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SAXION SMART SOLUTIONS

Interdisciplinary project-led education
The coaching role of the tutor

Irene Visscher-Voerman, Erwin van Harmelen, Sharon Holterman-Nijenhuis
Lectoraat innovatief en effectief onderwijs

Background and purpose

Professionals are increasingly expected to collaborate in interdisciplinary settings. Higher education institutes offer students opportunities to develop necessary skills, often in the context of project-led education. In such types of education, the role of the tutor is changing, from a focus on teacher-oriented teaching towards learner-oriented coaching, facilitating students' knowledge construction. Hardly any research focuses on how teachers apply this new didactical approach and how it impacts student learning.

In our research, we study how tutors in interdisciplinary engineering education take on the coaching role; how tutors and students value this coaching behavior as beneficial for student learning; and what support (new) tutors need to develop the coaching role.

Main research question

- How do tutors shape their tutoring role while coaching students in interdisciplinary project-led education within the Smart Solutions Semester and to what extent is this tutoring behavior beneficial for student learning, related to the three learning areas?

Context

Students work in **interdisciplinary project group,** in which they bring knowledge, skills and attitudes that stem from their own discipline and link these with knowledge, skills and attitudes of other disciplines to **develop innovative and sustainable "Smart Solutions"**.

The focus of the semester is on the development of **self-directed learning skills, a research oriented and inquiring attitude, knowledge construction**, and **collaborative learning and working**. The tutor is **learner-oriented** and has a facilitating and a coaching role.

Literature review

- **Interdisciplinary** = Combining knowledge and skills from two or more disciplines into a single project synthesizing knowledge and approaches when working on subtasks and the final product.
- **Multidisciplinary** = People of various disciplines working together on a project but still having separate tasks which are organized around the individual disciplines.
- **A directive teaching style** = The teacher decides for the student which content & skills needs to be learned and how learning takes shape.
- **A learner-oriented coaching style** = The students decide which content and skills need to be learned/developed, the teacher supports the students by for instance giving hints, monitoring learning or reflecting on student behavior.

- Recent research shows that : **even when their believes matched the underlying assumptions** of learner-oriented teaching, **most tutors still primarily showed teacher-oriented behavior** [1].
- Necessary competencies for a learner-oriented coaching style are **modeling, scaffolding, asking the right questions** [e.g. 2, 3], **monitoring the learning process** and **formative evaluation of process and product** [e.g. 2, 4, 5].

Methodological approach

- **10 tutors, with affinity for or background in technical domain**

- **Video recording** of one meeting between **tutor** and **students**.

- Selecting **6 segments** from this meeting, **3 in which the tutor shows learner-oriented behavior** and **3 in which the tutor shows teacher-oriented behavior**.

- **Semi-structured interview** with tutor **on tutoring behavior and the semester in general** combined with **reflection on tutor behavior** in selected segments.

- **Semi-structured interview** with focus-group of students **on tutoring and the semester in general** combined with **reflection on tutor behavior** in selected segments.

- Each filmed session was considered as being 1 case. Results of semi-structured interview with tutor and focus-group with students have been **summarized on a case level** after which **a cross case analysis** is being conducted.

Preliminary conclusions

- **Students struggle with using the expertise of the students from other disciplines** to enrich and deepen their own learning.

- **Tutors seem to value the semester higher than students**. Tutors focus on underlying intentions, students on practical issues.

- Tutors used directive behavior more frequently than supportive behavior.

- Some **clients show strict directive** behavior.

- Students appreciate tutors being more **directive at the start** of the project.

- Several of the student groups appreciate a tutor which gains **in depth knowledge beyond their own discipline.** It shows a tutor is interested in the project and allows the tutor to be beneficial to the learning process of the students.

- Several tutors **struggle with fostering knowledge exchange between disciplines**. The focus is primarily on development of a professional attitude.

- Projects mostly seem to have a **multi-disciplinary** nature, students working on separate tasks rather than on an integrated assignment. In cases where students worked on the same assignment, their disciplines were adjacent.

- **Sessions have great variety**: ranging from direct instruction, to a formal meeting, to an informal gathering. Focus could be on the working process, peer feedback, portfolio and assessment.

- Most tutors **value watching the recordings** as part of gaining further insight in their behavior as a tutor.

Data collection — Data analysis — Conclusions and report — Redesigning training sessions

March 2019 – May 2019   **June 2019 – July 2019**

May – June 2019   **September 2019 – end of 2019**

Sources:
[1] Assen, J. H. E., Koops, H., Meijers, F., Otting, H. and Poell, R. F. (2018), How can a dialogue support teachers' professional identity development? Harmonising multiple teacher I-positions. *Teaching and Teacher Education*, Vol. *73*, pp. 130-140.
[2] Savery, J. R. (2006), Overview of Problem-based Learning: Definitions and Distinctions, *The Interdisciplinary Journal of Problem-based Learning, Vol. 1, No.* 1, pp. 9-20.
[3] Donnelly, R. and Fitzmaurice, M. (2005), Collaborative Project-based Learning and Problem-based Learning in Higher Education: A Consideration of Tutor and Student Role in Learner-Focused Strategies, *In G. O'Neill, S. Moore & B. McMullin (eds), Emerging Issues in the Practice of University Learning and Teaching (pp.87-98)*, Dublin, AISHE/HEA.
[4] Blumenfield, P. C., Soloway, E., Marx, R. W., Krajcik, J. S., Guzdial, M., and Palincsar, A. (1991), Motivating project-based learning: Sustaining the doing, supporting the learning. *Educational Psychologist*, Vol. *26, No.* 3-4, pp. 369-398.
[5] Hmelo-Silver, C. E., & Barrows, H. S. (2006), Goals and strategies of a problem-based learning facilitator. *Interdisciplinary Journal of problem-based learning, Vol. 1*, No. 1, pp. 21-39.