From the Classroom to Ampère's Law

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My collaboration with Professor Dulčić began in teaching, during the semester in which I was his assistant during the General Physics course. After that, I took over his lectures, continuing a teaching approach that emphasizes simplicity and clarity of physical models, as well as mathematical precision.

This teaching collaboration gradually developed into joint work on university textbooks. After publishing University textbooks Mechanics [1] and Electromagnetism [2], we are currently continuing work on a third book, with the plan to completing the cycle with a fourth. During the writing of the textbooks, certain problems and ways of presenting them outgrew the initial didactic framework and became topics for separate educational articles.

Here, I present several examples of the development of such ideas, with special emphasis on the work in which Ampère's law is derived from the Biot–Savart law for arbitrary geometry as schematically shown in Fig. 1. The basic idea was found by Professor Dulčić, after which we developed it together - first for presentation in the textbook, and then for an educational-scientific article [3]. This example shows how a question that arose when writing a teaching text can lead to a new transparent result and how teaching cooperation with prof. Dučić naturally developed into a joint author's work.

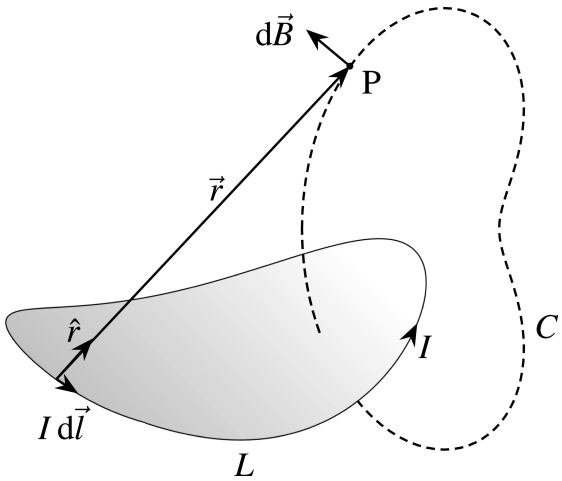

***Figure**: A schematic view of the derivation of Ampère's law from the Biot–Savart law for arbitrary geometry [3].*

References:
[1] https://www.croris.hr/crosbi/publikacija/knjiga/942779
[2] https://www.croris.hr/crosbi/publikacija/knjiga/942788
[3] https://iopscience.iop.org/article/10.1088/1361-6404/ae5af8