Report on Sabbatical Activities

Jonathan K. Hodge, Ph.D.
Associate Professor of Mathematics

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During the 2008-2009 academic year, I was on a sabbatical leave, which was approved for work on the project entitled *The Integers and Beyond: Explorations in Abstract Algebra*.

As stated in my sabbatical proposal, the primary objective of my sabbatical project was to "compile, develop, and disseminate a collection of activities and materials suitable for use in Grand Valley's Math 310 (Modern Algebra) course." I am pleased to report that this objective was accomplished.

Throughout the year, I wrote and edited approximately 170 pages (11 chapters, or *investigations* as we called them) of an inquiry-based abstract algebra book. I met with my co-authors, Profs. Steve Schlicker and Ted Sundstrom, several times throughout the year, but the primary responsibility for drafting the text and making editorial changes rested with me.

During the summer of 2009, Profs. Schlicker and Sundstrom wrote an additional 130 pages (6 investigations), which I helped to edit. Prof. Sundstrom and I used the resulting 300 page text in both of our sections of Math 310 during the Fall 2009 semester. Prof. Schlicker plans to use the text in his section of Math 310 during the Winter 2010 semester.

My initial experiences using the text were very positive. I centered my class around reading assignments from the text, which students completed prior to each class. These reading assignments, however, entailed more than just reading. In the spirit of inquiry-based learning, the text is punctuated with activities that help students discover for themselves the main ideas of the course. These activities play an integral role in students' learning, and they formed the basis of our in-class discussions.

Although I have not yet received my student evaluations from Fall 2009, informal feedback from throughout the semester suggests that the text is readable, conducive to deep learning of course material, and a good resource for out-of-class work. The latter is particularly significant, as I (and several other professors) had been teaching Math 310 without a text for several years. Students had expressed a desire for more resources to use outside of class, but I found traditional textbooks to be unsuitable for this purpose, primarily because of their incompatibility with my inquiry-based approach to the course. It seems, at least initially, that the text that resulted from my sabbatical project has addressed this concern. I am also quite pleased that I was able to cover more material in my Fall 2009 section of Math 310 than in any of the other seven semesters in which I have taught the course.

The next step for this project is to revise the 300 pages currently completed based on classroom experiences throughout the 2009-2010 academic year. These revisions will take place during the summer of 2010, at which point we will also write an additional 200 to 300 pages of investigations suitable for use in Math 410, which is the sequel to Math 310. The resulting text will be quite comprehensive and suitable for use in a two-semester abstract algebra sequence at a variety of schools. Within the next year, we plan to contact publishers, with the hope that the finished book will be published sometime in late 2011 or early 2012.

For reference purposes, I have attached to this report the table of contents and the first two investigations from the text. I will also report at this time financial remuneration in the amount of $28,750 from Hope College, where I taught half-time (12 credits total) during my leave.