NOMINATION

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Association of Atlantic Universities
Distinguished Teaching Award, 2017
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1. Nomination Letter
April 25, 2017

Association of Atlantic Universities
Suite 403, 5657 Spring Garden Road
Halifax, NS B3J 3R4

Dear Members of the Selection Committee:

Re: Nomination of Dr. Danny Dyer – AAU Distinguished Teaching Award

On behalf of Memorial University, it is my pleasure to nominate Dr. Danny Dyer for a 2017 Association of Atlantic Universities’ Distinguished Teaching Award. Dr. Dyer began his tenure at Memorial in 2005 and since that time has proven himself a thoughtful and dedicated pedagogue, a supportive colleague, and a generous ambassador for Memorial. Dr. Dyer’s skill and accomplishments in teaching and learning were acknowledged in 2015 when he was chosen the inaugural Chair in Teaching and Learning for the Faculty of Science and in 2016 when he was bestowed the President’s Award for Distinguished Teaching.

Dr. Dyer has a particular interest in the experience of first-year students. He regularly requests Math 1000, a first-year calculus course with an average enrolment of 100 students, as part of his fall teaching assignment. In addition, he has been a major contributor to our First Year Success Program, serving on its advisory committee, chairing a working group on math supports, and contributing to one of its core courses, University 1020. In an article he contributed to 2016 White Paper on making Memorial “student-ready”, Dr. Dyer reflected on his experience as a member of the First Year Success team and explained how it had forced him to take a hard look at his own teaching. Acknowledging a moral obligation to support students and provide them with a reasonable chance of success, he began to make major changes to the way he taught mathematics, particularly in the first year, and he encourages his colleagues to follow suit.

In keeping with his philosophy that one learns math by doing it, in 2013, Dr. Dyer participated in Project Engage in Teaching in which he chose to redesign Math 1000 from the typical math lecture course to one that employs a flipped classroom approach. This transformation required Dr. Dyer to develop a number of learning resources to allow class time for students to engage with each other and him as they practiced problem-solving. He shared this experience in a presentation at the Canadian Mathematical Society Summer meeting in 2015. As the course coordinator, Dr. Dyer has also mentored junior colleagues and aligned teaching and learning expectations, and marking schemes for all sections.

Following the success of this redesigned course, Dr. Dyer tackled the redesign of our on-line versions of Math 1000 and 1090. He brought together a team of math instructors from all three campuses of Memorial. Beginning with Math 1000, the team undertook the development of a series of videos in which students could learn from seeing math being done. These videos have become a resource for all instructors of Math 1000 and the over 1,400 students who take this course each year. A successful Teaching and Learning Fund grant application in 2016 resulted in $41,000 for the development of an online system for assignments in first-year math which will be piloted in Math 1090. Rebecca Milley, a team member from the Grenfell campus wrote the following in support of his nomination for the President’s Award for Distinguished Teaching: “Dr. Dyer spearheaded this project and throughout the process it is evident that his motivation is always, at the core, successful student learning. He achieves this goal with exceptional insight into how students learn mathematics, and with innovative, practical ideas for how to maximize that learning, all the while maintaining very high standards for student proficiency.”
Not one to shy away from teaching challenging courses, Dr. Dyer also teaches a course on technical writing, a course in which math majors are first exposed to mathematical research and report writing. A component of the evaluation for this course is an interview in which students must orally explain the results of their research. This is but one of his unconventional approaches to evaluation in math courses which encourage students to go beyond mechanics to develop an appreciation for the “big ideas”.

Dr. Dyer’s effective mentorship and supervision of undergraduate and graduate students are well recognized and appreciated. A goal for students in both these groups is the development of the communication skills necessary for academic presentations and publications. To this end, Dr. Dyer initiated the Summer Undergraduate Research Forum and has co-authored 12 papers with students, including two undergraduate students. Working with colleagues, Dr. Dyer successfully submitted a proposal to the 2015 Teaching and Learning Fund for $15,000 to establish the Graduate Program in Mathematics and Statistics Teaching which he coordinates and co-facilitates. The results of their investigation into what graduate students needed in such a program will be presented at the June 2017 Society for Teaching and Learning in Higher Education conference.

As the Chair in Teaching and Learning for the Faculty of Science, Dr. Dyer has had the opportunity to enhance teaching and learning beyond the Department of Mathematics and Statistics. Last year, he and a colleague in the Department of Psychology organized an off-campus retreat on teaching and learning for all those who teach in the Faculty of Science. The retreat was very successful and there is interest in making it an annual event. It has spurred Dr. Dyer and his colleague to partner with a teaching consultant from the Centre for Innovation in Teaching and Learning to organize a regular lunchtime seminar series. In an interview for the Gazette, Memorial’s official news site, Dr. Dyer said, “Ultimately, if we would like to see things change, we need to change them…. My hope is through events like this we can increase the spotlight on teaching and support people who want to further develop their own teaching.” As one of 13 chairs in Teaching and Learning, Dr. Dyer has helped organize and will help facilitate a University-wide retreat on transformational teaching later this month. To further the recognition of teaching excellence, Dr. Dyer has also spear-headed nominations for colleagues for faculty- and university-level teaching awards.

Finally, Dr. Dyer spends significant time and energy in outreach activities. Not only does he organize math competitions for high school students in the St. John’s region, he co-organizes them at the provincial level and sets the competition’s problems and solutions. Our Department of Mathematics and Statistics’ annual three-day Blundon Seminar and competition for high achieving high school math students could not take place without his commitment and hard work. Dr. Dyer has served on the national committee and acted as chief local organizer of Science Rendezvous, a science festival that exposes children of all ages to the wonders of science. Perhaps his greatest contribution is as the mathematics faculty member for SHAD Memorial, a position which, since 2006, has seen Dr. Dyer give up his Julys to befriend, mentor, teach, and supervise 56 of the brightest high school students from across Canada.

At Memorial, we value the many and varied contributions that Dr. Dyer has made to teaching and learning all of which stem from, as Dr. Chris Raford, head of the Department of Mathematics and Statistics puts it, “his passion for mathematics and an insatiable desire to share his curiosity about the world.” I have no doubt that Dr. Danny Dyer is a deserving candidate for the AAU Distinguished Teaching Award.

Sincerely,

Gary Kachanoski
President and Vice-Chancellor

c. Dr. N. Golfman, Provost and Vice-President (Academic)
2. Academic Career Achievements
Academic Appointments

- Chair in Teaching and Learning, Faculty of Science (2015–)
- Associate Professor (2011)
- Assistant Professor (2005)

Teaching Award: President’s Award for Distinguished Teaching, Memorial University (2016)

Courses Taught

- 13 courses; 37 course sections in total since 2005
- 3 significantly redesigned (On-campus: Math 1000. Calculus I; Online: Math 1000 and Math 1090. Algebra and Trigonometry)
- 1 new course developed (Math 6345. The Probabilistic Method)

Student Supervision

- 1 Postdoctoral fellow
- 2 Doctoral (jointly supervised)
- 3 Master’s (2 jointly supervised)
- 7 Undergraduate Honours
- 8 NSERC Undergraduate Research Awards
- 9 Memorial's Undergraduate Career Experience Program
- 1 SHAD Internship

Teaching and Learning Grants

1. $41,350, Online Assignments in First-year Mathematics Courses, Teaching and Learning Fund, Memorial (2016-18)
2. $2,500, Faculty of Science, Memorial—to supplement the operating budget for the Blundon Seminar, an annual three-day mathematics event for senior high school students (2016)
3. $15,000, Graduate Program in Mathematics Teaching, Teaching and Learning Fund, Memorial (2015-17)
4. $15,000, Teaching and Learning Framework, Memorial—to support professional development or activities associated with the Chair in Teaching and Learning (2015-17)
5. $1,500, Atlantic Association for Research in the Mathematical Sciences (AARMS)—to supplement the operating budget for the Blundon Seminar (2010)

Scholarship in Teaching

- Information Literacy in the Sciences: Targeting Graduate Students. Danny Dyer and Alison Ambi, at Conversations in Information Literacy, Memorial University, February 22, 2017
- Dyer, D. When knowing the wrong people might be the right thing: Committee work in FYS. In Making Memorial Student Ready: Reflections on the First Year Experience, edited by V. Burton, Memorial University, 2016, pp. 39-42.
- How I spent my Fall semester: Experiences with active learning in Calculus I. Danny Dyer at Canadian Mathematical Society summer meeting, University of Prince Edward Island, June 2015.

Teaching Development

I have attended 11 teaching development workshops at Memorial which included topics related to the institution's learning management system, teaching large classes, problem-based learning, and plagiarism. The following are two in-depth teaching development programs in which I participated:
Teaching Skills Enhancement Program  (January-April, 2015)
Project Engage in Teaching (September 2013-August 2014)

University Service (University–13; Departmental–9; National–1)
My service on committees includes the following teaching-related committees:

- Senate Committee on Teaching and Learning (2017–)
- Memorial University NSERC USRA Selection Committee (2017–)
- First Year Success Advisory Committee (2012–)
- Science Rendezvous National Science Festival Steering Committee (2012-15)
- Math Supports Working Group, chair (2011-12)
- Support for Students with Academic Challenges Advisory Group, Teaching and Learning Framework (2011)
- Undergraduate Studies Committee, Department of Mathematics and Statistics (2010-14)
- High School Competitions Committee, Department of Mathematics and Statistics (2008–)
- Graduate Studies Committee, Department of Mathematics and Statistics (2007-08, 2010-11)
- Faculty of Science Library Committee (2005-12, chair 2005-08)

Other teaching-related service includes the following:

- Transformational Teaching and Learning Retreat, co-organizer and facilitator (2017)
- Teaching and Learning Brown Bag Lunch Series, organizing committee member (2016–)
- Faculty of Science Teaching Retreat, co-organizer (2016)
- Junior High Math League, co-organizer (2014–)
- Senior High Math League, co-organizer (2013-15)
- Science Rendezvous, chief local organizer (2012-15)
- Summer Undergraduate Research Forum, founder and organizer (2008–)
- Blundon Seminar, co-organizer and lecturer (2007–)
- SHAD Memorial, mathematics faculty member (2006–)
- High School Student Interviews, Academic Advising Centre, interviewer (2005-10, 2016)
- Math/Science in the Mall, co-organizer and demonstrator (2005-06)

RESEARCH

As a faculty member in the Department of Mathematics and Statistics I am expected to maintain a consistent and progressing research agenda. My area of specialization is combinatorics.

Research Grants
1. $11,000/year NSERC Discovery (2015-2020)
2. $24,000 AARMS Collaborative Research Group (2013-15)
3. $20,000 Faculty of Science Award (2013-14)
4. $5,000 AARMS (2009)
5. $7,000/year NSERC Discovery (2006-10)

Refereed Publications: 26, including 12 co-authored with students, 2 of whom are undergraduates

Scholarly Lectures: 35 (local, national, and international)
3. Teaching Philosophy
The fundamentals of my teaching philosophy are pretty simple: I believe that you learn by doing. This idea is deeply rooted both in how I do mathematics, and how people around me do mathematics. In mathematics, as in any subject, there is a certain “core” knowledge that must be assimilated, but even that knowledge is frequently learned through its use. This is hardly a new idea, of course. Aristotle knew it, and his *Nicomachean Ethics* perfectly captures the paradox of having to do something to learn it, “for the things we have to learn before we can do them, we learn by doing them.” Teachers at all levels of mathematics education know it too. Children learn how to multiply by multiplying; how to add fractions by adding them. In university, they learn to calculate limits by calculating them. I’m not being facile here, though these seem like tautologies. In my research, I frequently prove existential results concerning combinatorial designs by constructing the designs. I prove that inequalities may be strict by constructing a graph that demonstrates that they are unequal.

The tautology above doesn’t really help us understand what’s at the center of it all. And, that center really is understanding. The ratio of work (or drill) to understanding varies, but both are necessary. Reading about playing the piano may increase my understanding of the physical piano, and even give me an appreciation for the difficulty of a piece—but it won’t teach me how to play the piano. That I can only learn by sitting down at the bench and playing.

Students often don’t understand the relationship between practice and understanding. Many of us hear the refrain, “I understand it when you talk about it in class, but on the test...” A colleague of mine refers to this as *entertainment teaching*: the student is entertained in class, and content. This is useful—it makes students want to attend, and even to pay attention. I think that as a teacher, I’m obliged to try to be entertaining. Not for its own sake, but to try to make my students as receptive as possible. However, while it may make the student receptive, this approach doesn’t necessarily equate to a student learning. And that’s what the “but on the test...” students have missed.

Some students need to have things explained to them once, after which they see to the core concepts. But that isn’t the norm at the level of mathematics I normally teach at, even for the best students. So, frequently, things get explained many times. Generally, this isn’t enough either—talking about mathematics isn’t sufficient to internalize mathematics. And so, we turn to practice. In low-level courses, we traditionally generate this practice through assignments of varying kinds, followed by time-constrained tests, before leading up to a major piece of evaluation. However, even at this level my colleagues and I recognize that this isn’t enough. Our assignments are there to point the way to a student’s weaknesses—to inform the student what they don’t know, or know imperfectly, in a “low stakes” situation, before a “high stakes” piece of final evaluation. At higher levels, even at the graduate level, we play much the same game, but with the assumption that students will fill in more of the blanks. It’s not that large amounts of practice aren’t necessary—it’s that they are assumed. Mathematicians can’t conceive of learning without practice.

I didn’t understand this as an undergraduate. When I was in my first year, I almost flunked Calculus II. It shook me up. I talked to a lot of people, including my professors. The professors understood my shock. One said to me that “everyone gets to a point, in any subject, where the material is too complicated to be held in your head.” I was lucky enough to realize the solution: practice. I started working through all the integration problems in my text. Eventually, I could look at a problem, and wouldn’t need to think about it. I could just see how to do it. I wouldn’t know the answer, but I’d know how to get to the answer. I had enough mastery of the subject that some of it became innate, thoughtless. I had developed intuition.
I sometimes had to re-learn this lesson. In my first highly theoretical “proof” course, I frequently felt completely lost. I remember getting a definition wrong on a midterm. Instead of phrasing a clause as “if... then...”, I had used “and”. At the time, I was mystified. Now, I’m embarrassed. I know the difference between implication and conjunction. And I learned an important lesson: I had to memorize certain basics before I could understand them. As I progressed, I realized that at any level of mathematics this technique is relevant. It’s normal to memorize entire proofs before obtaining sufficient understanding to comprehend their important aspects. I frequently have students who fall into the same trap I did, telling me they understand things, but subsequently cannot accurately define them. Memorization, drill even, is a dull form of practice, but a critical one.

This is not a popular option with some students. Many, for the first time, have hit a level of complexity in one of my courses that they cannot hold all the ideas in their heads. It is not uncommon for students to tell me that they spend hours studying, made up of re-reading class assignments. But this is missing the point—they may be engaging their recall, but they are not building or reinforcing connections. They are just reading mathematics, instead of doing it.

Before a test or an exam—in a help session; in my office hours—I tell my students the same critical piece of advice: practice. That means doing a few hundred extra problems. It means learning definitions by rote, and memorizing complicated proofs. And, after all that, it hopefully lets them learn something. In the worst cases, not enough. In better cases, they learn new mechanics, new rules to manipulate expressions. In the best cases, after employing it long enough, they finally see the meaning in a definition; a piece of truth; a glimpse of the Platonic realm. My obligations as a teacher are to do what I can to make these glimpses possible.
4. Evidence of Excellence in Teaching
Teaching Responsibility

My teaching ranges from first-year courses with as many as 160 students to senior undergraduate courses with as few as one student. Both can be satisfying for different reasons. The junior courses are filled almost exclusively with non-majors, many of whom will admit to me they hate mathematics. Here, my challenge is to motivate students to embrace a course they may dislike (or even resent) without lowering course expectations. In the senior courses, where it’s safe to assume students enjoy the material more, I must help them develop a mathematical maturity to grapple with the esoteric nature of higher mathematics. My teaching at the graduate level is through reading courses to students interested in combinatorics, my area of research. What follows is a description of two undergraduate courses in which I’ve put significant effort to improve student engagement and learning.

Math 1000. Calculus I

My recent teaching revolves around this course, which is the first mathematics course that’s required for most Science, Pharmacy, and Engineering students and for all Business and Kinesiology students. It’s normally a lecture course given in an F-slot, meaning an extra contact hour per week (though no extra teaching credit). Class enrolment is typically between 80 and 160 students. In our department, few tenured (or even tenure-track) faculty teach this course, or any other courses at the first-year level. However, I request it every Fall semester as it’s critical to our own majors, as well as many others in the University. It’s a challenging course and many students struggle with it. As such, I’ve spent more time on my teaching of and developing materials for this course than any other.

In the 2013-14 academic year I participated in Project Engage in Teaching, a project designed to assist instructors with redesigning a course using research-informed teaching strategies to improve student engagement. I had taken Ben Wyatt’s “Flipping the Classroom” webinar offered by Wiley and as part of Project Engage, periodically had an observer tracking my students’ level of engagement. My philosophy of doing mathematics lead to a redesign of Math 1000 that uses a semi-flipped classroom approach (“semi” as I still give short lectures). I wanted to give my students time to work on math problems during class while I could serve as a problem-solving resource, not just a talking head. I could address my students’ issues, rather than tell them what I thought their issues would be. To this end, I created a number of resources to enable me to add new elements to a course for which I normally lectured four times a week, started with a full lecture on day one, and finished my last topic on the last day of class.

To begin, I created a collection of “fill in the blank” notes. I realized that large amounts of time were lost to writing down definitions, posed questions, and notation. Even writing down the setup of examples was dead time when no one was learning. Students now come to class with these notes printed or available digitally. Some students just listen, some follow along and complete their notes as I fill in the blanks—going over definitions, posing questions, demonstrating notation, and writing out key examples. Once notes are completed in this manner, they are scanned and made available to students. While this method of note-taking saved time (and allowed students to check the accuracy of their notes and provided students who were absent a chance to catch up) it didn’t save enough to give students unstructured time to work on the problems at their own pace. So, I’ve slashed and burned my notes. For every topic, I created worksheets with problem sets drawn from my old lecture notes and those demonstrated in class. Now, I demonstrate one problem (maybe two), and then turn the students lose. I circulate through the classroom, along with a TA, and respond to questions. When
I don’t get questions, I ask them—I approach students and ask what problem they’re doing, if they’re getting the right answers, or if there’s something they’re missing.

I provide answers with the problem sets but not complete worked solutions. Instead, every problem is posted as a video of me working the complete solution. I’ve created almost 100 videos (over 8 hours) which serve two purposes: first, students get to see worked examples of as many problems as they desire, as often as they desire; second, students who are absent get to see active explanations of problems, rather than static solutions. I reported on the course redesign and outcomes in a talk entitled How I spent my fall semester: Experiences with active learning in Calculus I which I presented at the Canadian Mathematical Society’s Summer Meeting in June 2015. The below comment from the first semester that I taught the redesigned course reflects its success:

The best aspect of this course was the overall organization of how the course was laid out. The extra useful videos found on D2L helped very much when it came to studying or trying to understand a topic you did not fully understand in class. The notes that Dr. Dyer provided prior to class was very helpful. Instead of students struggling to write down everything extra Dr. Dyer said, do problems and try to catch up with notes there was blank space provided solely for problem solving, and the additional help of the T.A. and time in class to actually work on problems was the best method of teaching I have seen in university. (CEQ, Fall 2014)

In addition to teaching Math 1000, I also serve as the Course Coordinator. As many of the instructors are not only new to the course, but new to teaching (being graduate students or post-doctoral fellows), I mentor them and monitor their progress through the semester. I’m also responsible for building policy for the course on a consensus basis, as well as drafting the final exam and organizing panel marking. When I assumed the position, I mandated in-person meetings to cooperatively design the final exam and set marking schemes. I also reinstated panel marking to ensure that all students in all sections are marked equitably and to increase instructor confidence in the marking process. A secondary effect is that all sections of Math 1000 are now more closely aligned in their expectations, which is essential, as this is a “gatekeeper” course for many departments and faculties and will often have an impact on scholarship standing. The course coordinator position carries no course remission, and ultimately deals with approximately 750 undergraduate students per year.

Math 2130. Technical Writing in Mathematics

For mathematics, this course is very non-traditional in its delivery, methodology, and evaluation, and as such, faculty are often reluctant to teach it. It’s required for all math majors and enrolment is capped at 16 students. It’s the first course in mathematical research; students independently explore mathematics and then attempt to communicate their ideas. While it begins with some traditional lectures, it’s really a project-based laboratory course where I’m consulted directly by students as they work on the four projects which make up their evaluation. Due to its importance in our program, when I teach this course, I regularly create new projects to interest and engage students. One I’m particularly proud of is “Grey Elephants Don’t Live in Denmark”. The titles refers to a common trick involving “casting out nines”—though little more than arithmetic, it serves to catch students’ attention. This project requires students dig deeply into a branch of number theory that’s critical to almost every method of modern encryption, and hence to national and personal security, and finance. Students normally end up writing a computer program to establish an experimental base for their beliefs before proving the theoretical results.

Students in this course struggle with time management and with writing the 10- to 15-page research reports required roughly every three weeks. In 2008, I brought together a team of two other faculty
and two undergraduates (who had previously completed the course) to revised the course manual making expectations and instructions clearer, and providing more useful examples. We also introduced a series of graded milestones to encourage students to break down projects into manageable pieces and complete them in a timely fashion. The 2008 version has been updated and is still in use today.

As well as the research reports (upon which I comment heavily), part of the assessment in Math 2130 is an interview. In these interviews, I often found students didn’t understand their own weaknesses, and that the same mistakes were repeated in project after project. To maximize the learning value of the interviews, I created a Project Assessment Sheet that’s filled out during our interview, so that students get a realistic estimate of their skills in a variety of areas.

The following quote illustrates my approach to teaching this course and the transformational effect it had on one particular student—I realize that this is the first opportunity for many of my students to do math and become mathematicians.

There are many professors at this University who are very knowledgeable but they are not good teachers—they have a difficult time communicating their knowledge and getting students excited about the material. Dr. Dyer is one of the best teachers I’ve had at Memorial. At times it was uncomfortable coming to class knowing that I’d have to discuss my paper (because discussing ideas and answering questions on the spot is a weakness of mine), but over the course of the semester it became more comfortable and the benefits outweighed my nervousness. Instead of waiting around for students to ask questions, Dr. Dyer took an active approach—be wandered around the class asking each student about their paper. Even if the students didn’t think they had any questions, lots of times very helpful information would come out of these discussions, I was thankful for this. I don’t know if I would have survived the course without Dr. Dyer’s instruction. (CEQ, Winter 2013)

Methods of Student Assessment

In mathematics, there are certain assessment norms that we adhere to and most of my assessments are quite typical for math courses of similar levels. However, I do have students undertake some unorthodox forms of assessment for my discipline.

- **Student Lecturers.** In my fourth year combinatorics class, Math 4340, I ask each student to pick a section of our text and prepare notes, a lecture, and a handout for that section. Students must study their topic independently, determining what’s important and what isn’t. Each student then meets with me before the class in which they are scheduled to speak with drafts of their handout and lecture. We review their work together and they incorporate whichever of my suggestions they see fit. After giving the lecture, we meet again and I assign students a grade based on a rubric provided in advance to guide their preparation. Besides requiring students to learn independently, this activity gives many math students their first practice in public speaking in university.

- **Group Assignments.** A weekly written assignment is common in most math courses, but I allow students to put up to four names on each. I have several motivations: first, math is a collaborative science, where mathematicians share ideas, argue about approaches, and hopefully, in the end, prove something; second, the temptation to plagiarize is reduced; and finally, the number of papers to be marked is often cut in half. While this might seem to simply be an administrative advantage, it benefits students, especially in first-year classes of 100-160, because it allows time for more detailed feedback to be given on all questions rather than just on selected exercises as is usually the practice.

- **Calculus Projects.** It’s tempting to reduce the calculus course to mechanical mathematics—the reproduction of particular methods for particular problems. However, as part of Project Engage,
I did a lot of thinking about the “big ideas” in this course. As a result, I decided to introduce short projects that asked questions related to course material but deal with those “big ideas”

- **Time-sensitive Assignments Online.** Our department uses WebAssign, an online homework tool in which students are given short assignments that they may repeatedly try until a “target” goal is reached. My variation shortens the time students have to complete their assignments. While this might seem counter-productive, it in fact facilitates learning. For example, after finishing the “Product Rule” on Monday, I release an eight-question WebAssign due on Wednesday. Students get two days to work on these questions until they correctly answer six of eight; having done so, they come to class on Wednesday with the previous material fresh and practiced and ready to tackle the “Quotient Rule” which will build and expand upon the Product Rule.

- **Resubmission of Midterm Question.** The below excerpt from the News widget on the D2L site for Math 1000 illustrates how I encourage students to use midterms as learning tools.

  ![Resubmission of one midterm question, for second midterm](image)

  **Student Supervision and Professional Development**

  I actively seek out and encourage undergraduate students to apply for research opportunities like the NSERC Undergraduate Student Research Award program. These awards enable students to become involved in all aspects of the research process. For some, this research experience may lead to an honours thesis. Through weekly meetings, students gain basic skills in preparing scholarly work, including some mastery of LaTeX, presentation skills, and time management. To foster communication skills I founded the **Summer Undergraduate Research Forum**, a mini-conference held each September to encourage students who pursued research in the summer to prepare 20-minute talks on their work. Many are subsequently given at the Science Atlantic Mathematics, Statistics, and Computer Science undergraduate conference.

  My graduate students are supervised by weekly meetings, where we work on developing critical thinking skills to evaluate the strength of their research as well as the ability to communicate research results orally. I expect graduate students to be able to prepare and give poster presentations and research talks, and attempt to provide them with the skills necessary to work in academia and in applied research. I am part of a group that received a grant of $15,000 from the Teaching and Learning Fund to develop a **Graduate Program in Mathematics and Statistics Teaching**. The program combines
training in teaching with other professional development workshops. The goal is to increase graduate student proficiency in teaching so that undergraduates will receive more thoughtful and informed interactions, and to make our graduate students more employable.

To identify their needs and desires, my colleagues and I ran focus groups with graduate students. We also surveyed our graduate students and faculty to determine what they felt were key topics to address. Though primarily for program development, some interesting differences showed up between the motivations of graduate students and what faculty members thought motivated graduate students. Particularly striking was data that showed that the students valued personal growth as highly as improving a CV; few faculty thought that graduate students valued personal growth. We will be presenting the results of our survey and the differences in expectation between these two groups at the 2017 Society for Teaching and Learning in Higher Education conference in June and are also preparing an article for publication.

In the Winter 2016 semester, we piloted two workshops—one in training markers for undergraduate courses, and another in training teaching assistants for our help centres. These workshops involved role-playing and group discussions to help graduate students (many of whom have English as a second language) better communicate with the instructors and students they will be working with. The program is now officially underway and we’ve offered workshops on applying for academic and industry jobs; information literacy; best teaching practices for mathematics and statistics; technology in teaching; and university policies on copyright, privacy, and sexual harassment.

**Course Development**

I recently chaired an ad hoc committee struck by our department head that was tasked with examining the high failure rates in recent classes of Math 1090 (our pre-calculus course for students not sufficiently prepared to enter our calculus stream directly). Students who enter Memorial having completed Academic Math in the current high school curriculum were not prepared for a traditional math classroom and had a particularly poor chance of succeeding in this course. When the Math Learning Centre, which offered our non-credit math courses, was closed due to budget cuts, the problem became particularly important. So, we looked at alternative delivery models to address the needs of this group. Our response was to create Math 109A/B, a linked course which will cover the same material as Math 1090, but over two semesters. Besides the slower pace, instructors will deal with half the enrolment of the traditional 1090 course. They will spend more time on in-class problem solving and will be backed up by a teaching assistant in the classroom and for grading. These changes were recently approved by university Senate and will be implemented in Fall 2017.

In addition to the creation of Math 109A/B, the redesign of Math 1000, and the development of a graduate course in *Combinatorics and the Probabilistic Method*, I collaborated in the redesign of the online versions of Math 1000 and Math 1090. After my successful re-vamping of Math 1000, I assembled a redesign team of instructors from each of our three campuses who teach these, or similar courses, and who were interested in making changes. Originally developed by a retired faculty member of the Department of Mathematics and Statistics, these courses had a high failure rate. Students were given a text to read and worksheets for practice then asked to complete several assignments, a midterm, and a final exam. There was little or no engagement between the instructor and students; not a method of delivery that any instructor currently teaching calculus would embrace. And mathematicians agree, it’s very difficult to read mathematics independently.
Starting with Math 1000, we created a set of approximately 70 instructional videos paired with a short quiz which would test students’ basic understanding. More complicated “practice problem” videos were then created to more fully demonstrate the range of problems that might be asked. In total, these practice problem videos added another 300 problems. Thus, students get something much closer to a classroom experience and have much greater scaffolding than simply being asked to read the text and prepare solutions. The videos prepared for this course are available to all instructors and students of Math 1000. Feedback has been positive and the failure rate in Winter 2015 fell to 36% from 44% and 51% in the previous two Winter semesters. Work continues with the same group on designing similar set of resources and delivery mechanism for the online version of Math 1090. It’s in this course that the assignment software we are developing with grant money from the Teaching and Learning Fund will be piloted in Spring 2017.

Teaching Leadership

I successfully participated in a competitive process to determine the Faculty of Science Chair in Teaching and Learning. As part of the Teaching and Learning Framework, a chair was created in each faculty and school to “to enhance the student learning experience by promoting the development of innovative pedagogical approaches, teaching capacity and competence across the university, within academic and support units, and at the level of individual faculty members.” I would like to raise the profile of teaching in our Faculty, to celebrate its excellent teachers, and to encourage all of my colleagues throughout the university to be considered in their teaching. Two initiatives are described below:

- **Teaching Retreats and Seminars.** In 2016, along with a faculty member in the Department of Psychology and the Manager of Teaching and Learning, and using funds from my stipend as chair, I co-organized a Faculty of Science Teaching and Learning Retreat. This was a first of its kind for our Faculty, and a big success. We had 31 participants who gathered to share their teaching experiences, trade tips and tricks, and help chart a future course for teaching in the Faculty of Science. There is interest in making it an annual event and has resulted in a series of lunchtime seminars which I co-organize and facilitate with two other colleagues. To date, six seminars have been organized dealing with topics such as preventing plagiarism, writing courses in the sciences, increasing student engagement, and understanding who our students are. The retreat and seminar series are excellent professional development opportunities and foster a community of teaching and learning in the Faculty of Science. Working with the 12 other Chairs in Teaching and Learning, I helped organize and provided the closing session for a university-wide Transformational Teaching and Learning Day that took place at the end of April this year.

- **Teaching Awards.** I’ve worked with my department head to streamline and re-invigorate the currently defunct student-driven teaching award and I regularly encourage students to identify and nominate worthy instructors for the Faculty-level award. I’ve also spearheaded three nominations of colleagues in my department for the President’s Award for Outstanding Teaching.

**First Year Success Program.** I serve on the First Year Success Advisory Committee. This committee provides guidance to the academic and administrative directors of an enriched experience program for students entering university for the first time with an admission average under 75%. Associated with this initiative, I chaired the Math Supports Working Group (2011-12) which was formed to address challenges to students in first-year math. One of the accomplishments of this group was the creation of The Tutorium, a second math help centre located in the library. More directly, I’ve also been involved as part of the teaching team for University 1020, one of the required courses of the FYS program. Asked by the academic director to try to impart a critical idea to the class, students and
I talked about the importance of practice, and that expertise is not inborn, but developed through repetition. I also participated in the final “Grand Plenary”, a discussion between the teaching team and students based on questions the students formulated in advance. In an unsolicited letter to the head of my department, Dr. Valerie Burton, academic director of the program wrote…

In the course of 75 minutes Dr. Dyer not only carried the point that practice is fundamental to reaching a certain level of problem solving, but also succeeded in legitimizing students’ extra-curricular interests. He left the students with the message that although university is an institution with structures and rules that students must follow, they can still “come as they are” and find a place for themselves. Dr. Dyer thus provided an opening for the affirmation that eludes some of these students when they enter university with the low high school grades that intimate academic work will be a struggle… The qualities that make Dr. Dyer a highly effective teacher are also the qualities to be appreciated in a committee member and colleague. The FYS Advisory Committee has benefited on many occasions from his good advice delivered in a generous and open spirit.

Scientific Outreach

At the Junior High level, I co-organize the Junior Math League, a biannual mathematics competition for students throughout the province. In addition to preparing problem and solution sets for provincial distribution through the province, I also administer the competitions for the St. John's region to 50-80 students. At the high school level, I’ve been heavily involved with the departmental Blundon Seminar and competition since 2007. This annual three-day event is by invitation-only to high-achieving math students in the province. In the past five years, I’ve been involved with setting the competition and organizing marking, organizing and marking problem sets, and presenting selected problems based on students’ performance. I appreciate the opportunity to encourage these students and help them develop problem-solving skills that they can use in future competitions or at university. The Blundon Seminar has hosted several Rhodes Scholars, a professional poker player whose current winning surpass $12 M, and the only Newfoundlander to win an Academy Award (for his mathematical work with special effects)!

While I once held a position on the Science Rendezvous National Steering Committee and served as Chief Local Organizer, my recent efforts for this national science festival have been in organizing the involvement of the Department of Mathematics and Statistics and acting as a resource for the new Chief Local Organizer. When I served in that role, I recruited new participants to our local event, including: the Department of Physics and Physical Oceanography; Ocean Sciences; Let’s Talk Science; and SHAD’s Newfoundland and Labrador program manager, which enabled us to tap into that program’s resources. Science Rendezvous increases the profile of science nationally and provincially and exposes children of all ages to some of the most fun aspects of science, showing them that science is something they can do. We estimate that our most recent event had almost 600 participants, including almost 400 children, and more than 60 volunteers from throughout the Faculty of Science.

My biggest contribution to outreach is serving as the Mathematics Faculty Member for SHAD Memorial. SHAD is a national competitive-entry residential summer camp that specializes in STEM education. I’ve been involved with SHAD every year since 2006, which has me move into residence for the entire month of July to be “embedded” with 56 of the brightest high school students from across Canada. I spend 24 hours a day with the students—giving lectures and workshops about various math topics, supervising extracurricular activities, sharing meals, and organizing field trips. This event is exhausting, both physically and mentally, but extremely rewarding. It is a privilege to talk to these students, who overflow with enthusiasm, and lap up all the knowledge and experiences we can offer.
5. Student Ratings of Instruction
The Centre for Institutional Analysis and Planning (CIAP) administers Memorial’s mandatory Course Evaluation Questionnaire (CEQ). It is administered online through Student Self-service in the last two weeks of the semester. Data is summarized by CIAP and, after final grades have been submitted, reports are sent to instructors and academic unit heads. Two weeks later, reports are published for access by students on the Self-service web site.

The course load per academic year for faculty members in the Department of Mathematics and Statistics is three concurrently with student supervision. Because of accumulated credit for student supervision and course remissions as the Faculty of Science Chair in Teaching and Learning, I haven’t carried a full teaching load since the 2012-13 academic year. I’ve therefore reported on the most recent two consecutive years in which I’ve taught the most number and variety of courses.

### Table 1. Mean Scores on the Course Evaluation Questionnaire Global Questions

<table>
<thead>
<tr>
<th>Instructor Department</th>
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<th>Course</th>
<th>Enrol</th>
<th>Resp</th>
<th>Q. 7</th>
<th>Q. 13</th>
<th>Q. 7</th>
<th>Q. 13</th>
<th>Q. 7</th>
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<th>Q. 13</th>
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<td></td>
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<td></td>
<td>Math 3240. Applied Graph Theory</td>
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<td></td>
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<td></td>
<td>Math 4340. Combinatorial Analysis</td>
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</tbody>
</table>

Prepared by A. MacNeill-Hajek, Centre for Innovation in Teaching and Learning from reports prepared by the Centre for Institutional Analysis and Planning.

As you can see from this data, I’ve consistently done very well when rated on the overall quality of instruction, as well as on course organization. I am proud to have out-performed the Mathematics and Statistics departmental average on Q.7 in each semester under consideration, and I’ve frequently outperformed both departmental and university averages on both overall quality and overall organization.

Particularly pleasing is the increase from F2013 to F2014 for Math 1000, as Fall 2014 is when I premiered my re-designed version of Math 1000. Students appreciated the changes, as is made clear in their responses to Q.7 (3.88 to 4.59) and Q.13 (4.16 to 4.61). Detailed student feedback from the Fall 2014 offering is available in Appendix B. One recurrent theme that students gave as a criticism of the course was my use of short projects. I took this to heart; while I continue to use short projects, I’ve altered them to maintain the intellectual complexity, but to shorten the work involved. This was done in a variety of ways; sometimes by something as simple as requiring fewer decimal places to a solution, and sometimes by removing the written portion of an assignment and allowing students to submit a video instead.

I should also mention that F2014 was the first semester that I taught Math 4340. While I’m not displeased with students rating the organization between “Good” and “Very good”, I have subsequently requested and taught the course twice more to improve the overall quality of my course notes and design.
6. Letters of Support

1. Ms. Beth Ann Austin, Former student and Lecturer, Department of Mathematics and Statistics
2. Ms. Angela Beck, Former student
3. Dr. Ronald Haynes, Professor, Department of Mathematics and Statistics
4. Dr. Chris Radford, Professor and Head, Department of Mathematics and Statistics
April 16th, 2017

Dear Members of the Selection Committee,

It is my honour to write in support of the nomination of Dr. Danny Dyer for the Association of Atlantic Universities Distinguished Teaching Award. I have known Danny in many roles through the years — first as my professor, then as my supervisor, and most recently as my colleague. In each of these roles he has played an integral role in my growth, and changed the way I approach both mathematics and education.

I first met Danny in September 2007 while he was teaching a second year course in Technical Writing in Mathematics at Memorial University. At the time, math courses were just a stepping stone for me towards an education degree, but that course opened my eyes to what math can be. The projects we worked on throughout the course covered a range of topics and were open enough to allow individual exploration of the problems for those who wanted to go more in-depth with their work. The small size of the class and research focus of the course allowed for a lot of individual attention. Through discussions in class and individual meetings, Danny guided my work while allowing me to make discoveries on my own. More than this, he got to know his students as individuals and showed concern for us personally, not just for our marks. It was the first time that I felt that I mattered as a person, rather than just being another name on a class list.

My experience that semester led me to take a higher-level course with Danny the following term. Seeing him in a more formal lecture-based environment was of course a different experience, but his passion for the topic was clear and it was easy to stay engaged. Danny was animated in class, embedding his personality and humour into the problems we worked on. The class introduced the topic of combinatorics, which was quite new to me and different from most of the mathematics that I’d seen before. It focused on word problems and proofs rather than the formulas and calculations I was more used to. Despite the change, Danny made the course easy to approach. He clearly demonstrated multiple approaches to problems, showing how different proof techniques could be used to show a given result. More importantly, he was always open to questions. Whether in class or — for more timid students like myself — in office hours, Danny never hesitated to take the time needed to help us understand the course.

Even in the larger class, Danny remained a very approachable, caring professor. When he suggested that I apply for a student research position, I jumped at the opportunity and was thrilled by his offer to supervise me. During that summer and the two that followed, I worked with Danny doing research in graph theory and, with his guidance, laid the groundwork for what would become my Honours paper. He gave me a great deal of freedom to explore this new topic and choose the paths that interested me the most, but was always there to help along the way. He pushed me to improve my research and work to my full potential. I learned to write in the language of mathematics and refine my proofs to be rigorous. Throughout this time, Danny also introduced me to other mathematicians he was collaborating with and included me in their discussions, encouraging me to contribute. These first steps into the mathematical community prepared me to move on to my Masters degree and, ultimately, to teaching.
When I returned to the math department at Memorial, it was as a lecturer. Again, Danny was there to help me along the way with resources, answers to questions, and moral support. The transition from student to colleague was easy, as the personal connection was already well established from his care in the past. He remains the first place I turn when I’m in need of guidance or a second opinion. Danny’s devotion to the craft of teaching is clear through his work as a Chair in Teaching and Learning and his continuing efforts to try new things in his own classes. He puts himself forward as an advocate for changes that will benefit students, most recently as the chair of a committee adapting a course to help students who struggle with the usual introductory algebra course.

Danny continues to experiment in the classroom, trying new methods in the hopes of helping students. He regularly teaches larger first year classes, which of course necessitate different approaches to those in upper year or graduate courses. To accommodate this, Danny has experimented with a flipped classroom – having students actively work problems in class rather than passively listening to lecture. This venture led him to explore other innovations to cover more of the material that he would have previously done during that class time. He makes use of technology to record more examples to share with his classes, and to explain topics in depth when needed. The flipped classroom approach also allows for a more personal touch with students, as it gives the time to interact with smaller groups in class. Through new approaches, Danny continues to make the connections that I saw as an undergraduate, and that brought me to my love of mathematics.

His influence has certainly changed my own approaches as well. Through him, I’ve made connections to the teaching and learning community at Memorial and become involved with the First Year Success program – a program dedicated to helping students adjust to the university experience in their first year. His willingness, indeed eagerness, to include sessional instructors such as myself in departmental discussions and projects makes me feel valued in the department and gives me the support I need to bring forward my ideas. In personal discussions, we often exchange ideas and troubleshoot new strategies for courses. He encourages me to try new approaches and follows up with me to see how they are working out.

I can say without hesitation that I would not be where I am today without Danny’s guidance and unwavering support. As I continue in my own journey of mathematics education, I can only hope to inspire students in the way that he has done for me.

Sincerely,

Beth Ann Austin
Lecturer, Department of Mathematics and Statistics
Memorial University
Members of the Selection Committee for the AAU Distinguished Teaching Award,

I am writing this letter in support of Dr. Danny Dyer who has been nominated for this award. I am a former student of Dr. Dyer’s and I graduated from Memorial University of Newfoundland in 2009 with a Bachelor of Arts degree, majoring in Pure Mathematics.

The first course I took with Dr. Dyer was AMAT 2130, Technical Report Writing in Mathematics. This was a project based course for which we were given various problems, asked to research these problems, and to write a report to present our findings. I quickly discovered that Dr. Dyer was not going to be type of professor to go easy on his students. On the first project I received a grade of 68%, not exactly a grade I was used to getting. Luckily, Dr. Dyer was also someone to recognize the potential in a student and motivated them to learn from mistakes and do better. He had this amazing ability to make his students want to do better, rather than to make them feel discouraged by a lower grade. He wanted his students to earn their grades and gain a greater appreciation for the work they were doing. Personally, I enjoyed the course far more than I anticipated because of Dr. Dyer’s challenging nature.

The following semester I had Dr. Dyer for PMAT 3340, Introduction to Combinatorics. This course was a lecture based course with a much larger class size than AMAT 2130. The number of students was of no issue to Dr. Dyer as he had the ability to quickly command the attention of his students with his upbeat and quirky personality. He was always very enthusiastic about teaching and wanting his students to share in his love of mathematics. At the same time, he would not go easy on his students. He was not there to give anyone a free pass through his course, but he had the ability to take complex mathematical concepts and bring them down to a level where most everyone could understand what was being taught. I remember struggling with a part of this course that involved counting methods like combinations and permutations. It was my first time coming across this concept and for some reason I hit a bit of a metal block with some of the more complex problems. Thankfully, Dr. Dyer was able to sit down with me one-on-one and try every way possible to explain the problems until it finally clicked and I was able to not just answer the problem, but to fully understand the entire process behind the solution. The fact that he was willing to do this not just for one student, but for any student from any size class spoke volumes about his commitment to teaching.

I did not come across any other mathematics professors during my university career that have had such an impact on my learning experience and he has always been extremely supportive of his students long after they have left his classroom. To say he is deserving of this award is an understatement; no other professor that I have encountered could come close to matching the level of his teaching ability.

Sincerely, Angela Beck

Received from Angela Beck via email: angela.beck46@gmail.com Tue 18/04/2017 10:39 PM
April 12, 2017

Members of AAU Distinguished Teaching Award Committee:

The initiatives spearheaded by Dr. Dyer, his impact on his students and colleagues throughout the university, exemplify the proven excellence as a teacher and the requirement for pedagogical improvement by a winner of the AAU teaching award. Dr. Dyer is a born communicator and mathematical story-teller, not just an entertainer, but a thoughtful performer keenly interested in both the practice and administration of the teaching profession.

Others will detail the highlights from Dr. Dyer’s CV which are related to his teaching practice broadly defined, including: the President’s Award for Excellence in Teaching, and the Chair in Teaching and Learning (and associated activities). Instead, I will mention some observations by members of our department. Dr. Eduardo Martinez-Pedrosa indicates Dr. Dyer “has been a promoter of active learning and active engagement of the students in the classroom; in contrast to the traditional chalkboard lecture in mathematics” and he has received very positive feedback from his students by incorporating some of Dr. Dyer’s strategies. Mr. John Craighead, an instructor in our department indicates that Dr. Dyer “takes a very active interest in sharing with all colleagues”, “encourages, reassures and supports new faculty personally, professionally and politically”, and “after refining new teaching approaches like reverse classrooms and brief videos, Danny has shared these techniques with colleagues both informally and formally”. He also “includes new faculty in project and grant applications thereby exposing them to such opportunities and the broader academic community”.

Dr. Dyer is constantly evolving his own teaching style and course management. His willingness to responsibly experiment (switching to a flipped classroom style in his first semester Calculus class, enhancing the online content (including 400 short videos) for our distance first semester Calculus course, including small projects, and allowing students to revisit an exam after the initial evaluation, etc.) — inspires all of us to re-evaluate our approach and strive to do better.

Administratively, Dr. Dyer has played a pivotal role in MUN’s First Year Success Advisory Committee — identifying academically at risk first year students and providing additional resources to help overcome their shortcomings. Dr. Dyer and I share the same sentiment “We have a moral obligation to try to help those we accept into our programs graduate”. Growing up in small town Newfoundland, both Dr. Dyer and I benefitted greatly by the willingness of former faculty members to act as mentors for promising young mathematics students. Dr. Dyer has been tirelessly involved in many outreach activities to continue this tradition.

In summary, I believe that Dr. Dyer embodies both the spirit and the specific attributes required of a winner of the AAU distinguished teaching prize. Should you have additional questions please do not hesitate to contact me.

Sincerely,

[Signature]

Dr. Ronald D. Haynes, Professor
Department Mathematics & Statistics
12 April, 2017

Dear Members of the Selection Committee AAU Distinguished Teaching Award,

Danny is a larger than life character with a ‘geeky’ interest in modern technology, a wicked sense of humour and an infectious booming laugh. Combine this with his passion for mathematics and an insatiable desire to share his curiosity about the world, then you have the the essential heart and soul of an outstanding math teacher. His curiosity means that he is always open to innovation in his teaching which, together with his ability to inspire students, have been the hallmarks of his teaching career at Memorial University.

Danny has regularly asked to be part of the MATH 1000 (Calculus I) teaching team and over the last few years he has made it his mission to improve the way we teach and deliver this pivotal gateway course. As part of Project Engage at Memorial Danny has entirely redeveloped the way he delivers MATH 1000 using a heavily student centred approach with a large amount of class time spent doing mathematics as opposed to the more traditional lecture. Danny led a small team of instructors from three Memorial campuses (St John’s, Grenfell and the Marine Institute) to revamp the MATH 1000 distance section making a much more up-to-date use of technology and in particular developing a large bank of videos so that students can actually see math being done rather than struggling with a print explanation. The intention is that this video bank will become a resource for all instructors and students connected with MATH 1000. Over 1,400 students a year pass through MATH 1000 so this is a significant learning experience for a large number of Memorial students – the department is indeed lucky to have a number of very committed instructors involved with the course and we are particularly fortunate to have Dr. Danny Dyer among those instructors taking on a strong leadership role. Danny’s leadership role in teaching and learning now extends well beyond the departmental level to the wider university community.

Danny was the only member of the First Year Success Advisory Committee from the Faculty of Science, he lobbied to have Math included in the program and obtained funding for an additional Math Help Centre in the Tutorium (in Memorial’s QEI Library). In Fall 2015 Danny was appointed to the Chair in Teaching and Learning for the Faculty of Science which is a significant recognition of his teaching leadership role in the Faculty of Science.

More recently Danny and a Departmental colleague, jointly with CITL (Memorial’s Centre for Innovation in Teaching and Learning), obtained $15,000 from the Teaching and Learning Fund to develop a teaching/personal development skills program for graduate students in Mathematics and Statistics. The program began with marker and lab assistant training for graduate students during the Fall semester 2016. This will represent a significant ‘added value’ to our graduate degrees and enhance the quality and employability of our Masters and Ph.D. graduates.
In early 2016 Dr. Dyer, as the Teaching and Learning Chair, directed a very successful teaching and learning retreat for the Faculty of Science. More recently he successfully applied (with colleagues from DELTS) for funding from the Teaching and Learning Fund to introduce an ‘in-house’ online system for submission of assignments, to be used initially with MATH 1090 (Pre-Calculus).

Danny has also been a real force in the Department’s outreach activities with high school students: participating in activities around the Blundon Seminar, the annual retreat for high achievers in various high school math competitions; organising and running the Math Leagues, particularly the Junior Math League – the Math Leagues are team based high school math competitions usually held on weekends; and playing a major role in the SHAD Valley program – Danny and his wife basically give up their Summers to this program!

All of this speaks strongly to the leadership role which Danny has assumed in developing talent and, improving teaching and learning outcomes, in our Department, the Faculty of Science and the wider University community. Danny’s effectiveness as a classroom teacher is clearly evident in his CEQs (Course Experience Questionnaires), a summary of the ‘overall rating’ for Danny’s last five years of undergraduate teaching is presented in the table below.

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<th>Semester</th>
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*Courses: MATH 1000, Calculus I; MATH 2130, Technical Writing in Mathematics; MATH 3240, Applied Graph Theory; MATH 4340, Combinatorial Analysis.*

A measure of the Danny’s effectiveness as a mentor of undergraduate students is his outstanding record of supervising undergraduate student research. In just over ten years Danny has supervised seven Honours projects, six NSERC USRA summer research students, one SHAD Valley internship and six MUCEP (Memorial Undergraduate Career Experience Program) based projects. All of this speaks strongly to Danny’s effectiveness as a teacher/mentor and the leadership role which he has assumed in developing talent and, improving teaching and learning outcomes, in our Department, the Faculty of Science and the wider University community. However, for individual students it is Dr. Dyer the classroom instructor who makes a palpable difference in their lives – the larger than life Dr. Danny Dyer who takes a personal interest in their progress in courses and inspires them to undertake further study in mathematics. It is my pleasure to recommend Dr. Danny Dyer in the strongest possible terms!

Best Wishes,

Chris Radford,
Professor and Head.
Appendices

A. Student Ratings Questionnaires

B. Sets of Student Comments
   (Compiled by the Centre for Institutional Analysis and Planning)
   - Math 1000, Fall 2014
   - Math 2130, Winter 2013

C. Course Descriptions and Rationale for Inclusion
# Appendix A: Student Ratings Questionnaire

## Course Evaluation Questionnaire

**PART I: Instructions. Please Read.**

Select the numbered circle and/or type your response in the designated area corresponding to each statement.

### Part II - Course Delivery

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<td>Question 4: The instructor stimulated my interest in learning the subject matter of the course</td>
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<td>Question 5: Useful feedback was provided on my work</td>
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<td>Question 6: The instructor communicated course concepts effectively</td>
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<td>Question 7: Overall the quality of instruction was</td>
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### Part III - Course Components (answer as appropriate to this course)

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<th>Question</th>
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<td>Question 8: The texts helped me learn course content</td>
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<td>Question 9: The labs helped me learn course content</td>
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<td>Question 10: The assessments (tests, assignments, presentations) helped me learn course content</td>
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</table>
Question 11: The technology used (e.g., D2L, email, chalkboard, film) helped me learn course content

Question 12: The workload was appropriate to the course

Question 13: Overall the course was well organized

Part IV - Comments

Question 14: If you had to select the best aspects of this course, what would they be?

Question 15: What aspects of this course could be improved and how could they be improved?

Part V - Instructor Provided Questions (if applicable)

Question 16: Instructor requested feedback (if applicable)

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<th>Strongly Agree</th>
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Question 17:

Question 18:

Question 19:

Question 20:

Question 21:

Question 22:

Question 23:

Question 24:

Question 25:

Question 26:

Appendix B: Sets of Student Comments

1. Math 1000. Calculus I, Fall 2014

Q 14 = If you had to select the best aspects of this course, what would they be?
Q 15 = What aspects of this course could be improved and how could they be improved?

Q No Comments

14

Being able to resubmit a question after the tests and the hands on learning - we would work on problems together in class and Dr. Dyer would come around and help

14

Dr. Dyer was by far the best professor I've ever had. He was respectful and funny and genuinely cared that we understood what he was teaching. Also his teaching method was unique and totally successful in my opinion.

14

Dr. Dyer was very hands on with his students, giving us time to work on problems in class and being able to ask questions when we didn't understand something.

14

Great Teacher, kept you interested and very available and approachable

14

Great prof. Interactive method where he explains and then we tackle some problems right on the spot really helps solidify learning. First time around I took math 1000 it was just a prof talking for 50min and clearly it was easy to lose interest and leave not having learnt a thing.

14

I enjoyed how he let us work in groups, not to copy work, but to understand the material together and to help each other. I like how he gave us time in class to work on problems and ask questions rather than just lecturing all class. The videos he posted were also very helpful.

14

I like how the course was taught. We were given class time to work on questions and gain useful feedback

14

I liked how we could communicate with others about assignments. I also like when given questions to do, the answers were provided. I also liked how Dr. Dyer did examples then told the class to do the next one and the newfound go back and do the answer.

14

I liked the fact that Dr. Dyer organized the lectures in a way that was different than normal math lectures. He gave us time to work on questions on our own and a chance to ask questions if we didn't understand something. Because of this, I found that I learned and understood the material in class rather than writing down notes each class then going back and trying to figure it out when it was time for a test. I also found that the videos Dr. Dyer posted online were quite useful.

14

I really liked having time to work through questions in class and try to solve the problems myself instead of a regular lecture format. The Prof. was very knowledgeable and made the course work easy to understand.

14

New teaching format, pre-existant notes

14

Notes on D2L were well organized and that he posted both blank, and completed set of notes

14

Notes typed up to be filled in were very nice. - helped keep things organized

14

Professor Dyer's new approach in teaching helped considerably in learning the material. Allowing students to work on problems in class together with help from Dr. Dyer and a TA make the world of difference in learning the sometimes daunting amount of material. Having class notes available before class with room for workings is also helpful in class and also when studying. I suggest this be a new requirement for all Math 1000 Professors to provide. I have struggled with Math 1000 in the past but now feel confident I will pass the course with flying colours. Dr. Dyer really does care about his students doing well and goes above and beyond to do so. I also enjoyed his sarcastic humor and his seemingly never ending witty t-shirts.

14

Professor was able to explain concepts extremely well. Dr. Dyer was able
Q 14 = If you had to select the best aspects of this course, what would they be?
Q 15 = What aspects of this course could be improved and how could they be improved?

Q No Comments
---
to explain the reason for doing each step in problems, and why certain things could or could not be done.
14 The instructor's method of teaching was brilliant. Assignment provided covered the entire topic well and tests you level of understanding. The midterm exams provided were of standard quality because the question asked
14 The opportunity to complete an extra question after each midterm was a great learning experience and really helped improve my grades on both midterms. It should be an aspect of every math course!
14 The way Dr. Dyer taught, by having us print off notes and fill them out in class, really helped me to understand what we were doing and gave us time to practice things we didn't understand.
14 The way in which Dr. Dyer explain the class and the topics
14 The way the prof taught it. It was very very very helpful to have him go through the course with mainly examples, and then giving us time to work through them in class. I never want to learn math any other way, and it makes me sad that he isn't teaching 1001 next semester.
14 The web assigns, the opportunity to resubmit a question and the posting of old exams.
14 We had time to do questions in class and ask questions when we didn't understand it. As well Dr. Dyer was an amazing teacher and knew what he was doing and could teach us it without confusing us.
14 being able to re-submit a question after the midterms!!! interactive learning. Being able to work on examples during class time and working with people around you, as well as help from prof and ta during class work.
14 the way that the notes were done was awesome.
15 Found Special Projects to be extra work, but I'm sure are intriguing for those who continue on in the mathematics field.
15 Help centre actually needs to help students. All they do is tell you to "think" but the reason I'm there is because I've tried and I can't. Some students work better from reverse engineering a problem and the help centre needs to realize that.
15 I did not find the written assignments very useful. They were very stressful and confusing and for the most part weren't applicable to exam material. The short projects were outrageous except for the second one.
15 I didn't find the short projects to be helpful at all. They mainly confused me more, and didn't seem to have much to do with the course content.
15 I don't feel like there is anything that could be improved. The assignments were difficult but it was only to challenge us and make us work hard.
15 I found that the weekly assignments (not on webassign) were too difficult for the course. I put a lot of work into each assignment, including going to the math help centre or asking Dr. Dyer for help at least once each week, but I still did not receive the mark I thought I deserved on most assignments. I did not think it was fair that I received high A's on both of my midterms but received many B's and below on assignments. I think that students would still learn as much from slightly easier assignments. Even though each assignment was worth less than 1 percent of our final
Q 14 = If you had to select the best aspects of this course, what would they be?
Q 15 = What aspects of this course could be improved and how could they be improved?

Q_No Comments

15 I think the way the course was done was great
15 More weight on weekly assignments so I'll have more motivation to do them and do them well.
15 One thing that I think can be improved on is how much the shirt assignments are worth. I think that these assignments should be worth a lot more than just 1% of our mark due to all of the time and effort that is put into these projects
15 Put notes up sooner, many times it was just before class and many of us could not get the notes due to other classes or appointments.
15 Since the assignments are worth so little, it doesn't give much motivation to do them, so adjusting the grade would help. Also Dyer also skips some small details that may not be obvious to some students and sometimes it makes it hard to follow the examples he's doing on the overhead.
15 Some of the short projects were really challenging. I understand that they are meant to generate thought, but sometimes there was too much of a leap between what we had learnt and what was expected on the assignments.
15 The assignments were pretty tricky
15 The short projects take too much time.
15 The short projects that we were assigned I feel were a waste of time. They included higher order questions which was content we were not going to be tested on and simply took time away from the regular course material that we should be studying. The majority of students in this course will not be continuing with further math classes, therefore I felt the higher order questions like the projects were not needed in our class.
15 The text is expensive and not necessary unless you are planning on continuing with math studies and should be told so to students he first day of classes. Dr. Dyer always supplied adequate explanations in class notes and if something was unclear he was always available for help. Web assign is also expensive and just adds an extra layer of work to do which is hard when trying to complete work for four other courses. It also does nothing in helping learn the material. My suggestion would be to put the weight of the webassign marks on the assignments to help justify their difficulty and long time to complete.
15 When asking questions it can be intimidating.
15 having to spend over $100 on a text book I didn't have to open was kind of annoying
15 remove short projects and add the marks to assignments instead. We do so many assignments (along with webassign) and have them not not worth a lot of marks
15 the short projects seem to be way outside of the scope of this course and the "optional" revision of a question on an exam negatively affected my mark.
Nothing

The course was mostly independent work but help was always available. The help and feedback offered were both very useful. If any issues came up in the papers it was always possible to get pushed in the right direction again.

The last two labs were satisfying to complete, they were interesting.

There are many professors at this University who are very knowledgeable but they are not good teachers - they have a difficult time communicating their knowledge and getting students excited about the material. Dr. Dyer is one of the best teachers I've had at Memorial. At times it was uncomfortable coming to class knowing that I'd have to discuss my paper (because discussing ideas and answering questions on the spot is a weakness of mine), but over the course of the semester it became more comfortable and the benefits outweighed my nervousness. Instead of waiting around for students to ask questions, Dr. Dyer took an active approach - he wandered around the class asking each student about their paper. Even if the student didn't think they had any questions, lots of times very helpful information would come out of these discussions. I was thankful for this. I don't know if I would have survived the course without Dr. Dyer's instruction - so thank you Dr. Dyer if you are reading this!

Get a better teacher

The course work seemed to be a bit more difficult than other courses of the same level.

The first lab was pretty boring, really the second lab could have been the first, and that would have been more interesting, but still a gentle enough first assignment for the course.

The work I had to put into this course was far greater than any other course I've taken at the 2000 level. I found the other courses I took this semester suffered at the expense of this one. It consumed most of my time. I also found that the mathematical content of some of the projects required more knowledge than would be provided in Math 1000 and 1001.
Appendix C: Course Descriptions and Rationale for Inclusion

Math 1000. Calculus I. This is a first course in calculus, dealing with the topics of limits, continuity, and derivatives, and the applications of these topics. Typically, the students in this course are first-year students or second-year students who had entered the university the previous year taking a pre-calculus course.

The student comments from Math 1000 in the Fall 2014 semester were chosen for inclusion for several reasons:
- the course and my redesign of it are described in part four of this dossier;
- the course accounts for 50% of my teaching assignment in the past five years;
- it enrolls students from multiple disciplines and for most is a required course;
- it is a challenging course to teach and deals with content that many students struggle with;
- it is a large enrolment course for which almost 30% of students completed the online Course Evaluation Questionnaire; and
- the Fall 2014 semester was the first semester I taught the redesigned course using a flipped classroom approach.

Student comments indicate that the fill in the blank notes, the videos, and problem-solving in class contributed to their learning. They liked the opportunity to work with and learn from their peers and to redo a question from their midterms. They also appreciated my availability for individual help and commented that I could explain concepts in terms they could easily understand. Most of the negative comments relate to the assignments and projects. As Math courses typically have a written weekly assignment, it is also quite normal for students to complain about the length of assignments. And, because the assignments were difficult, students suggest that they be worth more towards their final grade. Many students found the short projects difficult and not relevant, particularly for those who will not go on to become math majors. As the projects were a new innovation, I took the criticism to heart. Rather than remove the projects, I decided to alter them somewhat to maintain their rigor while reducing the amount of time and work to complete them.

Math 2130. Technical Writing. Students in this class are normally pursuing a Math major, though some students take it as part of a Math minor. Typically, students are mid-degree, though some students leave it to their final year, as they are concerned about the workload.

The student comments from Math 2130 in the Winter 2013 semester were chosen for inclusion because, like Math 1000, this course and the effort I devote to it is described in part four of this dossier. Also, given the two-year/four semester period of the report on student ratings, other than the Fall 2013 offering of Math 1000, this is the only course in that period for which I received more than two responses to CEQ questions 14 and 15. Student comments that the workload is heavy are fair; it is heavy. Frequently, the workload is exacerbated by time management problems. This is primarily the reason for the introduction of graded milestones that I mention in my discussion of this course in part four. Younger students, particularly those used to starting assignments a day or two before the due date, are often buffeted by the depth and length of the projects, and sometimes take several weeks to understand the time commitment necessary. However, it remains a signature course for our degree program, and I am frequently asked by former students from this course to provide reference letters for their future endeavours.