

Sitting in a Design Chair
Reflections on the NSERC
Chairs in Design Engineering Program

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NSERC

The Natural Sciences and Engineering Research Council of Canada



Cause and effect

- **Concern re design education existed/exists in Canadian industry and engineering profession**
- **the program was/is Dr. Tom Brzustowski's unique response**



“NSERC’s goal in setting up the Chairs is to expand and improve Canada’s capacity and performance in all aspects of design engineering, including environmental design.”



Program initiated in 2001

- 5 chairs awarded, one in Manitoba**
- currently 12 active Chairs**
- NSERC Goal is 16 concurrent Chairs**



Individual Chair resources

- \$1 000 000 over 5 years
- primarily matched “externally”
- some university match accepted



At minimum, this provides the Chairholder

- \$400 000 per year**
- over 5 years**



Beyond individual campuses

- **NSERC arranges semi-annual meetings of all Design Chairs**
- **Permits sharing experiences and ideas**



Chair structure

**“ . . . partnership with industry,
federal and provincial
governments, and other private or
public sector organizations.”**

rather ill defined



Design Engineering definition

. . . a creative, iterative and often open-ended process subject to constraints which may be governed by . . .”

rather ill defined



**And some
Engineering “philosophy”
considerations that impacted
our Manitoba Chair**



Billy Koen's Engineering Method

“ . . . the strategy for causing the best change in a poorly understood or uncertain situation within available resources.”



Henry Petroski

**“Science is about knowing
Engineering is about doing”**



Philosophy notwithstanding,

**Consider the Manitoba
NSERC program**



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What did we do (try to do)?



Our initial conditions

- a research based Faculty
- few profs with design experience
- a “full” curriculum
- Accreditation pressure
- relatively unknown “potential”



Our reactions

- **Establish the Chair as a DESIGN CENTRE**
- **Accept responsibility for First Year Design Class**
- **Employ a computer literate Draughtsman**



More reactions

created Engineers in Residence positions

- Retired engineers, hired part time
- Provide design experienced staff
- Provide personal connections with local industry
- Provide Student Club Leaders



And

- **Provided staff to teach Technical Communications**
- **Introduced design “influence” in classes taught by Design Group staff**



And

- **Employed a Public Relations person to assure our “message” got out**
- **Provided public relations services to the Faculty in general**



And

- **Provided staff to teach Technical Communications classes**
- **Provided staff support for Faculty Committee dealing with accreditation concerns**



Fortunately

- we received twice the required “matching” funds**
- we grew into a “regular” part of the Faculty budget**



Links to profession in Manitoba

- Created regular *Thoughts on Design* (2001-2017) and *Engineering Philosophy 101* (2006 – 2017) columns for the **Keystone Professional**
- A book, *On Design*, (2017) based on 2001-2015 columns



In grad school

- **Created, and taught, an Engineering philosophy class**
- **In recent years, the largest non-required grad class in the Faculty**
- **attracted MBA and PhD Education students**



The Canadian Engineering Education Association was created by Chairholders across Canada



**But outside of NSERC definitions,
a recent philosopher's
perspective might have helped
shape our Manitoba proposal**



In his book,

***Intuition Pumps and Other
Tools for Thinking***

Daniel Dennett suggested

***“A tool wielded well becomes almost as
much a part of you as your hands and
feet, and this is especially true of tools
of thinking.”***



**If design is engineering's
“tool of thinking”, is assisting
students as they hone that
“tool”, a reasonable target for
a Design Chair program?**



ADVENTURER TRAILBLAZER CHALLENGER DEFENDER VISIONARY INNOVATOR
TRAILBLAZER CHALLENGER DEFENDER VISIONARY INNOVATOR EXPLORER TRAILBLAZER CHALLENGER DEFENDER VISIONARY INNOVATOR EXPLORER

Nonetheless



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Manitoba has benefited from 15 years of NSERC Design Chair support

- 2001 – 2011 Ron Britton**
- 2012 – 2017 Doug Ruth**

- we hope our good luck is not over



**Looking back,
was it worth the effort?**



**I believe the 15 years of NSERC
Design Engineering Chair
support at the University of
Manitoba have started us toward
meeting Dennett's "tools"
suggestion**



I believe that NSERC Design Engineering Chair support at many universities in Canada has allowed them to make similar strides



**I believe that some Design
Chairs missed the opportunity
that the NSERC Design
Engineering Chairs program
provided**



**I believe Tom Brzustowski can
take pride in the impact his
initiative has had on Design
Engineering Education in
Canada**



**I believe Tom Brzustowski's
Design Engineering Chair idea
could be transplanted to other
jurisdictions.**

**Canadians like to share
our successes**



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Thank you



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