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## Enabling Innovation in Engineering Education by providing Flexible Funds for teaching Staff

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**H**igh quality Engineering Education is the key to master the challenges of tomorrow. Universities need to adjust their curricula to current requirements to overcome the global shortage of engineers. TeachING-LearnING.EU supports them in identifying and achieving the necessary steps. The subject center for higher engineering education was founded in 2010 by the three universities RWTH Aachen University, Ruhr University Bochum and TU Dortmund University. Right from the start

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TeachING-LearnING.EU implemented a funding concept which allows engineering teaching staff to apply for financial support to implement innovative teaching ideas. Each semester, there is a call for ideas. The ideas are evaluated by TeachING-LearnING.EU, and the best applicants receive a funding of up to 30.000 EUR over a period of one year. The money can only be invested in staff costs. By the end of April 2012, 22 innovative teaching projects will have been supported by the Flexible Fund Program.

There is investment and benefit for all involved parties. Chairs and Institutes, whose staff receives funding, still need to invest manpower and additional money as the funding regularly does not cover 100% of cost. In addition to financial funding they benefit from competent consulting and sustained improvements in teaching and learning strategies. TeachING-LearnING.EU invests money in funding but the Subject Center's central goal goes beyond financial support: They give the faculties' teaching staff help and advice in didactical questions and - this is the main point - scientifically evaluate the funded ideas. This makes a central contribution to scholarship of teaching within TeachING-LearnING.EU's sphere of activity. The evaluation concept focuses on the impact the funded ideas have on teaching and learning in engineering education. It has three target levels: On the highest level the ideas are evaluated with regards to their contribution to the general goals of TeachING-LearnING.EU, e.g. implementing the shift from teacher centered to student centered courses. On the second level evaluation focuses on the aims of the Flexible Funds concept, e.g. increasing the teaching staff's motivation to experiment with new approaches in teaching. On the most detailed level the ideas are evaluated with regards to their explicit goals and if these are reached.

From these first observations we extracted many results and aspects for the new funding phase. Basically all the projects successfully introduced new and mostly student-centred teaching concepts in their courses. Teaching staff showed a high motivation for these changes and realised that depending on the intended learning outcomes group-work or project-work have advantages in comparison to classical lectures. The team of TeachING LearnING.EU will henceforth encourage the staff members to develop evaluation criteria in a manner that students see themselves as co-creators of new teaching environments and have that role in mind when they give feedback. It can be stated that the students' and the teaching staff's feedback addressed all three levels of evaluation. Over all, the results show that we are on the right track in supporting the shift from teaching to learning in engineering education from all points of view. Especially the students approved in the new course concepts a high relation to practical application, a coherent connection of theory and practice, the intensive dialogue between teaching staff and students, and working autonomously on different topics with their teams.

For the future possibilities of keeping up the didactical support for the projects even after the period of financial funding need to be considered. This would help to coach the teaching staff more intensively and to support them in keeping up their good work. A future alternative to the financial support would be to provide a different kind of long-term support, such as coaching or workshops on a frequent basis and on relevant topics. Additionally, the moderation and advisory service of TeachING-LearnING.EU as external experts will stay useful for the staff. In order to develop a system of self-renewing study courses (learning curricula) it remains to be seen whether the instrument Flexible Funds should be maintained within the faculty's budget in the future. Thus, a long-term and sustainable incentive for the improvement of teaching could be provided. It will be interesting for TeachING-LearnING.EU to evaluate how strong the impact of the previously funded projects is going to be within their faculty. The goal of triggering a snowball effect could be verified in cycles with short interviews with the former participants on an annual basis. ■