Teaching Quantitative Exercise Courses (2)

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Feedback and Assessment

Overview

1. Feedback
2. Assessment

1. Feedback

Appropriate feedback supports student learning (see articles on feedback, especially Teacher Feedback (https://infopool.univie.ac.at/en/home-page/feedback/teacher-feedback/)).[1] Courses with continuous assessment, that are exercise classes, provide a suitable framework for giving students **improvement-oriented feedback** throughout the semester. Thus, students receive feedback on completed work, and they have the opportunity to incorporate the feedback in subsequent assignments.

The following list contains different possibilities for feedback in quantitative exercise courses:[2]

- **oral feedback** during class (e.g. on frequent mistakes);
- **written comments** on student (homework) assignments;
- **one-on-one conversations** during office hours;
- completed **feedback sheets** based on criteria previously communicated to students;
- written **collective feedback**;
- written **model solutions** with comments;
- **teacher solves the problem on the board** and provides explanations.

Feedback methods work either in **analogue** or in **digital** form (on **Moodle**). The latter include written collective feedback, but also other time-saving formats such as oral feedback, which you may provide **as audio or video files on Moodle**.

Students can give feedback to their peers on appropriate homework problems or other exercises. If you choose to use peer feedback in your course, make sure you have explained the **procedure,** as well as your expectations for **student behaviour** and **communication**, since providing feedback is a skill that students may have yet to learn.[3]

2. Assessment

Since quantitative exercise courses use continuous assessment, a student's grade is determined by more than a single test or exam. Multiple assignments provide teachers with a more objective basis for assessing student performance, which is important, as quantitative knowledge and skills that students have to learn are usually complex.

Using previously defined and communicated **criteria** is helpful for evaluating and discussing students' performance and **grades** with students (see Assessing Exams (https://infopool.univie.ac.at/en/home-page/assessment-grading/assessing-exams/)). If you are free to design your own course, make sure your assessment activities correspond to your **intended student learning outcomes** (https://infopool.univie.ac.at/en/home-page/teaching-learning-at-the-university/perceived-self-efficacy/), i.e. that they indeed assess what students should have learned in your course.

Students learn better when they have several **options for practising** what they have learned and for **reviewing their learning progress**.[4] Such exercises are also informative for instructors. At the same time, we recommend you create additional learning opportunities that are either **not graded** or contribute **very little** to the final grade (low-stakes testing or low-stakes assignments). Even in the case of traditional homework, you may allow students to drop one or two less successful homework assignments. Students benefit from **non-graded learning opportunities** in which they are able to make mistakes without having to fear a bad grade as consequence. Instructors benefit from a reduced workload, since they won't have to assess every single student performance.

In addition, you may rely on a series of **classroom assessment techniques (CATs)** that provide you a quick overview of your students' learning progress. Examples of CATs on the subject of mathematical thinking are available here: Classroom Assessment Techniques Mathematical Thinking (http://archive.wceruw.org/cl1/flag/cat/math/math/math1.htm).[5] Students also benefit from **self-checks**, which you can implement as ungraded tests on Moodle.

References

[1] See „Feedback-Policy of the University of Vienna", ctl.univie.ac.at/fileadmin/user_upload/z_ctl/Feedback/Feedback-Policy_final-1-2_EN.pdf [05.02.2021]

[2] Cox, Bill, and Michael Grove. *Teaching Mathematics – A Guide for Postgraduates and Teaching Assistants*. The Maths, Stats & OR Network, 2012, p. 74 ff. https://www.birmingham.ac.uk/Documents/college-eps/college/stem/additional/Teaching-Mathematics.pdf.

[3] Nilson, Linda B. „Quantitative Reasoning and Problem Solving". In *Teaching at Its Best: A Research-Based Resource for College Instructors*, 3rd ed., 192-98. San Francisco: Jossey-Bass, 2010; here 196-97.

[4] Henry L. Roediger, III. „Applying Cognitive Psychology to Education: Translational Educational Science". *Psychological Science in the Public Interest* 14, No. 1 (2013): 1–3. doi.org/10.1177/1529100612454415.

[5] See Ridgway, Jim, Malcolm Swan, and Hugh Burkhardt. „Assessing mathematical thinking via FLAG". In The Teaching and Learning of Mathematics at University Level: An ICMI Study, edited by Derek Holton et al., 423–430. Kluwer Academic Publishers, 2007. doi.org/10.1007/0-306-47231-7_37 (https://doi.org/10.1007/0-306-47231-7_37).

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