



The role of lecturers in engineering students' personal development process and the promotion of lifelong learning competencies

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Professional engineers need to continuously update and up-skill their competencies, to keep pace with the changing technology and shifting requirements of the labour market (European Commission 2019). Educating resilient students requires a university setting that makes them aware of their professional identity and trains them in continuously re-inventing themselves (Knapper and Cropley 2000). Hence, the educational challenge is not only to prepare students for a specific career but also to build foundations for a lifetime of learning (Kamp 2016). Although teaching staff often acknowledge the importance of Life Long Learning (LLL) competencies they do not necessarily feel adequately prepared to support students' personal development and lifelong learning skills. However, to support students and prepare them for a life of LLL, lecturers need to be more systematically and explicitly engaged in the students' personal development process.

Lecturers' ability to support students' career development is related to academics' attitudes and beliefs, teaching and learning approaches, as well as the challenges met by the staff (Amiet et al. 2021). In the contemporary rapidly changing world, engineering graduates emphasize the need for generalist competence, interpersonal skills, and constant learning over formal credentials and specific technical competencies in securing employment (Nilsson 2010). Academics also perceive that enhancing students' general skills supports their career development more than focusing on specific careers (Amiet et al. 2011).

Research has shown that different pedagogical approaches influence engineering students' development of self-regulated learning and, by extension, lifelong learning skills differently. Problem- and project-based learning tend to promote metacognitive self-regulation, critical thinking, and help-seeking, whereas lectures with active learning activities promote more effective use of time and study environment. (Lord et al. 2012.) Some assessment and grading approaches even seem to undermine the types of goals associated with self-directed learning (Stolk et al. 2014) and may thus even inhibit the development of LLL competencies.

Although many academics recognize that they have a role in students' career development, they also call for the responsibility to be shared among students, lecturers, and professional staff. Lecturers with limited work experience outside university especially felt that they lacked confidence in supporting students' career development. Many academics also felt guilty for not being able to meet the students' expectations for support. They suggested that the responsibility for supporting students' career development should be better acknowledged in academic job descriptions and promotional guidelines, as well as being supported with faculty and university-level resources. (Amiet et al. 2011.)

This workshop launched the Erasmus+ TRAINeng -PDP project which focuses on how we can help students develop LLL competencies and support lecturers by designing and creating appropriate training materials. To begin, we needed a collection of perceptions regarding the role, responsibilities, resources, opportunities, and challenges of engineering lecturers to support the students' personal development process and a lifelong learning attitude. Hence, we called the SEFI community for assistance. The results of the workshop will inform the pilot projects, attitudinal survey, and training materials which will form the outcome of this project.

The workshop consisted of a short introduction to the topic followed by collaborative work and discussion in groups in the form of a learning café. The discussions addressed questions: "*What could we do to support the development of students' LLL competencies?*" and "*What should we do to support the development of students' LLL competencies?*" Both questions were addressed separately from three different realms of lecturers' tasks, namely instruction, guidance, and assessment.



The workshop resulted in over two hundred ideas for and insights on supporting the development of students' LLL competencies in teaching. Discussions were conducted in six groups rotating the three aspects (instruction, guidance, and assessment). In the first round of analysis, ideas were grouped into 33 categories and then further into six themes. As the work still continues, the categories and themes may undergo some changes in the future. Current six themes 1) Planning for active learning 2) Training and supporting reflection, communication, and teamwork skills 3) monitoring and explicating learning 4) providing different forms of feedback 5) creating an inclusive, safe, and curious environment 6) Training lecturers, combine ideas related to all three aspects.

Planning for active learning entails suggestions for using active instruction methods, encouraging problem-solving, being innovative with assessment methods, choosing and searching for supportive materials, promoting cooperation among students, demonstrating professional skills to students, and involving students in planning the assessment. However, it also contains reminders of remembering the different dimensions of assessment as well as the need for balancing the course requirements and not just adding LLL objectives on top of everything else.

Training and supporting reflection, communication, and teamwork skills includes many different means for encouraging and helping students to reflect on their knowledge (or lack of it), learning process, perspectives, etc. Training for reflection, teamwork, and communication skills for learning but also for assessment is emphasized. Scaffolding for the development of different metacognitive skills is perceived to be part of the guidance.

Monitoring and explicating learning refers to the ways the lecturers can help students to understand learning as a process on a general and personal level. Communicating assessment effectively is considered important and providing role models and stories is thought to enhance especially students' attitudes towards LLL. Getting the right kind of information through assessment activities is also crucial for monitoring the students' learning processes.

Providing different forms of feedback in instruction, guidance, and formative and summative assessment is often brought up in the ideas. Valuable feedback can be received from the teacher, peer students, and through self-assessment or even from experts from outside academia. Enabling students to act on the feedback is often emphasized and especially peer feedback is seen as an important way to enhance students' evaluation skills.

Creating an inclusive, safe and curious environment is seen as a prerequisite for learning from mistakes, which is considered to be a powerful way to learn through reflection. An inclusive environment calls for the lecturers to see and value students as individuals, to value diversity, and demonstrate variety in their knowledge and opinions. Especially guidance by asking questions is seen as a powerful way to support students in developing their LLL competencies and especially questions and situations which stimulate students' curiosity are valued.

Finally, it is brought up that in addition to the students, also lecturers may need training and help in understanding and mastering the same skills, whose development they are supposed to scaffold for students. Especially help for conducting a meaningful assessment, discussing assessment with students, and training for reflecting on teamwork processes is suggested as resources for supporting students' LLL.

Asking about 'coulds' and 'shoulds' did not reveal any stark lines of division and it seems that many lecturers are willing to conduct the actions they deem necessary for supporting students. Lecturers seem to be ready to act as role models and also share their imperfections and learning needs with the students to show that also they need to engage in lifelong learning. This appears to be an excellent



starting point for our project aiming to help both students and lecturers in enhancing students' LLL competencies.

References

Amiet, D., Choate, J., Hoskin, J., and J. Dart (2021) Exploring attitudes, beliefs, and practices of academic staff towards undergraduate career development in non-vocational courses, *Higher Education Research & Development* 40:5, 885–900, DOI: 10.1080/07294360.2020.1799952

European Commission (2019) Key competences for lifelong learning, DOI: 10.2766/569540.

Kamp, A. (2016). *Engineering Education in the Rapidly Changing World: Rethinking the Vision for Higher engineering Education*. (2nd revised edition ed.) Delft: TU Delft, Faculty of Aerospace Engineering.

Knapper, C.K., and A.J. Cropley (2000) *Lifelong Learning in Higher Education*, (3rd ed.), Routledge, London: Kogan Page.

Lord, S.M., Prince, M.J., Stefanou, C.R., Stolk, J.D., and J.C. Chen (2012) The Effect of Different Active Learning Environments on Student Outcomes Related to Lifelong Learning, *International Journal of Engineering Education* 28:3, 606–620.

Nilsson, S. (2010) Enhancing individual employability: the perspective of engineering graduates. *Education + Training* 52:6/7, 540–551, DOI: 10.1108/00400911011068487

Stolk, J, Martello, R., Koehler, K., Chen K.C., and R. Herter (2014) Well, That Didn't Work. A Troubled Attempt to Quantitatively Measure Engineering Students' Lifelong Learning Development Over Two Years of College. *Proceedings of the IEEE Frontiers in Education Conference*, Madrid 22-25 October 2014.