraduates. Updated graduation numbers are not yet available. As in the university totals, a slightly higher percentage of our graduates, 4.7% in 2013, are self-declared Indigenous.

Comparisons with other Faculties and the university as a whole are interesting. Overall, our student body numbers are similar to other science-related faculties at the university (see Appendix 1). They are lower than Arts (7.7%), University 1 (9.6%), and the university as a whole (7.2%), but they are rising more quickly. In fact, the number of self-declared students in U1 declined noticeably in Fall of 2014, in both absolute and relative terms.

At the graduate level, there were 5 students in the Faculty of Science in 2012, which is 1.5% of our graduate students. This rose to 9 students, which is 2.7%, the next year. We do not have data on degrees awarded.

We do not have good data on our students' success rate, at either the graduate or undergraduate levels, and the data we do have seem to paint conflicting pictures. Comparisons of our graduating and current student numbers suggest our Indigenous student success rates are at least as good as our overall students' success rates. Data in the Strategic Enrolment Management Plan indicate otherwise. At this point, we can only speculate as to the source of this apparent paradox.

ii. Information Gaps

There is much we could do: ideally, we would have good data to base our decisions on how to focus our efforts. However, one could ask many questions and seek great volumes of data, so we need to focus on what we do and do not actually know, and then what would be most useful to learn. Some of this information may be accessible by other parts of the university.

This Plan is about success and achievement but, as noted above, the only data we have on such matter is, at best, unclear. Some data suggest that self-declared Indigenous students have a greater success rate than our student body as a whole. This conclusion would be consistent with data reported in British Columbia on students leaving university across that province. This conclusion would direct us to focus primarily on outreach to the school systems. Other data imply that the success rates are significantly lower than for the student body as a whole, which would suggest we should focus on supporting the students who are here. Which picture is correct, and where should we direct our efforts?

The explanations may lie in the self-declaration protocols. Students can self-declare at any time in their career, and multiple times and for multiple purposes. If they do shortly before graduation, this choice would raise the graduation numbers without a parallel increase in the overall student body numbers. We do not know how, or if, this would impact these statistics. There is at least one other issue: If students leave in the first two weeks of their arrival, then they do not appear in these statistics because they are not counted until later.

There is another issue with the self-declaration protocols: at this point in time, they do not permit us to identify or even approach those students who have self-declared, and so we cannot identify where our students come from, why they are successful, where they go, etc.

Some Things We Do and Do Not know

1. We do not know who these students are. The current self-declaration process prevents us from identifying our students, or directly contacting them even if we could.
2. We do not know what fraction of Indigenous students self-declare, at what stage of their studies they do so, or if the proportions are changing.
3. We do not know the success rates for those who do attend, and how these rates compare with those of the student body as a whole.
4. We have not identified the most important success factors or barriers for students coming to the University of Manitoba, and for succeeding once here.
5. We know that we have many successful students, but we have very little information on what they are doing after graduation.
6. We do not know from which areas of the province and which schools our students do or do not come. If there are particular such areas or schools, what are the common elements?
7. We do not know why students choose the areas of study they do.
8. We do not know how many University 1 students actually enter the Science complex. We have been told this is an issue. Appendix 3 provides an analysis.
9. We do not now have a coherent view of which schools LTS, WISE, ENGAP, our recruiting office, etc. visit, and if these visits have measurable impact.
10. We have very limited data regarding Faculties of Science at other universities, but we know that our commitment to Indigenous success is shared with other universities, and that there likely to be lessons learned from them.

iii. Values

- We value science, its methods, its beauty and its power.
- We value all people, cultures and perspectives.
- We value all contributions to science.
- We value partnerships and collaborations.

iv. Goals

Our goals can be summarized as:

1. Provide a high quality science education to our Indigenous student, as for all our students.
2. Increase Indigenous student participation in research at the undergraduate and graduate levels.
3. Help foster an interest in mathematics and science among the Indigenous school population, and motivate them to study and excel in mathematics and science. Attract more students to the University of Manitoba with an interest in mathematics and science.
4. Help foster student success, e.g., through outreach, working with Extended Education, and other units. Identify barriers to success: academic, financial, or other.
5. Introduce Indigenous perspectives and inclusive pedagogy in our courses as appropriate.
6. Provide information for non-Indigenous faculty, staff and students on matters such as the content and importance of the treaties, pedagogy, and other.
7. Foster mutual respect for, and understanding of, the cultures of all our students and staff. Recognize and celebrate Indigenous contributions to science.

These goals, at least initially, focus on Faculty of Science students, past, current and future. We hope that our efforts will result in benefits to students throughout our university and, at the same time, we hope to continue to learn from other faculties here and at other universities. Two longer-term goals are:

1. Demonstrate the importance and relevance of science to Indigenous communities in Manitoba.
2. Foster the success of Indigenous students throughout the university and elsewhere.

v. Progress to Date and Action Plan

More than 30 volunteers have stepped forward to participate in this initiative. This group has had extensive discussions about what can and should be done, and how different activities align with individual strengths and interests. As a result, we have organized this important section in three parts. (a) The committee structure that has emerged, with a brief statement of the purpose of each. This largely defines the overall program that is proposed. (b) A summary of what has been done so far. (c) A list of possible specific future actions.

(a) Focus Areas and Action Groups

1) Faculty of Science Indigenous Achievement Committee

- develop a Faculty of Science Indigenous Achievement Plan, to be brought forward for approval.
- lead and actively participate in the Plan's Implementation and the activities in it.
- attend and participate in related activities on campus.
- Develop an inventory of student financial support
- The members are all 30 volunteers, with chair appointed by the Dean of Science.

2) Outreach

- Focus on future students
- interact with K-12 students and their families to encourage interest in science in general and in pursuing science at the University of Manitoba
- actively partner with and assist activities of U of M student outreach groups such as WISE, Let's Talk Science and Biomedical Youth Program
- actively partner with other organizations such as the Kirkness Foundation, MFNERC, Career Trek, the Biomedical Youth Program, and others listed in Appendix 2.
- promote and assist in participation in outreach activities (such as Kirkness Foundation, Science Fairs, student outreach activities) by staff of the Faculty of Science

3) Education

- focus on current students
- an inclusive pedagogy
- carry out an inventory of current Indigenous-related curriculum both within Science and elsewhere, and identify possible opportunities for new/modified curriculum
- focus on success as well as participation data

4) Alumni

- Focus on our graduated students (alumni)
- identify and reach out to alumni and potential mentors, and keep track of them
- organize peer mentoring and "showcasing success" events.

5) Research and Graduate Opportunities

- Identify and help promote opportunities for students to get involved in research: NSERC USRA's, H2O CREATE
- Carry out an inventory of current Indigenous-related research, and identify possible opportunities
- Identify resources and opportunities
- Consider problem-solving workshops

6) Communications

- ensure communications among the participants within the Faculty of Science and external to it, e.g., Migizii-Agamik, Student Affairs, etc
- with the alumni committee, identify alumni, and current students and staff
- promote events and opportunities
- promote our students' successes

7) Coordinating Committee

- keep things going overall
- integrate into a "plan"
- identify gaps in the overall program
- monitor progress
- write annual report
- chaired by chair of full Indigenous Achievement Committee

(b) Actions to Date

Completed

- 2 day symposium on teaching held in August, 2014
 - Follow-up workshop planned for summer, 2015
- Create an Indigenous Science student newsletter
- Create Indigenous Science student facebook page
- Promote NSERC USRA program
- Let's Talk Science and WISE events
- Creation and organization of the initiative, draft discussion strategic plan/discussion documents, organization of groups, foci, and chairs.
- Inventory of relevant offices and units (Appendix 2)
- Analysis of where the math and science courses are held: see Appendix 5
- Consultation with Lakehead U

In Progress

- Incorporate an Indigenous flavour for the SSA lounge renovations
- Identify and publish a list of financial aid and support (just started)
- Identify the data that would be most useful to guide our efforts (just begun)

(c) Future Possibilities

The planning team has identified many specific actions that could be undertaken. Some are short term, some long. Some fall neatly into one of the four directions in *Pathways to Indigenous Success*, but others span multiple categories or could be considered “foundational”. There are, undoubtedly, many more that people will think of. Here is a relatively unsorted list of ideas to date.

1. Complete the Faculty of Science Strategic Plan for Indigenous Success.
2. Identify and collect data most relevant to understanding the most important barriers and success factors.
3. Hold an information session for faculty and staff on the content, importance and implications of the treaties.
4. Consider recommending new awards for staff and students, e.g., a new category for UMFA merit awards or a new Faculty of Science award for faculty and staff
5. Science tours or ceremony, including meet the dean.

6. Establish bulletin board corner at Migizii
7. Establish SSA-Migizii liaison team
8. Check out the planetarium for possible uses
9. Clarify privacy rules
10. Identify Indigenous alumni, grad students and other potential resource people
11. Participate in annual First Nations Science Fair
12. Identify Indigenous Science grad students and set up mentoring
13. Create Indigenous pages on the Faculty of Science web site
14. Faculty Meet and Greet
15. Annual celebrating success events – alumni, senior students
16. Student mentoring programs
17. Indigenous TA's – at Migizii
18. Support Let's Talk Science
19. Continuing improvement to social media
20. Bring WISE back to multi-faculty and become part of process
21. Showcase students in Indigenous Connect
22. Join Pacific Institute for Mathematical Sciences and start working on appropriate workshop (membership application has been submitted; likely success in spring) consult with PIMS education consultant
23. Explore partnerships with MFNERC, etc
24. Support Kirkness Foundation and events
25. Invite representative from U of Ottawa to discuss her outreach and mentoring programs
26. Develop proposal for a Knight Lecturer
27. Examine success of our on-campus prep programs (some in progress)
28. Consult University College of the North
29. Continue teaching symposium, with workshops
30. Expanded orientation event
31. Prepare proposals for Indigenous courses and/or course relevance
32. Consider requirement that all students take a course with Indigenous content (Lakehead requires ½ course content; U of Winnipeg is considering)
33. Long term:
 - a. Science cohort
 - b. Institute for Indigenous Science Teaching and/or Research
 - c. Research projects on matters of particular relevance
 - d. Workshops on matters of relevance to Indigenous communities
 - e. ...
34. ...

IV. Appendix 1. Enrolment Statistics at the University of Manitoba

As of 2013, self-declared Indigenous students comprised 7.2% of the University of Manitoba, distributed as in Table 1. There were 186 such students registered in the Faculty of Science, comprising 4.6% of the total number of Science students.

Table 1: Self-Declared Indigenous Undergraduate Students by Faculty in Fall, 2013

Faculty	Number	Per cent of Total Students in Faculty
Agriculture	22	3.6
Architecture	14	4.6
Art	25	8.1
Arts	318	7.7
Business	55	3.1
Dentistry	6	3.9
Education	68	8.6
Engineering	84	5.1
Riddell	29	6.2
Extended Ed	118	11.4
Human Ecology	35	6.8
Kinesiology	43	8.7
Law	26	8.2
Medicine	28	5.0
Music	8	3.2
Nursing	115	13.0
Pharmacy	13	6.1
Science	186	4.6
Social Work	202	26
University 1	572	9.6
Grad Studies	158	4.2
University Total	2,140	7.2

We also have data on the number of graduating students each year, shown in Table 2 which includes the per cent of the total number graduating each year in each Faculty.

Table 2: Numbers of Graduates by Faculty (3-year average, 2011-2013)

Faculty	Number	Faculty Total	Per cent of Total Grads in Faculty
Agriculture	2	78	2.6
Architecture	4.5	96	4.7
Art	4	77	5.2
Arts	59.5	855	7.0
Business	17	434	3.9
Dentistry	1.5	29	5.2
Education	43	414	10.4
Engineering	7.5	185	4.1
Riddell	7.5	122	6.2
Extended Ed	N/A	N/A	N/A
Human Ecology	6	113	5.3
Kinesiology	8	127	6.3
Law	6.5	97	6.7
Medicine	5	101	5.0
Music	1	48	2.1
Nursing	19.5	214	9.1
Pharmacy	3	48	6.3
Science	22	468	4.7
Social Work	48	141	34
University 1	N/A	N/A	N/A
Grad Studies	25.5	787	3.2
University Total	295	3,742	7.9

Table 3 compares the student numbers and graduation profiles, simply the last column of each of Tables 1 and 2. For example, 4.6% of all Science students were self-declared Indigenous students, and 4.7% of our graduates were. University-wide, 7.2% of students, and 7.9% of our graduates, were self-declared Indigenous students. These numbers mean that self-declared Indigenous students comprised a slightly higher proportion of our graduating student numbers than of our student body as a whole.

Table 3: Per cent of Students vs per cent of Graduates

Faculty	Per cent of Registered Students in Each Faculty	Per cent of Undergrad degrees granted in each Faculty
Agriculture	3.6	2.6
Architecture	4.6	4.7
Art	8.1	5.2
Arts	7.7	7.0
Business	3.1	3.9
Dentistry	3.9	5.2
Education	8.6	10.4
Engineering	5.1	4.1
Riddell	6.2	6.2
Extended Ed	11.4	N/A
Human Ecology	6.8	5.3
Kinesiology	8.7	6.3
Law	8.2	6.7
Medicine	5.0	5.0
Music	3.2	2.1
Nursing	13.0	9.1
Pharmacy	6.1	6.3
Science	4.6	4.7
Social Work	26	34
University 1	9.6	N/A
Grad Studies	4.2	3.2
University Total	7.2	7.9

V. Appendix 2: Potential Partners and Related Programs

Internal

U of M Science Library

Our Science Library is an integral part of the Faculty of Science and our programs, and is an active partner in this initiative.

Science Students Association

Indigenous science students opted to request a position on the executive of the SSA rather than form a separate organization. The SSA enthusiastically embraced this request, and the position was created and filled in 2013. The SSA since added a second such position.

Let's Talk Science

LTS is a volunteer organization operating under the auspices of the Associate Dean of Science. It presents science workshops to school groups, and other events such as Evening of Excellence, and shopping mall displays. It visits about 10,000 school children per year.

Women in Science and Engineering Program

In 1990 WISE (Women in Science and Engineering) Kid-Netic Energy, the University of Manitoba's largest outreach initiative, was formed. At WISE Kid-Netic Energy we envision the youth of Manitoba inspired and empowered by the possibilities of science, engineering and technology. We envision a Manitoba where all youth, regardless of background, gender or socio-economic status are enriched in their science, math and technology education. To make our vision a reality, our organization offers science and engineering workshops, clubs, and camps to youth from Kindergarten to Grade 12 throughout the entire province. Annually we see between 20 000 and 30 000 kids. Out of those students roughly 30 per cent are Indigenous. We have strong ties with Skownan First Nation, Sapotoweyak First Nation, Norway House Cree Nation, and Wanipigow, as well as the northern communities of Churchill, Thompson, The Pas/OCN, Flin Flon and Dauphin. We travel to a number of other reserve communities as well. In an effort to better reach Manitoba's Indigenous population we recently hired an Indigenous Outreach and Recruitment Officer that we share with ENGAP (the Faculty of Engineering's Indigenous Access Program). Additionally, we run an Adopt-a-Class program within the inner city, along with an inner-city Girls Club. It should also be noted that we deliberately hire as diverse a group of undergraduate students as possible to deliver our programming, so that all children have an opportunity to identify with our instructors. The young people that we reach today will become Manitoba's vibrant and diverse workforce of leaders tomorrow; these youth

will be empowered by their knowledge and appreciation for science, engineering and technology.

Migizii Agamik—Bald Eagle Lodge

Migizii Agamik serves as a welcoming home for the 2000-plus Indigenous students at the University of Manitoba and as a safe space where people can come to know traditional teachings and celebrate Indigenous cultures and identities. This building houses the University of Manitoba Aboriginal Students Association office, offices of Indigenous Achievement, Indigenous Student Centre, Access and Aboriginal Focus Programs, and the offices of Professors and graduate students in the Department of Native Studies.

Indigenous Student Centre

The Indigenous Student Centre² provides cultural, academic, and personal supports to all Indigenous students at the University of Manitoba. It is open to all Indigenous students, regardless of origin (First Nations, non-status, Inuit and Metis). The Centre also organizes events that celebrate the success of Indigenous students and promote Indigenous cultures and identity, such as the Annual Traditional Graduation Pow Wow and the Elders and Traditional Peoples Gathering. The Centre's team is a varied group which includes Elders, Cultural Advisors, Student Advisors, Administrative Assistants, and Counsellors. ASC's mission statement is as follows:

“Providing student support in a manner consistent with the culture and values of Indigenous Peoples for the purpose of increasing/enhancing the accessibility and retention of Indigenous students. The Indigenous Student Centre is dedicated to the creation of an educational environment that includes the affirmation of Indigenous cultures, values, languages, histories, and ways of life by virtue of increasing the knowledge foundation offered at the University of Manitoba.”

And its vision statement is:

“Empowering the next generation of proud Indigenous world leaders who are balanced in their traditional, cultural, and intellectual knowledge”

Promoting Aboriginal Community Together (PACT)

PACT is an Aboriginal student peer support program. PACT provides students with social, cultural and academic development opportunities, student activities, and the opportunity to be

² The Indigenous Student Centre changed its name from the Aboriginal Student Centre effective June 1, 2015.

a Neechiwaken (a Cree word, which means a friend on life's journey). The main objectives of PACT are to ease transition into university life and to enhance the student experience at the University of Manitoba. PACT is facilitated by staff at the Indigenous Student Centre.

Indigenous Circle of Empowerment (ICE)

ICE is a program that enhances and supports the development of our future Indigenous leaders. ICE provides Indigenous students with leadership training and a platform of support, resources, and culture from which they can reach their full potential. ICE members attend leadership workshops, complete public speaking training (i.e., Speech Craft), organize capstone projects, and participate in conferences. Intake of new members occurs every September. ICE is facilitated by staff at the Indigenous Student Centre.

Extended Education, Access and Aboriginal Focus Program

The Division of Extended Education houses the Access and Aboriginal Focus Program. The Faculty of Engineering has an Access Program (ENGAP) and the Asper School of Business has the Aboriginal Business Education Partners Program, both of which provide support to their students. This section focuses on the programs in Extended Education.

The Access program is intended to address the academic needs of a group of students who would have a much smaller chance of success without the supports provided by the program. The program provides intensive personal and academic counseling, and offers alternate, small sections of Arts 1110, English 0930, English 0940, and some sections of Chemistry and Biology. Students write the same final exam as the students in the other sections. The classes may be open to non-Access students if room in the class is available

Students are accepted into the program through an interview process, and admission is generally restricted to those who both need the supports provided, and who are expected to succeed with these supports. There are currently 255 active students, approximately 85% of whom are Indigenous, with the remainder being non-Indigenous and/or international. Many are from northern Manitoba. The majority come directly in as new and first year students, but some who are already here are also accepted.

The Access and Aboriginal Focus Program (AAFP) also delivers certificate and diploma programs, which incorporate Indigenous Knowledge into the curriculum, with the intent of ensuring that the content and delivery meet the needs of a particular Indigenous community and/or student body. The certificate programs have a preponderance of non-degree credit courses whereas AAFP diploma programs deliver degree credit courses, all of which equate to half a degree. There is the capacity for an AAFP certificate and/or diploma to be delivered on

campus if there is a need such as with the Aboriginal Environmental Stewardship Diploma (AESD) but, for the most part, the certificates and diplomas are delivered primarily in Indigenous communities based on the need and relevance to the local communities. AAFP also delivers a number of other programs in Indigenous communities and the Indigenous Community Wellness Diploma in Sagkeeng First Nation, and classes on the Nisichawayasihk Cree Nation.

AAFP has two faculty positions within the math-science program. These positions are involved in research, the delivery of specialized pedagogical frameworks with front line support to students. Dr. Rod Lastra's (Program director) area of expertise rests in the Math/Science arena and Dr. Kari Kumar's primary expertise rests in the design of technology-enhanced learning and teaching in the sciences arena. Dr. Lastra is currently developing a non-credit Math "workshop" for delivery beginning in winter 2015. He is working with the departments on these initiatives. In addition, he is also working on curriculum content for the Indigenous Environment Stewardship Program. Dr. Kumar is currently helping develop online instructional resources for the chemistry course (CHEM 1300), and is expected to do likewise for the Biology and Math.

Funding constraints and the need for non-credit "bridging" courses combine to create an ongoing issue for students: band funding, student aid, and funding for international students are restricted to students taking a minimum number of credit courses, without recognition of non-credit courses. This can steer students away from non-credit courses, even when they need them.

Extended Education also runs a Math skills course. This is not part of Access or the Aboriginal Focus Programs, but it is likely that significant numbers of Indigenous students take this course. It would be useful to know how well students who complete this course do in subsequent courses.

There are research projects underway within Extended Ed to try to follow student histories and assess the efficacy of various programs.

Faculty of Education

The preparation of teachers for the province is of paramount importance to the future success of students. The Faculty of Education has established a new position, Director of Indigenous Initiatives, and has expressed an interest in working with members of the Faculty of Science on these matters.

University of Manitoba Aboriginal Students Association

UMASA is “a non-profit organization created to help support our students at the University of Manitoba.” It “provides support and information on Aboriginal issues by planning and organizing recreational, political, and cultural events throughout the year.”

External

Verna J. Kirkness Science and Engineering Program

<http://www.vernakirkness.org/>

The Verna J. Kirkness Science and Engineering Program addresses the under-representation of First Nations, Métis and Inuit students at Canadian universities. One of the factors contributing to this is the lack of academic role models for these students. The Foundation addresses this by offering scholarships to Indigenous grade 11 students to spend a week at a Canadian university interacting with scientists in their research laboratories. During their week on campus the students have the opportunity to meet role models, learn about the support systems that are available to them on campus and experience the excitement of doing research.

The program was hosted by the University of Manitoba in 2014. Most of the approximately 30 came from Manitoba, but there were a few from British Columbia, Saskatchewan and New Brunswick. It is expected to expand to include the University of Saskatchewan in 2015, and additional sites in 2016 and beyond.

Biomedical Youth Program and Camp

The Biomedical Youth Program (BYP) develops and delivers several community-based and outreach projects:

- Aids in the recruitment of judges for the annual Winnipeg Schools' Science Fair.
- Annual Summer Camp - The Annual Youth Summer Camp is a 5-day, free of charge camp for grade 5-12 students, organized at several locations in the city, including the University of Manitoba Bannatyne Campus, and Winnipeg's North End - at Niji Mahkwa School. The camps provide the opportunity for hands-on activities ranging from cell culture to blood typing. The first camp in 2006 hosted 15 youth participants and has grown to over 220 Indigenous and non-Indigenous students today.
- Inner City Science Centre - Another key component of the BYP is the Inner City Science Centre at Niji Mahkwa School, 450 Flora Avenue, that brings high-end science resources directly to the community it serves. Rather than bringing equipment to the community

for an hour and then leaving, the Centre creates a lasting opportunity for academic enhancement right in the school. By being a permanent, long-term fixture in the community, the Centre is a hub for increasing awareness among students and parents about career opportunities in the science and medical fields and offers mentoring and research apprenticeships at a critical early age.

- Learning and Leading in Science Education for Educators (Teachers) - The BYP has organized and delivered several workshops and seminars for the continuous professional development in hands-on science for primary, middle, and high school teachers.

Career Trek

<http://www.careertrek.ca/>

Career Trek's vision is to help build a Manitoba where everybody can realize their full career or educational potential. It is a not-for-profit organization that helps young people who would most benefit from their programming to discover post-secondary education. They offer kids hands-on experience in different careers, which gets them excited about one day going to university, college or taking part in an apprenticeship. It also helps them figure out what professions they would enjoy, and which ones they might not. They invite girls and boys as young as 10 to post-secondary institutions to try as many as 80 careers in 17 different fields. They later focus on one specific occupation and learn directly from industry professionals. After that, they can apply what they've learned by mentoring new participants. Career Trek also has programs specific to rural youth and young mothers. They currently have 160 full and part time staff, and help more than 400 young people every year

Health Career Quest Summer Camp

<http://ornh.mb.ca/index.php/ornh-initiatives/high-school-students/health-career-quest-youth-camp>

The Health Career Quest Summer Camp is an initiative of Rural and Northern Health, and is associated with the Biomedical Youth Camp. The U of M Access Program is a sponsor. The camp is offered to students who live in Northern communities (with preference given to First Nations students), and they stay in St. John's College residence for the duration of the camp.

We typically end up recruiting some students from this camp into the Access Program once they complete high school, and this information is collected on the application forms (though I don't know that there has been a yearly record kept of how many summer camp students we have recruited).

Indspire

<http://indspire.ca/2014-new/>

Indspire is an Indigenous-led registered charity that invests in the education of Indigenous people for the long term benefit of these individuals, their families and communities, and Canada.” The activities/resources associated with Indspire include:

- A mentorship program that is geared towards BEd students, which is directly aligned with our discussion about helping to prepare new teachers to teach Indigenous students.
- A collection of successful practices which “include documented research, frameworks, models, and educational strategies that have worked to enhance student success.”

Manitoba First Nations Education Resource Centre

<http://www.mfnerc.org/>

MFNERC was established in 1998 by the Assembly of Manitoba Chiefs. It provides the province’s leading education, administration, technology, language and culture services to First Nations schools in Manitoba. To date, MFNERC provides services and support to 58 First Nations schools from 49 Manitoba First Nations, with a variety of services and support. As well, professional development training is provided for school board members, administrators, teachers and teaching assistants. MFNERC works in partnership with Manitoba First Nations to ensure the highest standards of education are achieved in First Nations schools.

MFNERC promotes and encourages First Nations involvement in all aspects of the development and implementation of educational change.

Centre for Indigenous Environmental Resources

<http://www.yourcier.org/>

CIER was founded in 1994 by a small group of First Nation leaders from across Canada who recognized the need to create their own technical, non-political, education and research-oriented organization that would assist Indigenous peoples to build their capacity to solve environmental problems affecting their lands and resources. They envision 'Sustainable First Nation Communities and a Healthy Environment' and their mission is to 'assist First Nations with building the capacity to address the environmental issues they face.'

Canadians for a New Partnership

www.cfnp.ca

This is a new organization whose values we share and whose approach we support. We look forward to seeing how they develop and contribute. It is described in the Introduction to this paper.

VI. Appendix 3: Where Students are Taught First Year Faculty of Science Courses

Goal

To probe the comment we heard that Indigenous students do not come to the Science area, because their classes are elsewhere. The analysis below addresses the question “Where are students taught Faculty of Science courses?”, which is not the same as “Where are Faculty of Science courses taught”, because our largest classes tend to be taught outside the Science area (which includes the Computer Science area). In other words, this counts the students, not the sections.

Methodology

1. The basis is a spreadsheet supplied by the Registrar with the Fall 2014 course and section registrations. It is assumed that this is a typical semester.
2. All 1000 and the one 0900 course were included. The enrollment data are the “actual enrollments” column.
3. The remaining spreadsheet has classes, labs and tutorials. Only the classes (“A” sections) were counted, because including the others would double count students.
4. All the student lectures which were in the Science zone, and then all in total, were calculated and used for the numbers in the table below.
5. Information on the labs and tutorials are added as a comment.

Dept.	In Science	Total	% in Science	Comments
Bio	1,636	3,269	50%	Many, not all, do labs in Science
Chem	759	1,395	54%	Many do labs in Science
CS	599	719	83%	All have labs in Science
Math	1,038	2,823	37%	Most, not all, labs are in Science
Micro	255	470	54%	The other 46% have no labs, so not in Science
Phys	473	1,018	46%	Labs are in Science
Stats	442	1,690	26%	No Labs, so 74% not in Science
Faculty Totals	5,205	11,384	46%	

Observations

1. By student numbers, 46% of the lectures in Science courses are *received* in the Science zone. This is slightly less than one half.
2. Many students who do take lectures elsewhere would visit the Science zone to do labs.
3. It is probably more useful to think of things in terms of departments rather than the Faculty of Science as a whole. In particular, students might be taking Statistics as the only Science course one semester. 74% of them would not visit the Science zone.
4. It appears that many students taking either Math or Stats would visit the Science zone only for the tutorials, if at all.