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Research Papers in a Math Methods Course: A Window into the Life of Ramanujan

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An elementary mathematics methods course offers an opportunity to broaden the lens through which prospective teachers may view mathematics. Many students perceive mathematics to be clear and devoid of controversy. The answers are clearly right or wrong. It follows that those who do not enjoy mathematics may think of mathematics as a cold subject. The discipline to which they have been exposed is not the mathematical world in which stories, ideas, and developments have been acknowledged in an engaging and passionate sense. Ask these students to talk about mathematics, and one finds that they have mathematical interests of many sorts—disguised perhaps beneath the umbrellas of music, art, language, literature, science, and history. The mathematical world has become separated from the domains which people commonly identify as academic areas of interest or hobbies. Of course, there are those who like mathematics and may not appreciate the mathematical connections to the various other areas.

How can we effectively address such perceptions in a way that will enhance the mathematical appreciation of such students? Research papers¹ have been employed in my own teaching to address this concern. The selection of a topic for such a paper is a significant part of the experience. Some students are encouraged to pursue their interests in art, for example, to enter the realm of tessellations. Perhaps a project on Escher or some aspect of architecture will emerge. The predominance of female students in the programme raises an obvious topic: women in mathematics. Sto-

ries of Hypatia, Sonya Kovalevskaya, or Sophie Germain may become focal points of discussion. Mathematical concepts such as the introduction of zero, the consideration of Mayan arithmetic, various number systems, or algorithms for multiplication may become topics. Ideas such as Pascal's Triangle or the Fibonacci sequence may captivate students' interests. Others prefer to examine issues in mathematics education ranging from the use of calculators to gender equity or assessment practices. The fact that so many different topics are selected may be an awakening experience in itself. Writing a paper in a mathematics course represents a significant enough deviation from experience to justify some reconsideration of mathematics on the part of many students.

The remainder of this article is the work of Marlene Neff, a student in the elementary mathematics methods course (ED 3940) at Memorial University of Newfoundland during the winter of 1998. Marlene's paper focuses on the life of Ramanujan. It appears here in its entirety.

¹ Poster presentations have been used as alternatives/supplements to research papers in several semesters. The poster presentations tend to be more interdisciplinary in nature. Many students see them as more applied in that they may develop curriculum-based concepts that potentially connect areas of mathematics and science, for example. The poster presentations may also delve into mathematical history or other topics mentioned in the discussion of research papers.

"Anyone who has never made a mistake has never tried anything new."

--Albert Einstein
