# Students’ perceptions of how feedback affects their mathematical knowledge and test anxiety

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This presentation explores students’ perceptions of a teacher-developed feedback method. Many adults in Sweden attend mathematics at Municipal Adult Education to qualify for further studies, but a significant number fail to obtain a degree. Providing specific feedback can help students to succeed. In this action research project, students receive tailored materials that address topics they failed in written tests. After studying the materials, they can try again. They can write or explain their solutions to the tasks orally directly to the teacher. Semi-structured interviews were conducted with ten adult students. Thematic content analysis revealed that students perceived improved performance on previously failed topics and reduced test anxiety.

## Background

Adult education differs from other forms of education in many ways: the courses are conducted at a high pace and often offered in both on-site and distance formats and the students’ study routines and previous knowledge diverges (Wallin, 2019). Many students in adult education have bad experiences studying mathematics and show low self-esteem, and accordingly, mathematics is the subject with the highest failure grades and most drop-outs at Komvux (Municipal Adult Education in Sweden) (Dahlberg, 2021). When formative feedback is used in education, it is a strong explanatory factor for students' achievement (Hattie & Timperley, 2007). This is important as grades in mathematics are a gatekeeper for further studies and employment (Safford-Ramus et al., 2016). Therefore, it is of specific importance to study formative feedback methods that have potential to improve mathematics education for adults. In this presentation one such feedback method is in focus: Take Two: a Chance to Re-Do.

## A short description of the feedback method: Take Two: a Chance to Re-do

When a student fails a written summative test, the teacher identifies what specific topics the student needs to improve and provides the student with materials tailored for restudying those specific topics. When the student feels ready to be tested again the teacher gives him/her a couple of tasks during an ordinary lesson. The student can choose to solve the tasks in writing or to explain the solutions orally, depending on his/her preference.

## Aim and research question

This study examines how adult students perceive a specific feedback method. More precisely, the research question is: How do students perceive the opportunity to use *Take Two: a Chance to Re-Do* in relation to their mathematical knowledge and test anxiety?

## Theoretical background

The study is framed in a subject didactical perspective focusing on the interaction between student, teacher, and subject matter (Kansanen & Meri, 1999): the choice of activities and teaching approaches influences how the subject matter appears to those studying it. Teaching that consistently pays attention to how exercises and activities in lessons contribute to learning, is beneficial for students’ knowledge development (Hattie & Timperley, 2007).

## Methodology

The study is part of an action research project (Skolfi dnr. 2021-00061), where a practicing teacher and a researcher collaborate. Qualitative data was collected through semi-structured interviews with ten students taking the Mathematics course 2, at Komvux. Through thematic content analysis (Braun & Clarke, 2006) the following themes were created, changes in study techniques, knowledge, self-esteem, and in test anxiety. The study follows the ethical guidelines for Karlstad University (HNT 2022/40).

## Results

The study is a work in progress, tentative results indicate that the students perceive; a decrease in test anxiety, that the structure helps them to study more efficiently, and that they understand the failed topics better after the feedback received through Take Two.

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