Author’s response to reviews

Title: Five years' experience of an annual course on implementation science: an evaluation among course participants

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Author’s response to reviews:

Authors’ responses to the reviewers’ comments

We have now considered the reviewers’ comments and revised the manuscript accordingly. Below you find a detailed response to each comment with, if applicable, page number in the revised manuscript. Changes in the revised manuscript appear in red lettering.

Reviewer #1: This is an interesting article in an area where there is not much literature. The evaluation has limitations yet is helpful in providing additional data on training approaches and effectiveness. I have several comments and suggestions.

Many thanks for the positive words. We are grateful for the effort gone into commenting and making suggestions, which we believe will improve the paper.

1. The PBL part of their course is perhaps the most innovative aspect. I would like to see more details on this approach, perhaps with a more detailed PBL example so others might replicate this method.

As stated in the manuscript PBL “informed” the development of the curriculum, but it was not a “fully-fledged” PBL course (of which we have many at Linköping University). We described in what ways PBL is applied in the course. However, we find it quite difficult to provide more details about this.

Thank you for reminding us of the article by Chambers et al. We have read it and it is now cited in the Background section, p 3.

3. This previous study also evaluated a university course, so it would be useful to cite and discuss it: Norton WE. Advancing the science and practice of dissemination and implementation in health: a novel course for public health students and academic researchers. Public Health Rep. Nov-Dec 2014;129(6):536-542

Thanks for the suggestion. We have also added a reference to the article by Norton et al. (p 4)

4. Your introduction could more fully note that while there are numerous training programs, most are 3-5 day, short courses (TIDIRH, IRI) that cannot fully use the methods as in depth as those used in the current course.

This fact is now elaborated on in the Background section, p 4.

5. It would be helpful to see a little more content of the course. For example, more details on the lectures could be shown in Box 1. Would the authors make the lecture slides available to readers interested in modeling the current approach?

We would prefer not to provide more details about the course content or make the lecture slides available to all readers. However, anyone who is interested to know more about the course is more than welcome to contact the corresponding author!

6. Would you make the survey tools available as online additional files?

Yes! The survey tools have been added as additional files.

7. In Table 3, are any subgroup analyses possible (e.g., by sex, age, any other relevant characteristics of the students) that show different effects in different groups of students?
Unfortunately, data on age or gender are not available. The decision not to ask for age or gender was based on the low number of participants, which would make it easy to identify individuals if personal data were included. This is now mentioned in the Limitations section, p 16.

8. It is worth noting in the limitations section that you don't have longer-term indicators of academic (pubs, grants) or practice (new intervention approaches).

Agreed. This is now included in the Limitations section, p 16.

9. Did the course set out a specific set of competencies, for example see: Padek M, et al. Developing educational competencies for dissemination and implementation research training programs: an exploratory analysis using card sorts. Implement Sci. 2015;10:114. If not, this is a limitation.

We agree that this is a limitation. However, since the long-term evaluation was not planned from the beginning, this information was not obtained. This is now mentioned in the Limitations section, p 16.

10. Page 10: The section on Behaviour seems a little mismatched. The metrics used do not seem like behaviour change metrics (e.g., improved understanding). These seem more like knowledge metrics. A behaviour metric would be specific pre to post changes in how work is done, practices implemented, publications are written. It does not seem the design is strong enough to do justice to behaviour-related outcomes.

Our intention was to capture outcomes that could be attributed to the course content. As most of the participants were PhD students, writing of publications for example is expected.

We do, however, agree with the referee and we did struggle a bit when applying the Kirkpatrick framework. It would have been a strength if the questionnaire had included more specific questions on behavior, like the ones mentioned by the reviewer.

Reviewer #2:

This paper describes an evaluation of an implementation science course in Sweden.

There is justification for undertaking this study. Greater understanding the structure, processes and outcomes of implementation science training is needed. Gaining greater understanding of student experiences and how their feedback is used to develop educational materials and delivery
methods is an interesting area of research. The author's use of the Kirkpatrick model as a framework for this evaluation is useful.

However, there are some issues with the manuscript that would benefit from further consideration. Overall, the paper could be improved by adherence to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement: guidelines for reporting observational studies. This study uses cross-sectional methods, including an electronic (web-based?) survey and greater attention to methodological description and details are needed.

1. Title and Abstract-

The title could better reflect the paper (please refer to STROBE statement). This is an evaluation of an implementation science course. The title refers to an "annual doctoral-level course". Please review this phrase. Does this mean people undertaking a doctoral degree? From the results, not all people participating in the course were doctoral students?

Excellent points! The title has been changed and now reads: “Five years’ experience of an annual course on implementation science: an evaluation among course participants”. We have tried to adhere to the STROBE guidelines throughout the manuscript.

Including the country where this research was conducted would be useful in this abstract/title. Currently, only the name of the University is reported.

Agreed! We have added in the Abstract that Linköping University is situated in Sweden.

The authors described that two surveys were conducted. However, I'm unsure that "survey 1" should be described in this way. It may be more accurate to describe in the methods that course evaluation forms were distributed at the end of each course?

Good point. We have changed the term from “survey” to “data collection”, and now explain that the first data collection consisted of course evaluation forms.

Response rates should be included in the abstract.

Response rates have now been added in the abstract.

More detail on the number of items and how the "surveys" were developed should be included in the abstract.

Agreed, but the abstract allows for a limited number of words. However, the number of items has now been added. We would prefer not to describe how the questionnaires were developed in the
abstract (there is simply not enough “space”), but the questionnaire development has been expanded upon in the Methods section, Data collection, p 9.

2. Introduction-

The authors give examples of a number of universities delivering courses in Implementation Science. A broader and more global perspective on courses for e.g. including examples of course delivered in the southern hemisphere would potentially have greater appeal to a global readership. Similarly, the role of the WHO in implementation science education and other training providers would be a useful addition in this section.

We are aware of the WHO initiatives and the Implementation Research Platform. However, we wanted to give only a few examples. We did add studies suggested by the other reviewers, but prefer to keep this part as short as possible, but did provide a reference to WHO, p 3.

Please give a sense of the population size served by the county council.

This has been added to Background, p 3.

The introduction should include greater justification for why the Kirkpatrick model, versus other frameworks, was selected for use in this evaluation.

The Kirkpatrick framework is widely used and one of the researchers behind the study has found it highly useful in a previous study (Lindhe Söderlund L, Madson M, Rubak S, Nilsen P (2010): A systematic review of motivational interviewing training for general health care practitioners. Patient Education Counseling, Vol. 89 (1): 16-26). A justification based on this experience and a reference to the paper has been added, p 5.

3. Methods

The authors describe a "longitudinal" evaluation of participants. However, from the methods it seems that survey 2 is a cross-sectional survey of all previous students? Please ensure an accurate description of the methods with appropriate justification. If this study was a pre-planned longitudinal study designed to follow the progress of students over time, then this should be stated more clearly.

We agree that the term longitudinal is inappropriate for this study. This has been changed in the manuscript.

Greater description of the questionnaires is needed (for example, How they were developed? Who was involved? How many items were included? Did they change over time or was the same
questionnaire used for each student cohort?). Including the evaluation form as an appendix would be useful.

Agreed. The development of the questionnaires is now better described in the manuscript, p9. Further, the two questionnaires are added as additional files.

The pedagogical method of Problem-based learning is described (please reference this method). Also, consistent terminology throughout the paper would be useful as later in the paper "active" learning is described with less description.

We have added a new reference to Problem Based Learning, and also added some more information about the concept of “active learning”, p 6.

Please describe the total hours of teaching on the course, the number of teachers, and their expertise/seniority. Please give a sense of the expected amount of self-directed study included in the course (in hours is possible).

We have added the information requested, p 8.

Please give greater description of changes in the course content between cohorts and greater description of the "web-based course" in the spring. Is this the same course and is this also conducted annually or is this a different course and different cohort? How did the evaluation differ between these educational methods?

More information about the changes has been provided, p 7. We have also added information about the web-based course, p 7. This was (as stated in the manuscript) only given once, with a low number of participants, and no subgroup analysis is possible based on the low number.

Course credits are described in the methods. Is this a national system of credit points or a European/International standard that will have meaning for the article readers? Please consider removing this detail if it is only related to university credit points in Sweden.

Credits are based on the European Credit Transfer and Accumulation System (ECTS), which is now stated in the manuscript, p 8.

The authors describe that the course changed over time on page 6. Line 36 in the methods with "focusing more on implementation of evidence-based practices in health care settings". Was anything removed from this course? Please describe more detail about these changes, as this will influence the results of the evaluation.

Please see response above.

Data collection- Were questionnaires distributed face-to-face or electronically at the final seminar? How were they returned? Who distributed them (someone independent from the teaching faculty?)
Questionnaires were distributed face-to-face at the final seminar and they were answered and returned anonymously. This information has now been added in the manuscript. (p 8)

When first describing the Likert scale it would be worthwhile using more detailed descriptions e.g. 5-point Likert scale.

Agreed and this has now been added, p 8.

Pilot testing of the survey- How many former doctoral students were involved? E.g. n=? Pilot testing with students that were not on the course is a study limitation and should be stated as such. What changes were made following pilot testing?

The reason to ask students who did not participate in the course to pilot-test the questionnaire was that the total cohort was already small, and we did not want to lose responders due to taking part in the pilot-testing. Only minor changes were made, such as wording, clarification and sequence of response alternatives. We have already stated in the manuscript that minor changes were made, and we would prefer not to add more details. The number of students in the pilot testing is provided at p 9, and in Limitations, p 16, we discuss why these were not selected from the participants.

Was this a web-based survey? Was commercial software used? Please provide further details.

Further details have been provided, p 9.

Data analysis

Please describe data handling methods including software programmes. How was missing data handled for all items and in all parts of the study?

Data handling methods (pen and paper/ SPSS ) are now described, p 9-10. As all data are presented descriptively the reader is able to see where data are missing.

Please describe the analysis methods of the qualitative content analysis. How many people were involved in this analysis and how was data handled?

This is now more thoroughly described in the manuscript, p10.

4. Results

Did students not completing/ passing the course participate in this evaluation? If not, why not? This should be stated as a limitation if they were not included.
Our decision was based upon that only students who completed the course have enough experience to give their opinion. All the students who completed the course also passed the examination (initial or re-examination). The word “passed” has now been deleted to show that all students completing the course were included. We understand that if there had been students who took part in the course but did not pass the exam, those might have had differing experiences. However, this was not the case with any of the students.

Please explain the term current work in "healthcare development"? Is this international healthcare development?

It is quite common in Swedish health care that nurses or allied health professionals with a PhD degree work with health care development at a local level. We have tried to make this clear in the manuscript. Health care development work includes, for example, work with various quality improvement projects and guideline implementation. Please see information added at p 10.

Why were categories on the 5-point Likert scale assigned numbers 1-5 and means calculated? Please reconsider these methods for this categorical (ordinal level) data.

For data collection one, with a small number of responders from each year, this was considered the most practical way of handling the data. We are aware of the methodological weakness with transforming ordinal data into numbers. However, by being transparent with how this was done, we hope the reader can judge the trustworthiness of the data.

The results section repeats information in Tables 3.

Yes, some lines are highlighting the most important information from table 3. In our opinion this is relevant, but if the reviewer insists we are willing to delete this information.

Tables

Table 2- "Accepted" - Do you mean "Number of students participating in programme"?

Please consider renaming "survey 1" as per comments above.

We have deleted the information about how many students that were accepted to each course as it may be confusing. Instead, we only describe the number of students completing the course. Survey 1 has been renamed and is now called “Data collection 1”.
Table 3- Please change Table layout to a more usual presentation style for survey data e.g. put response categories of 5 point Likert scale on the left-hand side column of the Table and only present figures in body of Table rather than figures and text.

Table 3 has been revised according to the reviewer’s suggestions.

5. Discussion/Conclusion

The Discussion overstates the findings at times. For e.g. the "undeniably favourable results". Please remove the term undeniably. One explanation for these "favourable results" may be related to the methods used in this evaluation? This needs greater consideration, as does the influence of how data was collected at the end of each course, and the potential influence of bias in survey response due to items, questionnaire layout, distribution methods etc.

We have now applied a more humble attitude in our discussion, reflecting on the methodological weaknesses. Please see changes in the Limitations section, p 15-16.

Page 13 of the discussion line 5 and the paragraph commencing "the course is aimed at achieving active learning..." and the following paragraph on describing the course repeats previous information in the methods. The third paragraph related to PBL should be placed in the earlier part of the paper related to this topic.

We have adhered to these recommendations and implemented the changes in accordance with the reviewer’s suggestions.

Limitations: Was non-response bias investigated? Did the characteristics of non-responders differ from the study sample? Why were no demographic details on the participants presented e.g. gender, proportion of local versus international students etc? Please remove the term "advanced statistical analysis" from this paper.

Few demographic details were included as the target population was small and we did not want the responders to feel that they could be identified. This also means that the knowledge about non-responders is limited. We have elaborated on this in the Limitations section, p 16. The term “advanced statistical methods” has been deleted.

Why were independent evaluators not used? Bias and influence over students of the research team/faculty (and how this was minimised in this study) need to be discussed as a limitation of this study. The authors chose a web-based survey to gather feedback. Please discuss the limitations of selecting these methods to gather feedback versus other methods in this section.

We have elaborated further on methodological shortcomings in the Limitations section, p 16.
Competing Interests

Please revise this statement. The authors should recognise that their role in the development of and teaching this course is a competing interest in this study. Declaring no competing interests is not appropriate. The role of the funders of this evaluation needs greater consideration also as a competing interest.

Point taken! The competing interests statement has been changed in accordance with the reviewer’s suggestion.

Reviewer #3: Review of ms IMPS-D-17-00187 This is a good article providing data of a five years’ experience of an annual doctoral level course on implementation science. The manuscript responds to the call from editors of the Implementation Science Journal for more data on evaluation of implementation science courses and it could potentially be a good fit for the journal. However, I suggest some edits below.

Thanks for the positive words on the paper. We have made many changes to the manuscript, which hopefully will improve the paper.

First, the authors mention IRI, the National Institutes of Health and Veteran Health Administration in the United States, Trinity College in Ireland, and Radboud University in Nijmegen, Netherlands as examples of training in universities. The IRI is a NIH and VA funded training but not for graduate students (see Proctor et al., 2013 and Luke et al., 2016). The IRI as well as TIDIRH (and MT-DIRC) are programs for faculty-level fellows, which is not the same target population as the participants described in this study. If the authors compare their program to IRI, TIDIRH and MT-DIRC, it would be nice to have a couple of sentence justifying for the training at the graduate level instead of the faculty level as it is done with these three institutes.

Some more information on this has been added to the Background section, p 3-4.

I am unsure about the Trinity Collegue and the Radbound University, but it would be nice to have citation to those programs, if available. The evaluation of another program for master and doctoral students has just been published in Implementation Science, and it may be cited (Ullrich et al., 2017).

A reference to the Ullrich article has been added.

In terms of the introduction, it would have been nice to have more details about the Kikpatrick and Kickpatrick evaluation model for a reader that is unfamiliar with it. The authors describe it on page 6 but maybe the description could be beneficial to the reader if done earlier?

We did consider this, but felt an elaboration of the model in the Intro would “detract” from the main focus of the paper and “jeopardize” the funnel structure. Therefore, we would like to keep
the description of the Kirkpatrick model in the Methods section. Also, the model is widely used and described in the scientific literature for those interested in using it.

In terms of the methods section: it would be nice if there is citation regarding the PBL method and its evidence for the approach for other people that may want to replicate the methodology. A citation is given at the end of the paper, on page 13. It would be useful to have it at the beginning.

The citation has been added in the beginning of the paper.

Data analysis: can the authors describe some more what they mean by "inspired by Graneheim and Lundman"?

OK, “inspired by” here means that we followed the steps described by Graneheim and Lundman, but as the data were quite limited the method was not fully applied. The sentence has been changed and now reads: “using the basic components of qualitative content analysis described by Graneheim and Lundman”, p 10.

Results: Do the authors have descriptive data of the students?

Few demographic details were included because the target population was small and we did not want the responders to feel that they could be identified. This is now elaborated on in the Limitations section, p 16.

As for the Discussion: I am unsure if implementation science is a new field more so than it is an evolving field. It may also be that it is challenging because scientists training in IS are probably located in "hubs", making it difficult to reach doctoral students from universities that do not have infrastructure supporting IS work.

True, we agree.

In the discussion, the authors mention the Self-Determination Theory and some of its components to explain the results. As it is written right now, it seems as an after-thought: is the Self-Determination theory used in the preparation of the course? If not, how could the authors capitalize on the findings and on the theory to plan future courses?

The SDT did not explicitly influence the development of the course, but we were aware of the main “message” of the theory, which therefore may have had a more informal, implicit influence on the course. SDT will be of use for future development and planning.

Some of the descriptions of the course, provided in the discussion, could be useful for the reader if given at the beginning of the paper.
Thank you for making us aware of this. Some of this information has been moved from the Discussion and placed in the Methods section.

For discussion: what are the next plans? Is this an ongoing course? Could the authors correlate their findings with other outcomes (as they mention) such as papers (if applicable)?

We have added some information about the future in the Discussion section, p 15.

In summary, I do think that this is a good paper for the IS journal, but it would benefit from some editing and more information about the program.

Thanks for the positive words. Hopefully, the changes we have made will improve the paper.