

## **Going deeper than common sense – revision of the exam in the course Public Health and Nutrition based on peer teacher discussions and constructive alignment theory**

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### **Introduction**

As a teacher and examiner on the master's degree course "Public Health and Nutrition" in 2010, I found that the format and content of the final oral exam made it difficult to test students' knowledge and their ability to apply it adequately. The curricular exam questions appeared to me superficial and easy, and did not allow us to assess deep learning, despite the fact that the intended learning outcomes (ILOs) for the course (Appendix A) included competences at the highest levels of the SOLO taxonomy (Biggs & Tang 2007). In spring 2012, I was one of the persons responsible for the course and it gave me a chance to try and improve the exam.

### **Aim**

The aim of this project was to revise and evaluate the oral exam in Public Health and Nutrition in order to:

- Improve the alignment of the exam with the predefined ILOs
- Put more focus on assessing deep, functioning learning, not just declarative, surface-oriented learning.

## **The course Public Health and Nutrition**

Public Health and Nutrition is a compulsory 7.5 ECTS course at the master's degree education in Human Nutrition at the Faculty of Life Sciences, University of Copenhagen. It is conducted in Danish and consists of theoretical lectures and guest lectures where current public health interventions are presented. A major activity is a group assignment in which the students have to design an intervention to solve a public health challenge, using the planning model Logical Framework Approach (LFA). The course also includes a stakeholder document which the groups have to revise and update regarding the role of stakeholders in the field. This document is part of the exam curriculum. The final summative student evaluation is a twenty-minute oral, individual exam with no materials permitted. It consists of a five-minute presentation by the student of their LFA report, five minutes discussion of the report, and five plus five minutes exam on two short curricular questions, without time for preparation. Due to university regulations, we were not allowed to change this overall four-part examination format.

### **Approach**

#### **Ideas from Professional Learning Communities and Constructive Alignment**

Since I was one of four persons responsible for the course, I decided to use structured peer group discussions with my colleagues as a means of planning, implementing and evaluating revisions to the final exam. This type of teacher team work in order to improve students' learning borrows elements from the professional learning communities (PLC) described by Stoll et al. (2006) and used in some public Danish schools. The key elements and strengths of PLCs are to build among the teachers (and others involved) shared strengths and visions, a collective responsibility, a reflective dialogue about teaching practices, collaboration, and to improve learning, not only among the students, but also among the teachers (Stoll et al. 2006). Building a PLC would be far too elaborate for the scope of the present project. Rather, I borrowed elements from this way of thinking and tried to incorporate it in the way we worked with the course.

I decided to focus on the part of the exam concerning questions from the general curriculum, not the LFA part. An important aspect of constructive

alignment is to make sure not only that the exam reflects the ILOs, but also that these are aligned with the teaching and learning activities used in the course (Biggs & Tang 2007). Although some adjustments were made to the teaching and learning activities of the course, the main focus of this project will be on the curricular part of the final exam.

### **Empirical method**

Based on my previous reflections and last year's course evaluation, I made an outline for the semi-structured peer group discussions (Appendix B). Three key areas were considered: Format and coverage, deep versus surface learning, and alignment. I participated in the discussions, took notes and tape-recorded it all, to make sure I did not miss anything. Based on the key points of the first discussion, I made suggestions for exam revisions that I presented in overview and discussed with my peers.

My final versions of the curricular exam questions were tested during the June 2012 exam. Finally, the new exam structure and usefulness of the revised exam questions were evaluated in the third discussion session with my peers (Fig. 6.1). I also developed a simple questionnaire for the students to fill out immediately after the exam but before they received their grade (Appendix C). This was based on five-point Likert scales (Likert 1932) and had open fields for qualitative comments.

#### **Box 1: Empirical matter for this project**

- Last years' student course evaluation
- Semi-structured peer group discussions of exam questions
  - Before course start (discussion 1)
  - During the exam planning phase (discussion 2)
  - After the exam (discussion 3)
- Short anonymous exam evaluation questionnaire filled out by the students after the exam (before grading)

**Fig. 6.1.** Empirical matter for the project.

## **Findings and reflections**

### **Evaluation of previous year's course**

The course teachers stated that the previous year, the exam questions should have been better prepared, i.e. the examiner should check beforehand whether all aspects of the questions were indeed covered by the curriculum. A figure or picture used in the teaching could be shown in order to support the students. Some of the questions should be posed more specifically and we should try to write the questions during the teaching of the subject. The previous year's grade points were rather high; 55 % of the students achieved 10 or 12 and no one failed the course. The teachers stated that since half of the exam was based on the discussion of the students' own LFA report, it was hard to fail. When I raised this issue with my peers, we decided to assign only three minutes for the students' presentation of their LFA reports, and give us, as the examiners, more time to ask in-depth questions about the report. Here we would ask for critical views and draw in theoretical models.

### **Discussion session 1 and 2 – Teachers' identification of problems and potential solutions**

I started the first discussion session by showing the current ILOs of the course and of the whole master's degree in Human Nutrition. To our surprise, the majority of the intended competences of our candidates were based on learning from our course. In order to evaluate the alignment of the course, we went through each of the previous year's exam questions and discussed which of the course ILOs (Appendix A) they referred to. Overall, the exam questions were aligned with the course ILOs, but mainly at the lower taxonomic levels. However, the ILOs were rather broad and could be interpreted in different ways. As recommended by Grønbæk & Winsløw (2003), we decided that I should present and explain our interpretation of the ILOs on the first day of the course, to make the students aware of the demands of and competences given by the course.

A number of very ambitious key points appeared from the first discussion:

- Ideally, the exam questions should have both a specific part and a broader part.

- Some important aspects of the taught areas, which were not previously covered by the exam, should now be included (e.g. ethnic minorities and screening).
- Some exam questions were irrelevant or could be answered from common sense and were therefore removed (e.g. listing of UN organisations).

Most existing exam questions should be revised in order to:

- Be more specific (e.g. refer to specific points from a curricular article)
- Be more elaborate (e.g. include sub-questions) and clear
- Be more challenging (e.g. ask students to apply concepts to unfamiliar examples given in the question)
- Be more theoretically founded, and/or
- Demand answers at a higher taxonomic level i.e. include a more critical angle or analytical and discussing approach, not only the listing of things (Biggs & Tang 2007), and
- The questions should be posed in a way that corresponded to the way the material was taught in our adjusted course, e.g. by use of more examples, cases etc.

The revised exam questions were discussed in the second peer discussion, and were, after further changes, reviewed by two of my peers. The final versions of the curricular questions were tested during the oral exam in June 2012. I added figures to two of the questions, but found it unsuited to the rest of the questions. I supplied the exam questions with short answers in note format and with suggestions for extra questions that the examiners could ask within that theme, if time allowed. These were typically questions that invited discussion or comparison of concepts. Examples of old and revised exam questions are given in Appendix D.

## **Did it work?**

### **Students' evaluation of the exam questions (quantitative and qualitative)**

All students who took the exam filled out the evaluation questionnaire shown in Appendix C (n=48). In addition to their quantitative answers, most students wrote helpful qualitative comments in the open fields of the questionnaire.

In response to the statement “The exam question reflected the intended learning outcomes for the course” the median response among those who drew each of the questions were either strongly agree, partly agree or somewhere in between. The overall distribution of answers to this statement (Fig. 6.2) shows that very few students found that one of their questions were outside the scope of the course ILOs.

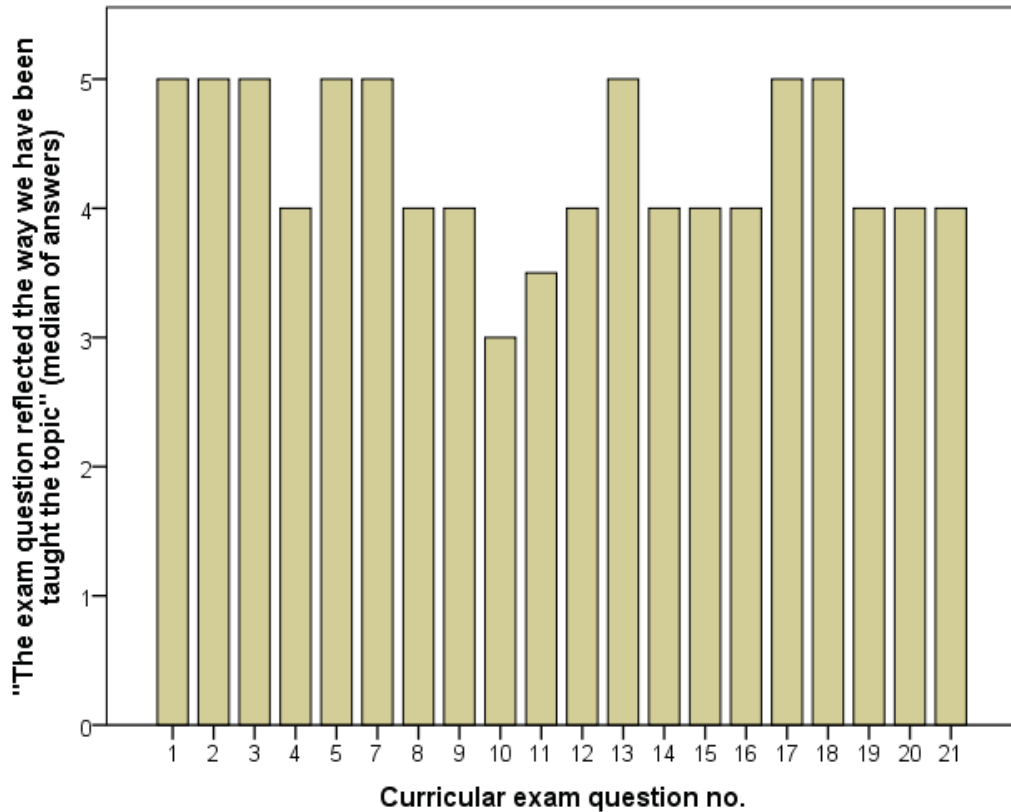
| “The exam question reflected the intended learning outcomes for the course” |    | “The exam question reflected the way we have been taught the topic” |    |
|---|----|---|----|
| Answer  | %  | Answer  | %  |
| Strongly Agree  | 54 | Strongly Agree  | 43 |
| Partly agree  | 36 | Partly agree  | 42 |
| Neither agree or disagree   | 6  | Neither agree or disagree   | 6  |
| Partly disagree   | 3  | Partly disagree   | 7  |
| Strongly disagree   | 0  | Strongly disagree   | 2  |

All students (n=48) drew two questions each (total N=96).

**Fig. 6.2.** Students’ answers after the oral exam.

Although a few more students disagreed that the exam question reflected the way they had been taught about the topic, 85 % agreed either strongly or partly (Fig. 6.2). However, when evaluating the answers for each exam question separately, I identified two questions (number 10 and 11) which seemed to get the lowest average scores on alignment (Fig. 6.2). These were case-based questions about stakeholders. According to the open field comments, the students were quite happy with these case-based exam questions, but they criticized that no cases, student exercises or discussions had been used in the teaching of the stakeholder document. As one student wrote: “Just writing about the stakeholders does not give the discussions I need for the exam”. When I presented this to my peers we decided to make a bigger effort next year to revise that part of the course, by use of cases, questions, exercises and a reduced curriculum in order to improve learning.

The qualitative part of the questionnaires also showed that the exam questions were much more specific than the students had expected. Specificity was actually one of the goals of my exam revisions. However, I think we could improve the way we prepare the students for the exam, since as summarized by Gibbs & Simpson (2004), clear goals and standards are



**Fig. 6.3.** Median of students' answers to whether the exam and teaching was aligned, for each of the exam questions. 5=Strongly agree, 4=Partly agree, 3=Neither agree or disagree, 2=Partly disagree, 1=Strongly disagree. The 21 exam questions were drawn between two and eight times each.

important for quality learning. As planned, I presented and explained the course ILOs to the students at the start and end of the course. Next year, I will try to be even more specific, give examples and ask how they interpret the ILOs – maybe make a mock exam for them with peer student feedback and assessment. We also agreed that next year we will put more emphasis on key concepts that we think are important for the students to study in detail and incorporate exercises in these concepts for them to practise their skills. I hope that this will create a positive back-wash effect (Biggs & Tang 2007) i.e. encouraging appropriate and ILO-oriented learning. Finally, some students noted that the exam questions were clear and easy to understand. I think this is very important.



### **Discussion session 3 – Teachers’ evaluation of the new exam questions**

At the final peer discussion session, I showed figure 6.3 and some of the students’ qualitative answers to my peers. This led to some very fruitful discussions about which particular teaching sessions should be improved and how. The main conclusions from the exam week and the final peer discussion were that the revised exam questions were well-structured and more aimed at testing the students’ abilities at different (and higher) taxonomic levels than previous years’ questions. Also, the extra questions (for the examiners only) were very helpful and all relevant parts of the curriculum were covered – and all but one question were covered by the curriculum. The extra time allowed for discussion of the LFA group report (now seven minutes versus five minutes the year before) worked well. However, we also identified a number of things that we would change in next year’s questions, after trying them in practice. It was difficult for my peers to assess (and remember) whether this year’s exam made it easier to distinguish the academic level of the students compared with the last year. This year’s median grade point was quite high (7.9) but only 39 % of the students received the grade 10 or higher, as compared to more than 50 % last year. As last year, I think this is partly due to the fact that half of the grade is still based on their discussion of their LFA report. However, I also think this indicates that the design-oriented LFA group report is something from which the students gain a lot.

### **Other observations and reflections**

It struck me that, despite our focus on the ILOs, we examiners did not always agree on what a good answer was. Although most students could give a theoretical definition of the concepts, they differed in their ability to apply, exemplify and use them. I think that no matter how well you design your exam questions, your ability to discriminate a candidate’s academic level depends on your own definition of knowledge and your questioning technique. Another problem I find hard to overcome is that none of us found time to read the full curriculum before the exam. This is to me a structural issue that has to do with the way teaching is weighed against research and production of articles in the university system.



## Conclusions and perspectives

By use of peer teacher discussions and student evaluations, I have identified some key points for improvement of the oral exam in our course, in order to improve assessment of deep learning and constructive alignment. The revision and testing of the exam showed overall a high degree of satisfaction from the point of view of the students and indicated that the exam questions had improved in terms of structure and assessment of learning at different taxonomic levels. However, the student evaluations and peer discussions also showed that parts of the course could benefit from further revisions in order to improve alignment and student learning and clarify the expectations for the exam.

Personally, I found peer teacher discussions a highly useful way of evaluating and improving course planning, while at the same time creating ownership, engagement and new common insight among the teachers. This is in line with the strengths of PLCs described by Stoll et al. (2006). Also, I was positively surprised by the enthusiasm my peers put into the process – despite its demanding and time-consuming nature.

## **A Intended Learning Outcomes for “Public Health and Nutrition 2012”**

(Translated from Danish.)

After the course the students should be able to:

### **Knowledge**

- Describe basic concepts and strategies in public health science, with special focus on nutrition and health.
- Describe the processes behind the planning of public health interventions in the field of nutrition
- Identify central public and private stakeholders within nutrition and demonstrate overview of their responsibilities in Denmark

### **Skills**

- Apply theories on the planning of preventive strategies and interventions and demonstrate the ability to conduct a needs analysis, define goals, identify determinants for the behavior of the target group, choose relevant methods and evaluate the intervention.
- Compare and evaluate nutrition and food policies, nationally and internationally

### **Competences**

- Discuss interests related to the production of policies of relevance to nutrition in the Danish population
- Critically evaluate central concepts and existing interventions in the health area
- Plan a health-promoting intervention by use of an acknowledged planning model, e.g. the Logical Framework Approach.

## **B Peer discussion guide**

### **Format and coverage**

- Does the exam have the relevant format (within the regulations) or what could be improved?

- Are all the relevant areas and concepts taught during the course covered by the exam?
- What is missing and what do we need to cover?
- How should these potential new questions be asked?

### **Deep learning vs. surface learning**

- Are the curricular exam questions testing the students' ability to define, describe, list, identify and the like? (uni- and multistructural understanding in SOLO) or rather to apply, analyse, characterize, compare, create, design and invent? (relational or extended abstract)
- Should this be changed?
- Are the curricular exam questions relevant for the things we want the students to be able to do after taking the course?

### **Alignment**

- Are the curricular exam questions aligned with the intended learning outcomes (ILOs)?
- Which are and which are not?
- Do the exam questions reflect the content and the form of the teaching during the course?
- What improvements could be made in order to make the exam questions reflect the ILOs?
- Should any improvements be made in the content and format of the teaching in order to improve alignment?

## C Student questionnaire

### A. My first exam question had number \_\_\_\_\_

1. The exam question reflected the intended learning outcomes for the course (**put one X**)

- Strongly Agree
- Partly agree
- Neither agree or disagree
- Partly disagree
- Strongly disagree

2. The exam question reflected the way we have been taught the topic (**put one X**)

- Strongly Agree
- Partly agree
- Neither agree or disagree
- Partly disagree
- Strongly disagree

**Please comment:**

### B. My second exam question had number \_\_\_\_\_

1. The exam question reflected the learning objectives for the course (**put one X**)

- Strongly Agree
- Partly agree
- Neither agree or disagree
- Partly disagree
- Strongly disagree

2. The exam question reflected the way we have been taught the topic (**put one X**)

- Strongly Agree
- Partly agree
- Neither agree or disagree
- Partly disagree
- Strongly disagree

**Please comment:**

## D Examples of old and revised exam questions

Translated from Danish

### Example 1: Public Health Diseases

Old Question:

Give examples of the most important risk factors for public health diseases in Denmark

Revised question:

Public Health Diseases

- What characterizes a public health disease?
- Discuss why prevention of public health diseases is a national responsibility

### Example 2: Stakeholders

Old Question:

Name the most important UN organizations who are involved in nutrition

Revised question:

Hip fracture and stakeholders.

A mentally healthy and well-functional 70-year-old woman falls in her home and is hospitalized with a broken hip. Analyse who has the economic responsibility for

A ...her hospitalization

B ...her recreation after discharge

C What other stakeholders would it be relevant for the woman to contact after her discharge from hospital?

### Example 3: Ethnic minorities

There was no old question in this theme.

Revised question:

Ethnic minorities, diet and health

- A What are the most common diet related health problems among fugitives and immigrants in Denmark?
- B Discuss problems in relation to giving advice to parents of ethnic minority about their childrens' diets

All contributions to this volume can be found at:

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