

## EDITORIAL

## Science Teacher Action Research in the Time of the COVID-19 Pandemic

Allan Feldman 

University of South Florida, USA

[afeldman@usf.edu](mailto:afeldman@usf.edu)

In this editorial I tell the story of science teacher action research in response to the COVID-19 pandemic. In it I try to do two things. The first is to show how science teacher expertise can grow and be shared within an online community of practice (COP), and then distributed to a wider audience of science teachers. The second is to make problematic how we define action research and my role in facilitating the COP.

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This editorial is a product of the COVID-19 pandemic. Schools in Florida have been closed since early March and instruction has moved to being online. This is likely the case for most readers of this editorial as we try to reduce the spread of the COVID-19 pandemic. For those of us who work in science education, we've seen the rapid, emergency roll-out of virtual technologies that promised to make it so that teachers could continue to teach and pupils continue to learn. However, I have heard from personal communications with teachers and through the media that it has been extremely challenging for science teachers to provide their pupils with the reform-based experiences that are endorsed by state (Florida Department of Education, 2010), national (NGSS Lead States, 2013), and international (Hazelkorn, 2015) frameworks and standards. As a result, I decided to invite local high school (secondary) science teachers to participate in what I called the COVID-19 Community of Practice (COP). Ten teachers agreed to participate and I was able to secure funds to provide each with a small stipend. The nine women and one man represent all school science subjects, and teach a wide range of pupils in nine different schools.

We've been able to meet six times via Zoom for the teachers to share their expertise with one another and to produce some type of resource that could help other science teachers in their online teaching. In the first four meetings the teachers talked about the different types of apps and platforms that they used to interact with their pupils. These included Nearpod, PhET, Gizmos, Padlet, HyperDocs, STEMscopes, and EdPuzzle, as well as their classroom management system, Edsby (you can do an Internet search on their names to learn more about

them). As each told about their use of the app, the others asked questions about its operation and how they were used by the teacher telling the story. At the end of each meeting, all the teachers described what they would try out in the following week. This sharing and questioning of stories, and the trying out of ideas, are two parts of what I have described as enhanced normal practice (ENP) (for more information about ENP see Feldman, 1996; Feldman, Altrichter, Posch, & Somekh, 2018). The third part of ENP is to engage in what most people think of as action research, with one or more cycles of action based on the collection and analysis of data. There is a possibility that the COVID-19 COP teachers will continue to collaborate in the group and decide to delve more deeply into their online teaching of science using these methods. At this time they are in the process of putting together materials that describe each of the platforms, how they are used in general, and providing examples from their practice of how they can engage pupils. The materials will be available to other teachers on a website.

As one might expect, the conversations in the meetings went beyond the task at hand to include the teachers' concerns about the eLearning environment, and how it affected their interactions and relationships with their current pupils. They also talked about the obstacles they may encounter in the next academic year if the schools don't reopen for face-to-face teaching. They emphasized the importance of the relationships they develop with individual pupils, and are concerned this would not happen in the virtual context with pupils whom they have not met or interacted with before.

It has been very exciting for me to be engaged with them as they worked together on the grassroots level to respond to the problems they have faced due to the pandemic. To me this demonstrates once again what Rufous Jones said about how "quiet processes and small circles [are where] vital and transforming events take place" (Religious Society of Friends, 2013, ch. 24.56). However, was it action research? I'm willing to say it was, because it sort of agrees with the definition that I use for action research. It is based on Stenhouse's definition of action research as systematic, critical inquiry made public (Stenhouse, 1975, 1981, 1983). To it I've added

Action research happens when people are involved in researching their own practice in order to improve it and to come to a better understanding of their practice situations. It is action because they act within the systems that they are trying to improve and understand. (Feldman, 2007, p. 242)

Although I can't go into all the details here for why I say this because of space limitations, I am confident that what the science teachers did in the six meetings, and in their teaching between the meetings, was done according to a plan, they looked critically at their practice situations, and they are in the process of making their work public. They also took actions. The teachers made changes in their practice based on what they learned from one another in the Zoom conversations, both to improve their practice and to better understand their educational

situations. This agrees with most of what is in Stenhouse's and my definitions. So yes, let's call it action research.

In an editorial that I wrote for another journal (Feldman, 2020), I argued that when academics like me write about practitioners engaged in action research, as in this editorial, we ought to also engage in action research on our practice, what Elliott referred to as second order action research (Elliott, 1988). Before reporting on my reflections on my role, I want to point out that the COVID-19 COP was never a research project for me. From the start I said so to the teachers. While I would love to say the project was totally altruistic for me, I did feel like this was an opportunity to show that I was using my new position as an associate director of a center to help teachers as they rapidly shifted to eLearning. It also has served as a pilot for another project that will do outsider research on teachers engaged in participatory research.

As I reflect on my role as facilitator of the COVID-19 COP, I find myself reminded of the tensions that arise when an outsider with his own agenda tries to work collaboratively and democratically with practitioners who have their own agendas. One tension arose from my hope that we would focus primarily on figuring out ways to make the online teaching and learning more inquiry oriented, hands-on, and would engage pupils in argumentation. Instead, the immediacies of finding ways to connect meaningfully with pupils through the various apps and platforms became the focus for the teachers. A second tension is one that I've been familiar with for many years. I had told the teachers that what I hoped for as a product (after I accepted their focus for the COP) was a set of materials that could be used by other teachers that included descriptions of the apps and examples of how they used them in their teaching. The resulting tension was multifaceted. There was the tension with myself trying to be open about the format of the product while having an image of what I wanted it to look like. The tension that the teachers felt was somewhat in response to this. They found themselves trying to figure out what my vision was even as I was telling them that their reports on the app they chose could have whatever format they wanted. Basically what this tension was all about was trust – I didn't completely trust the teachers to produce something that I would see as "good enough", and they didn't trust me saying that they had a strong voice in what the product would look like.

The issue of trust is something that I have been wrestling with for many years. It shows up in the action research literature in which conclusions are drawn about how important trust is for the cohesiveness of an action research group, and about the relationship between an outside facilitator and a group of practitioners. We also know that it takes time to develop, and that it comes about when people are open and honest with one another. There is also some evidence that it is easier to engender when we meet face-to-face. Our new pandemic world has made that nearly impossible, and so those of us who facilitate collaborative action research groups find ourselves in the same situation as the teachers, needing to develop meaningful relationships with others in a virtual environmental.

I end this editorial by noting that while much has been written about the importance of trust, what trust is, is left mostly unexamined in the action research literature. I hope to someday have something useful to say about the nature of trust in action research, and if so, you may find it in an issue of Action Research and Innovation in Science Education. Until then, as with many other things, we know it when we see it and feel it, even if we don't know what it is.

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### References

- Elliott, J. (1988). Educational research and outsider-insider relations. *International journal of qualitative studies in education*, 1(2), 155-166.
- Feldman, A. (1996). Enhancing the practice of physics teachers: Mechanisms for the generation and sharing of knowledge and understanding in collaborative action research. *Journal of research in science teaching*, 33(5), 513-540.
- Feldman, A. (2007). Teachers, responsibility and action research. *Educational action research*, 15(2), 239-252.
- Feldman, A. (2020). Insiders and Outsiders—The Place of Second-Order Action Research in Educational Action Research. *Educational action research*, 28(1), 1.
- Feldman, A., Altrichter, H., Posch, P., & Somekh, B. (2018). *Teachers investigate their work: An introduction to action research across the professions* (3rd ed.). New York: Routledge.
- Florida Department of Education. (2010). Next Generation Sunshine State Standards. Retrieved from <http://www.floridastandards.org/>
- Hazelkorn, E. (2015). *Science education for responsible citizenship: report to the European Commission of the Expert Group on Science Education*: Publications Office of the European Union.
- NGSS Lead States. (2013). *Next Generation Science Standards: For States, by States*. Washington, DC: The National Academies Press.
- Religious Society of Friends. (2013). *The book of Christian discipline of the Yearly Meeting of the Religious Society of Friends (Quakers) in Britain* (5th ed.). Retrieved from <https://qfp.quaker.org.uk/>
- Stenhouse, L. (1975). *An introduction to curriculum research and development*. London: Heinemann.
- Stenhouse, L. (1981). What Counts as Research? *British journal of educational studies*, 29(2), 103-114.
- Stenhouse, L. (1983). *Authority, Education and Emancipation*: Heinemann Books.

