19

Evaluation and suggestions for redesign of Basic Histology with a focus on constructive alignment

Lise C. Berg

Department of Basic Animal and Veterinary Sciences, SUND, University of Copenhagen

Introduction

As a consequence of cut-backs in 2011, Basic Histology (part of the first-year veterinary course, "Cell Biology, Basic Histology and Basic Genetics") was placed in our group shortly before the start of the course. I was put in charge of organizing this part of the course and the exam. Two other teachers participated in the course. The course is an integrated part of the veterinary curriculum and the former professor had been responsible for the course for several years including course description, aims, exam form, lectures and exercises. The course consists of twelve two-hour lectures and twelve two-hour histology exercises (microscopy) with a class size of approximately 190 students. The exam is a two-hour written exam consisting of seven questions that counts for one-third of the total grade for the course. Note: The curriculum is defined by a list of intended learning outcomes (ILOs) and is not a traditional textbook-based curriculum.

Aim of project

To evaluate the current course, and to prepare a revised version of Basic Histology with focus on constructive alignment.

Methods

The project is based on student evaluations, teacher evaluations, exam results, and personal reflections and experiences. For each of the three main areas – ILOs, teaching and learning activities (TLAs), and exam form – the original version is presented followed by results of the evaluation process and a suggestion for revisions. In conclusion, the constructive alignment is evaluated for the original version of the course and the revised version.

Results and discussion

Intended learning outcomes – course curriculum

Original version

The curriculum was outcome-based, not due to pedagogical considerations but because the available textbooks were deemed either too substantial or too lightweight. The ILOs followed the course plan lesson by lesson.

Evaluation of 2011-2012

The list of lLOs was a useful tool in preparation of lectures. However, the lLOs were inconsistent – the level of detail varied substantially between topics, and for some topics there was a very strong commonality with Physiology, which is clearly outside the scope of the Basic Histology course. The phrasing of the ILOs could be improved. The verbs used were from the lower levels of the SOLO taxonomy scale (Structure of Observed Learning Outcome) (Biggs & Tang 2007), which made some of the lLOs more like check lists. It could be argued that some of the lLOs were phrased in such detail that they potentially left little room for independent thought or reflection (Andersen 2010).

The student evaluations showed that the students were very happy with the ILOs, and how they were used for most lectures. They found that the lLOs made revising for exams much easier. The course took place from November 2011 to January 2012, and the students were therefore not only novices to the subject, but also to university level studies in general. In addition, this was their first experience with not having a clearly defined textbook-based curriculum. The students did not express a desire for a more

traditional curriculum. We took on the course very late, and thus we decided to keep the lLOs unchanged due to lack of time for a proper revision. However, more problem-based ILOs were added to individual lectures as a supplement to the official curriculum during the course, but with a very clear distinction between official lLOs and supplementary ILOs. Basic Histology is a descriptive basic topic in the area of anatomy, and the subject does not automatically lend it self to deep reflections and problem solving, but it is possible to find examples from the clinics or whole-animal functionality that can form a basis for more problem-based teaching. It is always nice to receive positive student evaluations, but it is worth considering whether they in part reflect the fact that the level of detail of some of the ILOs was so high that they were more like check lists.

Suggestions for revised version 2012-2013

We have decided to keep the ILO-based curriculum based on the evaluations of both teachers and students. We have revised the list of ILOs in collaboration between the three teachers using our experiences, results from the evaluations, and suggestions from the literature (Biggs & Tang 2007, Derstine 2002). The lLOs have been aligned to the course description. Overlaps to other courses have been minimized, and the detail level has been evened out between subjects. We have attempted to optimize the phrasing and wording of the lLOs to move responsibility for learning away from the teacher and onto the students. The ILOs are still designed to follow the order of the lectures closely, and it could be argued that they are still too detailed. It would be interesting to apply more general lLOs or move towards a competency-based curriculum (Smith & Fuller 1994, Near et al. 2002). But for now we have decided to keep the outcome-based version, especially considering that the students have no prior experience with a non-textbook-based curriculum.

Teaching and learning activities

Original version

Every two-hour lecture was followed by a microscopy exercise. We are not sure which, if any, TLAs were included in the lectures in the old format. The ILOs and course description were not formulated to include defined

TLAs. In 2011-2012 we included some TLAs in the lectures, but the concept could definitely be expanded. The microscopy exercises followed a standard protocol adapted to each subject. An additional TLA was included in one microscopy exercise.

Evaluation of 2011-2012

The addition of more problem-based ILOs to selected lectures encouraged the use of TLAs including solving clinical cases (e.g., bone marrow transplant and DNA testing), reflecting on whole-animal functions (e.g., vascular system in the giraffe), and developing diagnostic skills (example: differential cell count). The students were very cooperative and motivated, and in their evaluations they highlight the TLAs.

Suggestions for revised version 2012-2013

Based on the revised ILOs the use of TLAs can and should be expanded. The TLAs from 2011-2012 are easy to implement in 2012-2013, so it will be the responsibility of my colleagues and I to pass on teaching materials (if we are not teaching the course again). It could be argued that the microscopy exercises are all a type of TLA and one additional TLA was used in the microscopy exercises last year with very positive feedback. However, emphasis should be placed on the development of TLAs for the lectures.

Exam form

Original version

The exam took the form of a two-hour written paper consisting of seven questions and exercises with three to four subquestions – no aids were allowed. The format of the questions had been standardized over past years. Each question represented a tissue or cell type usually accompanied by a histology image, and the students were asked to identify or describe histological structures. The exam was placed after Block 2 (January 2012), and the students had one additional exam during that exam week.

Evaluation of 2011-2012

The format of questions was very straightforward and did not encourage reflection or more complex problem solving. They were however very easy to score which should not be ignored when the class size is 190 or more. As a teacher it was discouraging to have tried to encourage the students to reflect on issues during the course and then test them this way. We had decided to leave the exam form unchanged for similar reasons to the unchanged lLOs (see above). An additional advantage for the students was that the exam resembled the exams from previous years, both with regards to form and degree of difficulty. The evaluation from the students was that they found the exam somewhat disappointing and unsatisfying. It has to be emphasized that the pass rate and average grade were very high and above those of previous years, so any discontent was not founded in poor performance. The students were not in agreement as to whether they had found it too easy or too quick to solve, but there was a definite impression that they would have appreciated an opportunity to show more knowledge. To ensure that the degree of difficulty had not been lowered I checked with our external examiner, who has been the examiner on the course for many years. He confirmed that the degree of difficulty was not changed. I questioned the students a little more closely, and an additional factor was that we apparently had succeeded in making the students interested in our course, potentially at the cost of the other course examined at the same time, where the pass rate was lower that previous years. An additional reflection I would like to put forward is the dilemma highlighted by our experience this year. What is the purpose of the exam? To test the students to make sure that they have acquired the desired skills and knowledge, to scare the students into studying because they know they will be tested, or to give the students an opportunity to assess whether they have the skill set required for the next courses?

Suggestions for revised version 2012-2013

Based on the revised ILOs it should be possible to move the format towards more problem-based questions. The basic skills acquired by the students in Basic Histology are very descriptive and this should definitely be tested, but a compromise could be to use the traditional straightforward structure questions but add a more reflective question at the end of each subject. It is very important that the degree of difficulty remains the same. A restructure

of the veterinary curriculum has meant that the students will be examined in three and not two courses in the exam week after Block 2, which needs to be taken into account especially when we evaluate the outcome of our changes to the exam form and the course in general.

Constructive alignment – a brief assessment

Basic Histology is a basic course in anatomy, in which the students are expected to acquire, among others, knowledge in tissue and cell structures, skills in microscopy, and competences in assessing, discussing, and describing cellular and tissue structures independently and in collaboration with fellow students (excerpts from course description 2011).

The course is part of the bachelor's degree in veterinary medicine. During the degree programme the students are expected to acquire, among others: knowledge in basic methods, structures, and principles in the core elements of the study programme, skills in utilizing basic principles, terms, and methods; skills in performing microscopy, in identifying changes to structures, in searching for and evaluating literature and references, in communicating the field to peers and the general public, and in use of information technologies; and competences in identifying and discussing veterinary issues, reflecting on scientific and ethical topics, participating in inter- and cross-disciplinary collaborations, working independently and assuming responsibility for their own actions, and to acquire new knowledge and take responsibility for their own learning (excerpts from study programme description 2011).

Basic Histology is a very small course in the degree programme, and thus its role in fulfilling the aims of the entire bachelor in veterinary medicine is minor. It must be considered more important for the course to fulfil the expectations listed in the course description, while not forgetting the overall aims.

Original version

In the course description terms like describe, identify and gain experience with are used frequently. The original lLOs used terms like describe, identify, understand and know, and the exam form and questions were designed to test this. Thus the ILOs, exam form, and type of exam questions comply with the course description. However, the listed competences, including assessing and discussing, are not implemented in either lLOs or exam form

in my opinion. In this version it is the sole responsibility of the teachers to ensure that all the aims – especially the competences – of the course are fulfilled.

Revised version

The revised ILOs still make use of the terms from the course description including describe and identify, but we have replaced the terms understand and know, and included terms like relate, explain, assess, and discuss. This will hopefully move responsibility for learning towards the students, while also implementing the competences listed in the course description. The TLAs mentioned previously will further this, but since they are not an integrated part of the course description, it will be the responsibility of the teachers to include them. The revised ILOs create the opportunity to make changes to the exam form, while still maintaining alignment between course description, ILOs, TLAs, and assessment.

Conclusions

Basic Histology has always been a relatively well-functioning course receiving good evaluations from students and good overall results regarding pass rates and average grades. However, an evaluation of the course helped us to identify a number of places, where the course could be optimized. Some changes were implemented immediately and were thus part of the course in 2011-2012, but additional changes have been suggested in this project report and will be part of the course in 2012-2013. These include a revision of the ILOs, which form the basis for the course curriculum, suggestions for TLAs mainly for the lectures but also for the practicals, and finally a change in the exam questions while staying within the boundaries of the current exam form. The revised version of the course appears to be better aligned with the course description while leaving more room for reflection and discussion. More radical changes could have been proposed, but it is an on going process and additional changes will likely be implemented when we have evaluated this version of the course.

All contributions to this volume can be found at:

http://www.ind.ku.dk/publikationer/up_projekter/2012-5/

The bibliography can be found at:

http://www.ind.ku.dk/publikationer/up_projekter/

kapitler/2012_vol5_bibliopgraphy.pdf/