Course analysis of HT18-5HI001 course

After the course has ended, the course leader fills in this template. This is an important part of the quality assurance of the programme. The programme director decides whether the template should be supplemented with further information/questions.

Course code 5HI001	Course title Computer Applications in Health Care and Biomedicine (10hp)	Credits 10
Semester 1	**Period** 2	

Course leader Stefano Bonacina	Examiner Sabine Koch
Other participating teachers Sabine Koch, Tanja Tomson, Vasilis Hervatis	**Other participating teachers**

Number of registered students 46 * * The 1 student of 9HI001 is included in the 46	Number passed after regular session 32	Response rate for course survey (%) 23.91 %
Methods for student influence other than course survey Feedback and comments on the schedule and the agenda.		

Note that…

This analysis shall (together with a summary of the quantitative results of the students course survey) be submitted to the LIME educational committee.

This analysis have been submitted to the LIME educational committee on this date:

1. Description of any implemented changes since the previous course based on previous students' comments

In the previous course evaluation, "I received critiques from the students, mainly concerning:
- Contents of lectures on technical subjects perceived difficult;
- Little amount of practical activities in the classroom;
- Referencing style"

By transformative reflection, some changes have been implemented since the previous edition of the course. First, as for "**Contents of lectures on technical subjects perceived difficult**", contents of technical subjects have been delivered according to the flipped classroom strategy by mean of movies recorded for the "eHealth – Opportunities and

Challenges" MOOC course, developed at the Health Informatics Centre. In that way, the time devoted to the frontal instruction depended on how much the student grasp the subject. For example, a MOOC video could be played and discussed in the classroom. Other videos have been selected from YouTube to present research project on "robots and elderly for independent living" ("Giraff Plus" and "Victorya Home 2014") and telemedicine ("2009 – Georgia State Telemedicine initiative"). The number of hours devoted to technical lectures was rationalized according to the students' preferences. In addition, lectures' handouts have been provided to the class before lectures, so the students had an additional media to follow the lectures.

However, I would have some additional reflections for future improvements. It appears some basic concepts have not been gathered as required to perform the first assignment. I am going to emphasize that a Glossary of terms is available in the text book (the mandatory literature) and propose a list of terms that has to be known. Materials on basic concepts of a subject can be provided as well. However, whether students study it before the related session is hardly to estimate.

As for the "**Little amount of practical activities in the classroom**", specific sessions have been devoted to practical activities (data modelling; modelling of systems and processes in healthcare according to Unified Modelling Language diagrams; specifically, Class Diagrams and Object Diagrams). In addition, in a session devoted to Clinical Decision Support, a class activity on the extraction of rules from clinical practice guidelines has been performed. The exercises developed in the class were similar in complexity to the ones assigned in the first assignment.

A session on moral dilemmas and ethical issues has been provided as group activity in the class, including a final discussion.

In the class, twelve hours have devoted to the Group activity on Public Health Informatics (PHI) projects.

Referencing style. It appears the issue about "Referencing style" has been solved, compared to last year. The format to be applied to the citations of the "Reference list", in the assignments of the course is according to "Writing references" web page of KI Library (https://kib.ki.se/en/write-cite/writing-references). To format the citations, students can practise the KI Library tool at: https://tools.kib.ki.se/referensguide/vancouver-en/

2. A brief summary of the students' evaluations of the course

(Based on the students' quantitative answers to the course evaluation and comments. Quantitative compilation and possible graphs attached.)

Eleven (11) out of 46 students have completed the course evaluation survey. Seven students have clinical background education, and one has technical background education, according to the collected answers. For each question of the survey, mean, standard deviation and coefficient of variation, as a percentage, are presented in Table 1.

In Table 1, the mean value of the answers ranges from 2.3 to 2.9, while the standard deviation ranges from 0.9 to 1.3. Finally, the coefficient of variation ranges from 38.1 to 52.4 per cent. From those numbers, it appears students' views are quite heterogeneous.

In the following part I have listed comments from the students to improve the course, describing the comment and adding some reflections and possible actions to take. The comments are related to Alignment to SUPCOM course, Engaging students and Content Delivery, and Instruction for the assignment.

Alignment to SUPCOM course. Students ask for having more connection with SUPCOM course, i.e. "Supplementary Course in Computer and Systems Sciences - Health Informatics (SUPCOM-HI)" course. To prepare that edition of the course I was not able to go through the materials of SUPCOM course (for some technical reasons, I did not get the access to the course material). However, to prepare the course I referred to the materials of the previous edition of SUPCOM course. The modular structure of SUPCOM-HI HT17 was as follows: 01-Module1 - Enterprise Modelling and Software Engineering; 02-Module2 - Database Methodology; 03-Module3 - Human Computer Interaction (HCI); 04-Module4 - Programming; 05-Module5 - Computer Systems; 06-Module6 - Information Security;
Module 1, 2, and 5 were the ones more connected to the present course.
It appears Unified Modelling Language – UML lectures/ learning activities are perceived useless; however, the models in the assignments were not according to the requests (12 students had to amend, see below).
Then, as for the alignment with SUPCOM course, I think more can be done. In a separate document, I have listed the topics students should know before attending the present course.

Engaging students/ content delivery. A couple of comments were about students' engagement and content delivery style, and how to maintain engagement during the day (as generally there were 5 hours lecture in a day). In the section entitled "5. The course-responsible conclusions and any proposals for changes" some proposals for changes are described to enforce the student engagement and to get/delivery feedback in order to assess the understanding on the given contents.

A comment was that the **instruction for the assignment** should have been clear. However, the comments did not explain what is unclear or "stressful" and for which assignment. The text of the assignments is organised according to an introductory text and then specific requests are asked, according to a list. I would like to add that it appears the students do not know the purpose of the criteria of assessment and how they are connected to the text of the assignments. The Criteria of assessment for the assignments were published before the beginning of the course, and they are available on the website of the "HT18 5HI001 Computer applications in health care (10hp)"course on Ping-Pong ("Criteria of assessment" menu item). Then, the criteria of assessment were presented in the introductory lecture on 3rd December 2018, and they are also in the presentation you find on Ping-Pong ("00 - Introduction" menu item, "01_Introduction_181203.pdf" file, page 34). The criteria of assessment were available from the beginning of the course, presented in the introductory lecture.
The instructions of the assignment are the tasks a student has to do. The criteria of assessment explain how those tasks are assessed, and the students are advised about them from the beginning of the course. The expectation is that students are aware of the criteria of assessment when they prepare their assignments.
Then, I would like to add that the text of the assignment is in some points general, as the student has to reflect and propose a reasonable solutions, analysing advantages and disadvantages. The requests of the assignment cannot be a plain checklist merely. In fact; the

Intended Learning Outcomes (ILOs) of the course related to the "understanding" are defined according to the high levels of "SOLO" taxonomy (uni-structural, multi-structural, relational, and extended abstract). As a consequence, the assignments have to show reasoning and critical thinking of the students.

#	Question	Mean	Standard Deviation	Coefficient of Variation (%)
1	In my view, I have developed valuable expertise/skills during the course.	2.3	1.2	52.4 %
2	In my view, I have achieved all the intended learning outcomes of the course.	2.9	1.1	39.1 %
3	In my view, there was a common theme running throughout the course – from learning outcomes to examinations.	2.8	1.2	41.4 %
4	In my view, the course has promoted a scientific way of thinking and reasoning (e.g. analytical and critical thinking, independent search for and evaluation of information).	2.9	1.3	44.7 %
5	In my view, during the course, the teachers have been open to ideas and opinions about the course's structure and content.	2.3	1.0	44.4 %
6	Teaching was based on real examples to develop students' professional knowledge.	2.3	1.0	44.4 %
7	This course built on knowledge I had acquired during the programme's previous courses.	2.5	0.9	38.1 %
8	My previous knowledge was sufficient to follow the course.	2.8	1.2	41.4 %
9	The course was challenging enough for me.	2.5	1.2	47.7 %

Table 1. Summary of the students' evaluation of the course.

3. The course-responsible reflection on the course implementation and results

As for the implementation, the course was composed by four different parts, as follows:
- General part (Health informatics) (G), basic health IT tools to develop e-health systems;
- Clinical Informatics (CI), health care organisations point of view;
- Consumer Health Informatics (CHI), involving the patients as active components of the healthcare system;
- Public Health Informatics (PHI), a population level view.
Those parts include study visits and guest lecturers from external organisation. The students have appreciated that.
Practice sessions have been given to prepare the students to the first assignments, and three entire days have been devoted to the group project, in the classroom, to help the students with the second assignment, and the group assignment on Public Health.

Some aspects can be improved. Being the class numerous and composed by international students, express concepts in way they can be understood in the same way is challenging, as the heterogeneous background of the students. As mentioned earlier, glossary of fundamental concepts of the topics of the curse can be provided the students. In the section entitled "5. The course-responsible conclusions and any proposals for changes" some proposals for changes are described to enforce the student engagement and to get/delivery feedback in order to assess the understanding on the given contents.

As for the results, the students have shown their ability to face problems within the subject, and propose reasonable solutions. 32 out of 46 students (69.56 %) passed the course after regular session, i.e. with both the assignments passed without amendments. The first assignment has been passed by 32 students, while the second assignment has been passed by all the students. Two students (4.35 %) have not yet submitted assignments (at the time of writing this report).

Course strengths:
Study visits and guest lecturers;
Class activity and Group project on Public Health;

Course weaknesses:
Student engagement and content delivery;
Connection with SUPCOM course.

4. Other comments
At the beginning of the course, I usually ask the students their expectations. Unfortunately, it appears difficult to have an answer other than "pass the course". This aspect affects "Student engagement" as knowing their expectations more focussed examples on their specific interest could be provided.
Then, I am very sorry about a comment I received. Though the comments include some typos, it appears it express I have insulted some students. This is not true. I would like to add some reflections on that, from practical experience. At KI, a three-year long course TEAK is offered to teaching staff that is giving their teaching in English. I have attended that course. I was wondering if a similar course can be proposed to students as well. A title could be *L*EAK "Learning" in English at Karolinska Institutet. Subjects of the course could be about the specific terms used in education, e.g. intended learning outcome, constructive alignment, assessment and assessment criteria, and feedback.
Finally, I have a comment on the theories and modern technology. However, I was not able to fully understand it. The request was to explain theories with modern technology, but which theories and what have to be considered modern technology have not been clarified.

5. The course-responsible conclusions and any proposals for changes
(If any changes are proposed, please specify who is responsible for implementing these and a time schedule.)
For the course, changes at syllabus level have not been proposed. However, the comments from the students and the reflections from the course-responsible allow updating some

aspects of the new edition of the course (semester HT19). It has to taken in account that the new group of students could have different perspectives compared to the current one.

In addition, for the tuning of the lecture materials, a more significant connection with SUPCOM course (fall semester 2019) is helpful.

As mentioned earlier, I would also like to add something on how to improve engagement and content delivery. In the course, specific terminology is used; this has to be a common language; however, the same terms are used differently depending on cultural or educational background. Harmonisation of the terminology is needed. To this end, in the classes, group activities to practice specific topics of health Informatics (e.g. medical data and how they are stored in computer systems, modelling clinical databases, modelling healthcare processes, consumer health mobile apps, public health informatics applications) are given. As the topics earlier mentioned are subjects of the course assignments, it is useful that the students practice on those subjects, without being worried about the grading.

Class activities, based on group work and peer reviewing between groups, will be proposed as ways of imparting knowledge and learning (and engaging students, as well). These two ways have been combined in order to delivery feedback to the students (on a subject matter and on the language). During the activity, students receive feedback from the other students (peer reviewing) and from the teacher. Then, the teacher asks for and receives feedback by a summative evaluation, e.g. by using "Went Well" (WW) and "Do Differently" (DD) sticky notes. The concept of feedback has been introduced because according to current research in higher education, it appears that shall be the basis on which to shape educational programmes and courses, i.e. the leverage of imparting knowledge and learning [1]

Some preparatory work has to be done before proposing that activity. First, the concept of feedback has to be presented to the students and discussed at the beginning of a course ("what feedback is and how it would be received /should be given") [2], in an introductory lecture. Secondly, "There are many cultural expectation linked to teaching and learning"[2], for example, in some cultures, feedback is given using direct language, while in other cultures that way would be considered impolite [2], as indirect language is commonly used. So, it is important to guide the students in giving feedback. Thirdly, to avoid negative impact on student confidence, defining the language for giving feedback is crucial. This aspect relates to the teacher, but also to the students (because of the international classroom) [2], and how different cultures cope with feedback. Finally, the proposed class activity is significant as it allows giving feedback at the time, i.e. not distant from the learning activity itself, as recommended by pedagogical studies [2]. Indeed, the learning activity is also shaped on giving-receiving feedback.

So, feedback on a subject matter and on how to give feedback (language skill) would be provided during the activity. Peer-review, i.e. students are giving each other feedback, would help in creating a harmonised class.

The course director is responsible for the changes. As for the time schedule, those changes can be applied in the next edition of the course.

References

1. Boud D, Molloy E. Rethinking models of feedback for learning: the challenge of design. Assessment & Evaluation in Higher Education. 2013;38(6):698-712.
2. UoL Productions. Valcke J. What are the best tips regarding feedback for multi-cultural groups? [Online, 2016] Available at URL: https://www.youtube.com/watch?v=BFfS9iluZVs Accessed: 11 February 2019.