

Challenges Associated With High School Students Transitioning to University Science – The View From Both Sides



OND University of Waterloo, April 30, 2015



UNIVERSITY OF WATERLOO
FACULTY OF SCIENCE

Teaching Fellows Faculty of Science at UW



Rohan Jayasundera (Senior Fellow)



Dr. Jonathan Witt (Biology)



Dr. Carey Bissonnette (Chemistry)



Dr. Wing-Ki Liu (Physics)



Dr. Brewster Conant (Earth Science)



Initial Motivation for Addressing This Issue

- Students entering 1st year science struggle
- Help high school teachers get students better prepared for University
- Benefit both students and UW profs



Previous Presentations / Consultations

Meetings



Science Teachers Association of Ontario
(**STAO**) meeting 2014



Waterloo Region District School Board
(**WRDSB**) PD day 2015



UNIVERSITY OF WATERLOO
FACULTY OF SCIENCE

Highlighted Differences Between High School and University

HIGH SCHOOL	UNIVERSITY
Reproduce what were taught	Apply what you've learned
Most learning is in class	Most learning is outside class
Effort counts	Results count
Small classes (<30)	Large Classes (100s+)
~4 courses per semester	~8 courses per semester
Others are responsible for you	Personal responsibility



Challenges with First Year Students

- **Variability in Student Skills**
 - Numeracy and literacy
 - Note taking skills / ability to extract important info
- **Poor conceptualization/problem solving skills**
 - Many try to memorize their way through courses
 - Many see science as a set of absolute truths
- **Poor time management & decision making**
 - Coping with 5 courses and 3 labs
 - Skipping class, not completing work, plagiarism



What We Learned From the Teachers

- **They Have a Positive Attitude Toward Teaching**
 - They share our goals and concerns
 - Producing educated and responsible citizens
 - Engaging students who are easily distracted or unmotivated
- **They Have Institutional/Systemic Constraints**
 - Specific school board rules (e.g., must accept late work)
 - May not have topic specific staff
 - Inability to deliver/offer labs
- **They Want Our Help**
 - Outreach
 - Teaching modules
 - Want to bridge the gap



Main Insights from Discussions

- We may be less constrained than they are
- Our large 1st year classes may be failing to build on good aspects of high school training
- We need to do a better job of addressing the wide variety of student backgrounds & learning styles
- We may not be doing enough to help students cope and may be overloading them



Bridging The Gap

Have we properly identified the problems ?

How far can the Universities go ?

How can we help the high schools change ?

What do we need to do next ?



Important Next Steps

Changes to first year courses

Connect students to existing support programs & resources

Advocate for change in high schools



Thanks!



Rohan Jayasundera (Physics)
jayasundera@uwaterloo.ca



Jonathan Witt (Biology)
jwitt@uwaterloo.ca



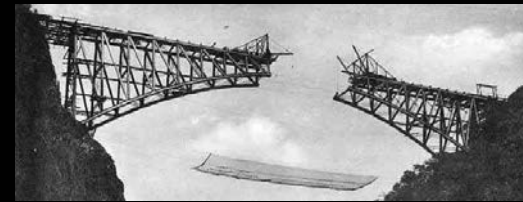
Carey Bissonnette (Chemistry)
carey.bissonnette@uwaterloo.ca



Wing-Ki Liu (Physics)
wkliu@uwaterloo.ca



Brewster Conant
(Earth Sciences)
bconantj@uwaterloo.ca



Title Slide Photo
Victoria Falls Bridge, Zimbabwe
<http://www.victoriafalls-guide.net/victoria-falls-bridge-construction.html>

