

***Interactive comment on* “Transforming school students’ aspirations into destinations through extended interaction with cutting-edge research: “Physics Research in School Environments”” by Martin O. Archer et al.**

Anonymous Referee #4

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Thank you to the authors for working to summarize their program and research as part of the PRiSE program. It is clear that this group has taken the task of creating and evaluating their educational program seriously and I commend them on identifying many different facets of the program to document and share with the broader community. The paper is generally well presented but as a reader first learning about this program I have some major revisions to suggest.

Major Considerations for Revision: While I see the clear value and need to share this work with the broader community, especially given the authors’ goal to “introduce a

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scalable framework for protracted research-based engagement with schools”, I have some questions about how this and the other papers submitted simultaneously in review in Geoscience Communication about the same program differ from one another and how they each meet the journal requirement of making “a substantial contribution to scientific progress within the scope of Geoscience Communication (substantial new concepts, ideas, methods, or data)”.

Further, based on the references cited in this manuscript, the lead author also has another paper in review at another journal that seems to align with a similar premise being presented here. As a reader (who hasn’t read all of these manuscripts to know exactly how they differ), I’m left wondering why someone would need to read four papers about a program to understand the structure and impact. While I fully appreciate the appropriateness of evaluating and interpreting results from a program like this in multiple ways, the current structure of the arguments suggests that they might be able to present their work in one well-structured and concise paper (or two) that really uses the data to substantiate the claims being made and demonstrates how they are meeting their Theory of Change which states: “The intended impact of PRiSE is to contribute towards the increased uptake and diversity of physics at higher education.”

As a reader new to the program, and taking the abstract at face value, I found myself asking fundamental questions about the structure, resources, personnel and design of the program. This is touched on in brief in various parts of the paper but some challenges about the program structure are mentioned starting in line 500 that seem to warrant further comment, especially in the context of thinking about scalability of this program. Other details like the core resources or research that undergird the program are mentioned in the latter part of the paper and seem a bit out of place. Perhaps some of the text could be instead captured in visuals or a diagram? Overall, while the Theory of Change and surrounding literature review are helpful for framing the need and context of the PRiSE program, the body of the text and data presented don’t seem to directly align with or support the premise of the paper as articulated in the abstract

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and conclusions.

To concretely illustrate this, in the abstract the authors state “This illustrates that the model appears to provide highly positive experiences that are otherwise not accessible to schools and that the extraordinary level of support offered is deemed necessary with all elements appearing equally important. Researchers and public engagement professionals seem receptive to the PRiSE framework of schools engagement and it has started to spread to other institutions.” While the authors present some data to demonstrate their programmatic success, for their most critical claims, they point the reader to a different paper (as above) and don’t really touch on the focal point of their theory of change. Further, they mention on several occasions in the paper the “extraordinary level of support” needed and offered through this program by the researchers but do not elaborate on how this might be a barrier to the scalability of their program. It would be helpful to the readers if the authors were more explicit about how much time is required from researchers to support this type of programming, how researchers are recruited and rewarded/acknowledged for their participation and how the program itself is funded or supported, especially in light of the acknowledged barriers to sustaining engagement by researchers. These types of structural and programmatic details are key to seeing how the program supports their ToC and offers valuable insights for those seeking to recreate this type of ‘research in schools’ program.

Building on the other reviewer’s comments, I think there is ample opportunity to streamline the text, and clarify the presentation to only those details most salient to communicating to the reader the design and implementation elements of the program, while being much more explicit about how the data they have collected demonstrate if/how (or not) the program ‘meets’ their Theory of Change. This is essential to demonstrate a) how the program is scalable and b) the documented value and impact and therefore, why it is a model that should be scaled to other schools/locations/programs. I would encourage the authors to significantly revise this manuscript and to think about how to present the details about how the program works and the data they have that indicates

that the program is successful (and why) together in one paper.

Based on the review criteria, this article falls short in demonstrating (in relation to the other papers submitted for review at the same time) how each makes a unique and substantial contribution that warrants publication, and as currently written, this paper does not really provide sufficient evidence to support the interpretations and conclusions. I have no doubt that through some more careful writing, streamlining of the text and analysis of the data alongside the programmatic structure, that readers would see the substantial contribution being made through this program and its structure and the value it offers as a model that could be replicated elsewhere.

While there is work to do, I really do commend the authors on their thoughtful approach, clear investment in data collection and analysis, and for developing and iterating on a program that seeks to make a novel contribution for bringing research to schools. They certainly have invested an enormous amount of time and dedication to the PRiSE program and I really hope to see this work shared with the science communication and education communities.

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