The Thicker Red Thread: sewing together many lecturers and topics into one cohesive course

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Environmental Epidemiology is multi-threaded

At the University of Copenhagen, the course Environmental Epidemiology (SMKK09001U) is a second-year study programme for Masters of Environmental Science and Masters of Global Health students. For some of the approximately 20 students typically enrolled over each of the past few years, this programme is compulsory. While many of these students will not aspire to be environmental epidemiologists, they may work in fields that collaborate with environmental epidemiologists or use evidence collected through environmental epidemiological studies.

The course covers principles of environmental epidemiology, including study designs and biostatistics. However, it also includes a range of diverse topics on environmental exposures (e.g., air pollution, noise, heavy metals) and health outcomes (e.g., birth defects, cardiovascular disease, hormone disruption). This diversity is addressed by employing multiple experts internally (Section of Environmental Health) as well as externally (e.g., Aarhus University and Rigshospitalet).

The book *Teaching Epidemiology* (Ahlbom, 2015) provides a guide for teachers in epidemiology, public health and clinical medicine, emphasizing that environmental epidemiology often encounters situations in which multiple exposures occur, and must be considered. Herein lies the challenge of delivering coherent learning-objective outcomes across a course and into final (summative) assessment.

This particular challenge was highlighted in student feedback of the current course's formal evaluation, with potential solutions suggested in conversation with the head of study and the previous course responsible (who was asked to review the project at-hand) to be done.

> "The general 'cohesiveness' could be improved. I find it can be hard to spot how the individual sub-elements by the different teachers all come together to form a bigger picture." – quote from student during previous (2024) formal evaluation.

Thus, this project aimed to develop the weaving of an explicit "red thread" through the course, at the introductory lecture and continuing through each diverse topical lecture (delivered by different experts). As such, it was proposed that the course responsible illustrate coherency between all topics in their relation to the final (oral) assessment (for which students randomly pick one covered topic and answer specific questions in relation to designing a study on that topic) by the following objectives:

1. Spend ~15 minutes at the beginning of the 135 min introductory class to overview course learning outcomes, and relevancy of each topic for study design at oral examination, and;
2. Spend ~5-10 minutes at the beginning of each 135 min class to:
    a. Re-cap on the previous topic, and;
    b. Tie the previous topic into the current topic.
3. Probe informally of the problem for the students throughout the course, keeping a record of any comments made to this effect.

Weaving of the Thicker Red Thread

To meet the primary objective (*Objective 1)*, I delivered a summary slide in the introductory lecture, being the course responsible, to link the diverse topics delivered by different invited experts (lecturers) (*Figure 1*).

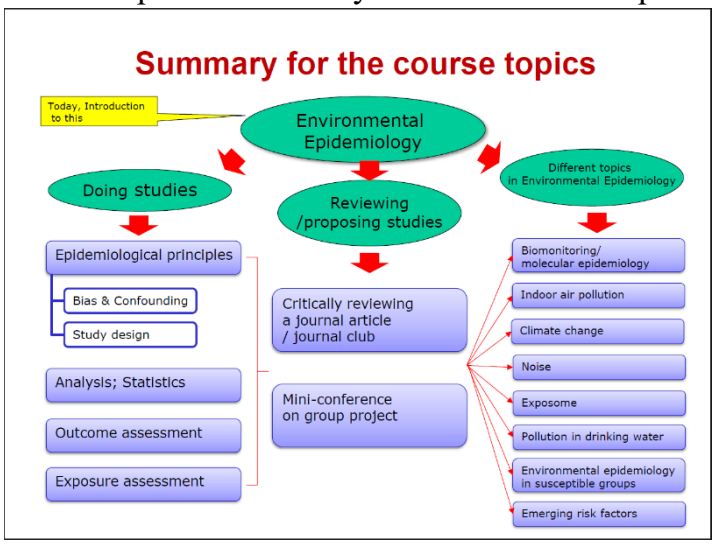

Fig. 1. Relationship between diverse range of topics delivered by different experts within Environmental Epidemiology (SMKK09001U) at University of Copenhagen, Denmark. * Screenshot of a PowerPoint slide delivered during the introductory lecture.

To assess the implementation of this project proposal, and meeting *Objective 2*, I then looked for student responses on the identified problem in the informal mid-course evaluation (2025), with a specific open-ended question on this issue, which I have full control over (being an informal evaluation made by me as course responsible, rather than the University's formal evaluation): "What is working well, and what could work better?"

This data is: quantitative in terms of the number of students commenting positively/negatively to the specific question posed on this issue, with other students able to up- or down- vote the student comment, and; qualitative in terms of open text comments related to this issue. See *Table 1* for a summary of the mid-course evaluation comments.

Table 1. Summary of student responses from informal mid-course evaluation

What is working well?[a]	# Up-votes[b]	What could work better? [a]	# Up-votes[b]
Group discussion was comfortable	2	Class cohesiveness could be improved	3
Interactive elements of class appreciated	2	Emphasis on parts relevant in the exam	3
Intended learning objective was clear	1	Clearer group work expectations	1

Source: This qualitative (responses) and quantitate (up-vote) data was collected during the 2025 mid-course evaluation of Environmental Epidemiology (SMKK09001U) at University of Copenhagen, Denmark.

a. Responses made as comments using Padlet Wall functionality

b. Up-votes made as reactions using Padlet Wall functionality

An added comment to the response "cohesiveness of class could be improved" is as follows:

> "I find it nice that (the course responsible) does try to help us with this." – quote from student during current (2025) mid-course evaluation.

Following the oral exam (final) assessment results, a formal end-of-course evaluation will be performed by the University, from which I will

be better able to assess the efficacy of this project (and meeting *Objective 3*) – how well the students found cohesiveness throughout the entire course, and how it prepared them for the final assessment.

Re-spooling the Thicker Red Thread

As course responsible, I should know how students understand as to why a course runs the way that it does; in the current project, why so many diverse topics are covered and for that reason include multiple guest lecturers. The reason this is done is because Environmental Epidemiology is the study of the distribution of disease as a result of our environment – environmental exposures do not exist alone, and so studying outcomes can be complicated as some exposures lead to the same health outcomes. This is highlighted in the book *Teaching Epidemiology* (Ahlbom, 2015), which provides a guide for teachers in epidemiology, public health and clinical medicine. Ahlbom emphasises that environmental epidemiology often encounters situations in which multiple exposures occur. Therefore, it is important that we have a grasp of all potential exposures and confounders/covariates, especially when designing robust studies, which is a requirement to perform well in this current course's final assessment.

From the textbook *University Teaching and Learning* (Lotte Rienecker et al., 2019), I have reflected on 'the didactic triangle' (page 95), focusing on relationships between the three elements of students, teachers and content. The course in question has many lecturers with varied backgrounds, which might lead to inconsistencies in teaching and assessment practices. Additionally, a lack of the (biennial) end-course evaluation of the previous iteration of this course (2024) has meant that feedback on the effectiveness of changes was not systematically collected (although will be in 2025). Instead, I attempted to standardize certain aspects of the course delivery and assessment to ensure consistency. Concretely, I attempted to develop a common framework for all lecturers to follow, including key learning outcomes, assessment criteria, and teaching methods. This was to ensure that all students receive a consistent learning experience, regardless of the lecturer. However, this was met to different degrees by the different lectures, seemingly driven by experience of the lecturer and presumably willingness to try new things.

Also of relevance is *Enhancing Teaching-Learning Environments in Undergraduate Courses* (Dai Hounsell, 2006), which discusses the relationship between assessment and feedback, course organisation and management, and curriculum, aims, scopes and structure (*Figure 2*). Addressing this, I attempted to manage the course's many lecturers with varied backgrounds in terms of expertise and experience to also facilitate opportunities for students to get familiar with the oral exam format. In addition, at the beginning of each class, I (the course responsible) recapped the previous class and tied it into the new knowledge content and how it all flows into assessment. While the curriculum as such is not set to have students pass the assessment (in the current course's case, an oral exam), the students need to be able to demonstrate that they fundamentally understand the academic subject knowledge which is the curriculum. In this case, for students to pull together diverse topics to design an environmental epidemiological study, and with that be prepared to enter the workforce either as an environmental epidemiologist or someone that works with them or their evidence generated.

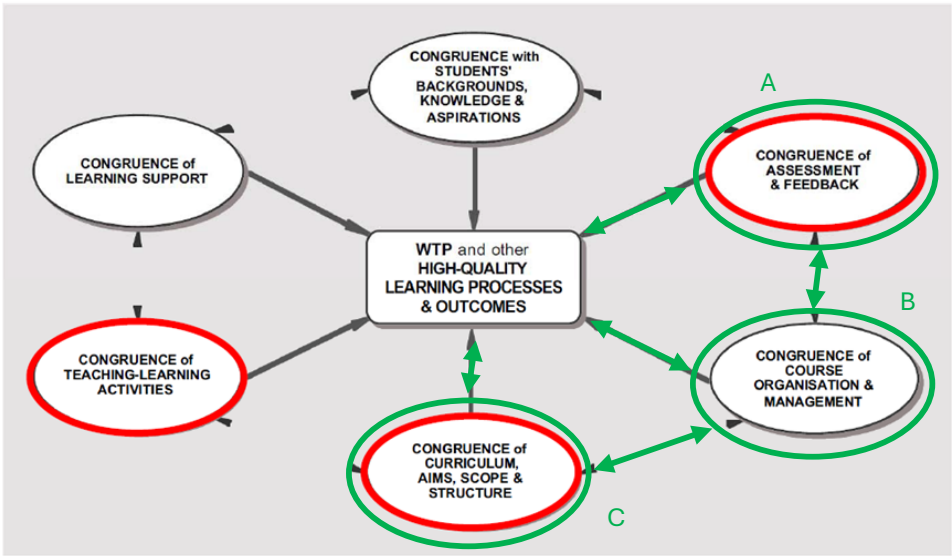

Fig. 2. Relationship between assessment and feedback, course organisation and management, and curriculum, aims, scopes and structure within Environmental Epidemiology.

* This is a modified version of a template for the development of teaching and learning activities aiming at first-year students (Dai Hounsell, 2006).

Discussion

A post-course review meeting was held following exams, during which the course responsible debriefed eight lecturers on course development, the informal mid-term evaluation, and exam performance. Time was allowed to discuss how to restructure the course and produce a thicker red thread, as a more consistent approach to delivering specific topics by different lecturers. One lecturer, a toxicologist rather than epidemiologist, suggested they would step-down to allow more time to cover epidemiological principles; they felt that their content (biomarkers in toxicology) was no longer aligned with the course development. This idea of reducing the number of lecturers and their expertise topics will be considered further going into the next iteration of the course.

Moving forward, as a specific suggestion made and supported at the post-course review meeting, I would create Class Pages on Absalon for all topics, and this can be provided as a template by the course responsible for all other lecturers to use as a guide. The Class Page content could then be consistent, with the template completed by all lecturers for each lecture topic. Moreover, at the top of each class page can the course responsible provide points as placeholders which can be used to thicken the red thread, tying together the different topics delivered each time; referring to this at the beginning of each lecture, when the course responsible overviews course learning outcomes, and relevancy of each topic for study design at oral examination.

In summary, I can recommend the following. Lecturers and topics should be minimized, without losing real-world relevancy for the students, in which the study of environmental epidemiology is multi-faceted (i.e., multiple co-exposures and body systems potentially affected. Student-facing class information should be made as consistent as possible, so that despite different lecturers with different backgrounds or levels of pedagogical experience, the students always receive the same information and more easily see the red thread.

Altogether, I have learned that while there is no one ‘correct’ way to conduct a course, there are better ways to align the expectations of the course responsible, the course lecturers, and the students to meet learning objectives and ultimately be best prepared for final examination.

Conclusion

In conclusion, coordinating a course such as this is challenging; however, seemingly simple steps can be made to ease the challenge. The course responsible, course lecturers, and students should be aligned as much as possible for all to feel and follow the red thread. Undoubtedly, weaving a thicker red thread for this course will take several more iterations, perhaps more as a creative art form than a strict pedagogical science.

References

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