Review of: "Essential Calculus, a Revolutionary Approach to Teaching Calculus"

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In this review, I will try to focus on elements that have not been addressed by colleagues who submitted their reviews before.

1. The title. “Essential Calculus” sounds interesting and ambitious, while the rest of the title sounds a bit cocky. My colleagues from Mathematics Education domain usually object when they see words like “new” or “revolutionary”. I suggest choosing something more modest, like “an Alternative Approach …”. Taking into account preceding reviews, it might be better to avoid “Essential Calculus” too, because some important part of calculus are indeed omitted in this article. What colleagues often mention and the author confirms is that the article is primarily related to teaching physics students. This might be reflected in the title already. My suggestion is to try something like “An Alternative Approach to Teaching Calculus to Undergraduate Physics Students”.
2. The abstract. It is quite short, but not very informative. The information contained is rather general and may be understood differently by people from different parts of the world. I suggest to focus on the facts. Like “The article is about an alternative approach to teaching calculus to undergraduate physics students at (high rank uniiversities, technical colleges, …) in (the US, Europe, Africa, …) with the goal of covering differential equations in Week 10.” Then explain briefly why did you choose this goal, and what approach you use in the article to achieve the goal.
3. The introduction. The Introduction should be setting the background. I mean, to say something about the field (teaching calculus). Mention some purposes and approaches that one can meet at universities and colleges all over the world. Give facts and references to help the reader to get a broader context. Further, the Introduction should also contain an overview of what you plan to do in what section (describe briefly organisation of the article). I believe that the calculations included in Section 1 can be safely moved to a new section, or partially merged with Section 2 and partially omitted at all, since their only purpose is to show that some simple problems are difficult to solve. I suggest to give a reference to those calculations. Remark: I am not an expert in history of mathematics. I just am not sure whether calculus was developed by Newton only. Might be true about modern physics, but I heard something about Leibniz related to calculus too.
4. Course outline. The suggested program of the course that takes place in the end of the article should come much sooner. Perhaps in the Section 1.
5. The terminology. For nonnative English speakers, it would be an advantage to read full terms, not just abbreviations. I mean shortcuts like “trig functions”, “exponentials”, “logs” and so on. Try to think about readers' convenience and give full names at least once whenever possible.

6. Section 3. It is quite outstanding from the rest of the article. There are two subsections. I suggest to split the section into two sections if possible, so that the structure looks more consistent. Alternatively, the two subsections can be merged with no subsections, just headings. Further, the text “2.3 Quotient rule and rational functions, i.e ratios of polynomials” looks strange, being in Section 3. I suggest to think about “Quotient rule and rational functions, i.e ratios of polynomials” only, and do something similar with “Diferentiation” and “Product and chain rules”. Then no subsetions are needed.
7. Figures. It is a good practice to include captions, and preferably descriptions to figures. Also think about coherence, it is evident that different figures come from different sources. Could they be done in a more coherent way so that they look more similar? Also think about accessibility, vector graphics can be scaled while pixel-based graphics cannot.
8. Mathematics typesetting. It seems that some of the mathematics is typeset in LaTeX, and some not. Try to be more consistent in the typesetting. I guess that overall use of LaTeX is preferred.
9. Conclusion/summary. It is a good practice to write a Conclusion where the author summarises achieved results, evaluates achievements and outlines further steps. If it is not possible or does not make sense, at least a summary would be nice.
10. Methodology. Somewhere (Introduction, Conclusion) you should introduce your approach (intuitive, avoiding higher mathematics) and discuss why you believe that it is the right approach for your target group. It is important to do it because for other target groups, the approach suggested by you might not be convenient. I would be cautious especially about the sentence “While the many equations in the paper are intimidating at first glance, there is nothing complex or ‘advanced’ about the derivations, they represent simple algebraic reasoning.” Based on my personal experience with (electrical and ICT engineering) students, “algebraic reasoning” as well as other similar high school topics are the most challenging parts of any calculations and derivations in undergraduate mathematics courses.