



EGUsphere, referee comment RC2
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Comment on egusphere-2022-16

Julie Jebsen (Referee)

Referee comment on "Building confidence in STEM students through breaking (unseen) barriers" by Philip J. Heron and Jamie A. Williams, EGU sphere,
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This sounds like a great program, and I hope it was well received. There are many strengths, and although I have recommended major revisions, these are due to the lack of data to support conclusions and recommendations. I wish the rating options included "missing" as well as "poor", because poor is too harsh and does not convey this point. Please do not be discouraged by the comments. The aim behind this project is excellent. Mostly, I'm looking for a stronger theoretical framework and understand more information about the design, data, and results.

In the rationale, "confidence" is discussed, but this term is vague and more commonly used in everyday English than educational research. It is up to you how you want to frame this, but I recommend using "self-efficacy" and social cognitive learning theory as a theoretical framework, as I believe this supports the underlying values of the rationale and what I can see from the design. Similarly, rather than "fit", you will find more literature on "sense of belonging".

There is good consideration of many of the contextual barriers to education in the prison system and what information is presented about the methodology, but this also needs to factor in the massive problem of illiteracy and lack of educational qualifications, especially among young and first offenders. This could explain partly why some of the participants opted out of the assessments.

It is a great thing to consider how all learners can have their voices heard, and this is very important in EDI, but we need more information on how you operationalise and collect data for this. How did you know *all* of the learners had their voices heard? Is simply speaking out, regardless of content, enough?

Designing taught sessions and assessments to follow open ended questions rather than

dipstick questions to check if the learners have the correct knowledge is a great idea! This would reinforce the self-efficacy/social cognitive learning theory, should you choose to use this as a theoretical framework.

Lastly and most importantly, we need more information about the data. Without more details of who the learners were, how they experienced and perceived the programme, especially in regards to learning transfer, it is difficult to judge this manuscript. Without this, the framework of barriers listed as bullet points are more useful as a guide for future research than recommendations for practice. This is especially important given the title and emphases of the intervention on thinking critically and using empirical evidence to support conclusions.