

Mathematics Education Forum

Statistics and Statistical Literacy

April 29, 2017, 10AM – 2PM
Fields Institute, 222 College Street, Toronto

10:00 AM – 10:05 AM Reports: OAME, OMCA, OCMA, CMESG, CMS, and other.

10:05 AM – 10:40 AM Dr. Milo Schield (Professor at Augsburg College, US Representative of the International Statistical Literacy Project)

Title: *Statistical Literacy: What is it; Who needs it; What is stopping it*

Description: Statistics is different from mathematics and statistical literacy is different from traditional research statistics and from Math for Liberal Arts. Statistical literacy is the ability to read and interpret the statistics in the everyday media, and in economic, social and political reports and studies. As a language literacy—ordinary English is central. As a quantitative rhetoric—strength of argument is central. Context and confounding are at least as important as randomness and bias. Causation is at least as important as prediction. Observational studies are at least as important as randomized clinical trials. Statistical literacy for consumers is needed by the 40% of college grads who are in non-quantitative majors; statistical literacy for decision makers is needed by the 45% of college graduates in non-STEM quantitative majors such as management, marketing, sociology and social work. The timing is right. Statistical educators are on board: the 2016 update to the American Statistical Association Guidelines opens the door for offering statistical literacy. Students are on board: 60 per cent agreed or strongly agreed that statistical literacy should be required by all students for graduation. So, what is needed? Support! Support from mathematics faculty; support in colleges and support in schools.

Bio: Dr. Milo Schield is a tenured professor at Augsburg College in Minneapolis. He is the US Representative of the International Statistical Literacy project, an elected member of the International Statistical Institute, the Vice-President of the National Numeracy Network. He has given 37 talks on statistical literacy in 18 countries outside the US on six continents. His critical-thinking approach to statistical literacy is unique. He is the webmaster of www.StatLit.org. His statistical literacy website had 280,000 visitors in 2016 with 470,000 downloads. His 70+ papers have over 600 citations and are hosted on ResearchGate.

10:40 AM – 11:15 AM Dr. Ruth Childs (OISE)

Title: *Why and how should teachers learn statistics?*

Description: Teachers need content knowledge, pedagogical knowledge, and pedagogical content knowledge (knowledge of how to teach their specific subject effectively), but must they also have knowledge of statistics? This presentation will explore teachers' and educational researchers' attitudes toward statistics, the opportunities teachers have to learn statistics, and how they are expected to use statistics. The role of statistical knowledge in the interpretation of large-scale test results, such as those from the EQAO tests, will also be discussed.

Bio: Ruth Childs is a professor at the Ontario Institute for Studies in Education, University of Toronto, where she teaches courses in research design, research methods, measurement and evaluation. Her most recent large research projects have investigated how elementary students deal with uncertainty when answering multiple-choice questions, the effects of admission criteria, and what Ontario's universities are doing to improve access for underrepresented groups. She was recently named the Ontario Research Chair in Postsecondary Education Policy and Measurement, to begin July 1, 2017.

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11:15 AM – 11:40 AM Dr. Barnabas C. Emenogu (Student Achievement Officer, Ministry of Education)

Title: Statistics at work and school; shaping relationships using data and analytics

Bio: Barnabas is currently Student Achievement Officer, Research, Evaluation and Data Management (RED team), in the Research, Evaluation and Capacity Building Branch (RECBB), Student Achievement Division, Ontario Ministry of Education. He was until recently Manager, Data Analytics at the Education Statistics and Analysis Branch (ESAB), Ministry of Education and formerly Senior Research Coordinator in The Literacy and Numeracy Secretariat (LNS). In these positions he has been responsible for using data to evaluate effectiveness of ministry programs, leading data analysis to provide report and advice to senior leadership for policy and program development and for priority setting and budgetary allocations. He has also been responsible for developing protocols for requesting bid proposals, evaluating such bids and recommending bidders for government research, evaluation or knowledge mobilization contracts. In all of these he has relied on extensive use of data and analytics in a variety of different ways.

He was a former Principal Lecturer of Research, Measurement & Evaluation and Statistics courses at both undergraduate and graduate studies in Education. He started his career in education as high school mathematics teacher at which time he also became a mathematics examiner for the West African Examination Council (WAEC)-a body that conducts exit and certificate examinations such as General Certificate in Education (GCE) and West African School Certificate (WASC) exams for students at the end of high school in the English speaking West African nations.

Barnabas holds a Ph.D. degree of the University of Toronto focusing on measurement and evaluation, statistics and psychometrics and has presented at many academic conferences including the American Educational Research Association (AERA), National Council on Measurement in Education (NCME), Canadian Society for the Study of Education (CSSE), International Congress for School Effectiveness and Improvement (ICSEI) and several overseas conferences. He has articles in refereed journals, monographs, book chapters and is the author of Educational Assessment: Principles and Practice.

Outside work and the academia, he is a community leader, a Christian evangelist and an advocate for social justice and educational empowerment of marginalized/less privilege youth in our community. He is a married father of three adults and one teenager.

11:40 AM – 12:00 AM Justin Detlor (Canadian Tire Bank)

Title: Careers in Statistics: A review of one analyst's journey

Description: The talk will focus on the career path of Justin Detlor, Manager of Sports Analytics at Canadian Tire Bank. Beginning with relevant course work in University, the talk will discuss different roles, skillsets and software used along the path. Review of current Sports Analytics work will be presented with practical examples provided. To conclude the talk, general thoughts on required skills needed in the private sector work environment will be addressed.

Bios: Justin Detlor is manager of Sports Analytics at Canadian Tire Bank. He oversees the development and implementation of new analytical methodologies to assist Own the Podium and Sport organizations in making data-driven decisions. Justin joined Canadian Tire Bank as a Senior Analyst in 2011. Prior to joining Canadian Tire Bank, he spent three years as a biostatistician in the pharmaceutical industry, focusing on the statistics of clinical trial design. Justin began his career in the finance industry, joining compliance and internal auditing with Wells Fargo Financial Canada. Justin holds a Master's degree in Statistics from University of Guelph.

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12:00 PM – 1:00 PM LUNCH BREAK (Light refreshments provided)

1:00 PM -2:00 PM Panel Discussion (involving two teachers, the morning presenters, and the discussion with audience)

Joanna Chaktsiris (Glad Park Public School)

Title: Data Management in the Early Years (Kindergarten/Grade 1).

Description: Joanna will discuss curriculum expectations, tasks for students, and noted problems that students and educators have in teaching/learning about statistics.

Bio: Joanna Chaktsiris is an Ontario Certified Teacher. She is currently teaching Grade 1 with the York Region District School Board and has had experience teaching Kindergarten and Grade 7 and 8. She has recently completed her Primary/Junior Mathematics Specialist. Joanna has supported the professional development of teachers by facilitating workshops and developing Mathematics curriculum tasks in her board. Her passion in Mathematics is based on inquiry learning where all students are able to find entry points into the rich world of Mathematics learning.

Paul Alves (Department Head of Mathematics, Fletcher's Meadow SS, Peel District School Board)

Title: Data Management in the Secondary Classes.

Description: I frequently tell my students in Data Management that they are required to have the Grade 11 University/College credit as a prerequisite for the course but that there is almost nothing from that course that they NEED to take Data Management. The course exists as an island in the secondary math curriculum but it is far from lonely on the island. There is so much to explore and so many connections that students can make with the world around them. But there is a frustration that exists as students aren't prepared for the level of critical thinking and analysis necessary to engage with many of the expectations in the course. This frustration stems from the perception that exists of this course among students and teachers.

Bio: Paul has been teaching for over 20 years and is currently the department head of math at Fletcher's Meadow Secondary School in Brampton. He has been a department head at two other schools as well as a resource teacher with the Peel District School Board. Paul has presented at conferences as a workshop presenters and keynote speaker including the OAME Provincial Conference, the OCMA conference and the T3 International Conference. Paul has served on the board and executive for OAME and was president of OAME during the 2015-16 school year.

2:00 PM ADJOURNMENT