TRAIN-THE-TRAINER CONCEPT IN HIGHER EDUCATION: LEARNING THROUGH COACHING

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ABSTRACT

The COVID-19 pandemic has brought universities to a new situation. Some students were unable to complete their internship or semester abroad as planned, and this led to an increase in the number of students participating in classes at their home institution. Also, the courses that used to take place in-person needed to be transformed to online courses with the consequent lack of the traditional interactions among students and lecturers, so new approaches, which are often supervision intensive, are needed to keep the students engaged. Therefore, we developed a Train-the-Trainer concept by designing a model based on coaching, peer-tutoring, and learning exchanges. Here we are expanding the traditional tutor concept to assure the following overarching goals:

1. Providing the course participants with intensive small-scaled supervision during the online teaching sessions
2. Giving more responsibility to more senior students, the 'Junior Coaches', to deepen their knowledge.

We have applied this model in two case studies and have evaluated the concept based on a Mixed Methods Research Design. The results showed that all three user groups of Lecturers, Junior Coach and course participants appreciated this approach.

INTRODUCTION – ELEMENTS AND GOALS OF PEER COACHING AND TRAIN-THE-TRAINER

The switch of traditional on-campus courses to online courses during the COVID-19 pandemic brought new challenges to universities. For example, the students' attention spans often decrease in online courses (Fergus, 2020; Rasto, Muhidin, Inayati, & Marsofiyati, 2021) and the traditional interaction between participants and the lecturer is missing (Ali, 2020; Crawford *et al*., 2020).

In the information age, students also need to acquire the 21st century skills to succeed in their careers. Creativity, critical thinking, collaboration and communication are considered as essential "learning skills" in this context (Care & Griffin, 2015; OECD, 2019; Virtanen & Tynjälä, 2019). Mastering these skills is not possible by just learning the theory, but by practicing the underlying methods and best practices in real-life projects in a group of students. Additionally, an essential element for learning is to practice regularly and receive continuous feedback (Pereira, Flores, Simão, & Barros, 2016). Therefore, the partial results obtained from regular practice should ideally contribute substantively to a larger real-life

project. One way to improve these skills in students is through our train-the-trainer approach, in which more advanced students from the same courses act as coaches or peer-tutors to support junior students through their learning journey.

We designed a concept for our ideas relying on the following **core elements** that show one possible future of education:

- **Learning by teaching and coaching**: students learn through support and instructions from more experienced students - the Junior Coaches.
- **Train-the-trainer**: Junior Coaches receive basic methodical training in the respective profession and regular coaching from the lecturers.
- **Reflection:** students and coaches critically reflect on their learning and teaching success in regular sessions.
- **Projects with purpose:** students work on team projects to gain practical knowledge and experience by applying the learnt theory on projects with social impact.

These elements offer a solid foundation to understand and apply the methods in real-life projects. This leads to a win-win situation for both coaches and those being coached. The safe educational space at universities gives the coaches the opportunity to try out different coaching approaches and to learn new skills for their future career. The junior students can learn from the coaches and get continuous feedback on their projects.

We have tested these elements in two lecture courses based on Design Thinking methods. In this article, we first explain our concept and the different learning levels. Secondly, we describe how this concept was implemented as case studies in two online courses during the COVID-19 pandemic. Finally, we evaluate this approach and share our experience.

DESIGN OF CONCEPT – FOR MORE ENGAGEMENT, DEEPER LEARNING

The concept, as a special form of peer tutoring (Abbot, Graf, & Chatfield, 2018; Topping, 1996), consists of two levels explained below (see *Figure 1*):

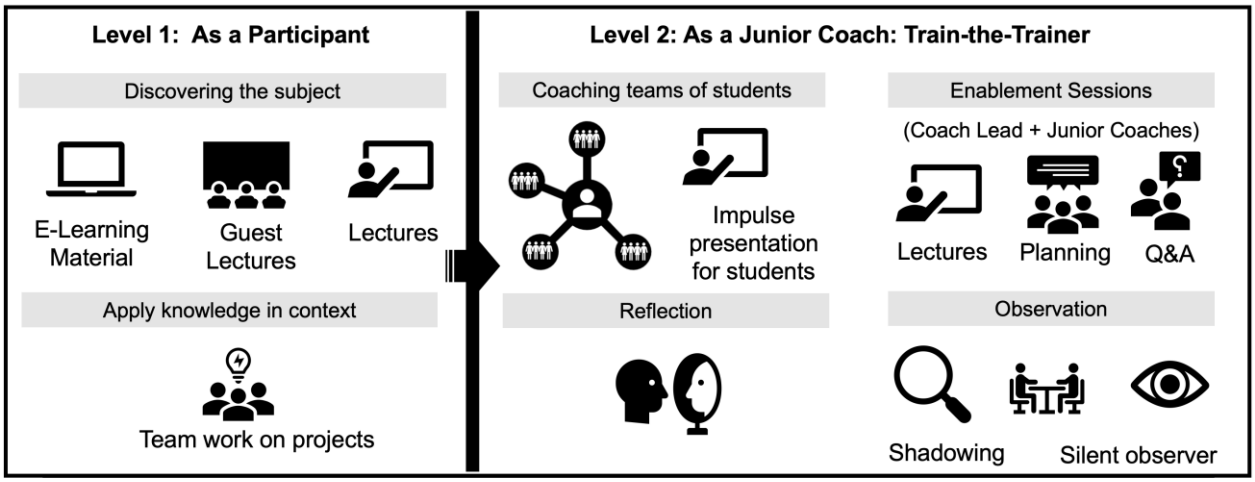

Figure 1: Trainers' Learning & Coaching Journey

Level 1 – Learning by participation: Discover and Apply

This level is about learning the theoretical knowledge and gathering experience about the topic as a participant first. The students should explain the essential terminology and understand and apply the methods of the subject. Consequently, our concept divides this level into two parts: Discovering and Applying.

Discovering the subject**:** The students learn the theoretical knowledge related to the subject. This can be offered as theoretical lectures in early semesters or as awareness workshops in companies. E-Learning material such as interactive learning modules can be provided here, too.

Applying knowledge in context: At this level project-based lectures can be conducted where the students work on projects together as a team and apply the theoretical knowledge gained during the *Discovering* phase.

After this level, students who are interested in being a coach and helping others in this area can become involved in the second level.

Level 2 – Learning by coaching: Empowerment and Reflection

In Level 2 Junior Coaches gain specific knowledge about the role of coaching on the one hand, and deepen their own knowledge about the subject related processes and methodologies on the other hand, by helping other students from the earlier semesters of the course to work on their projects and understand the topic. By imparting knowledge and supporting students in the learning process, Junior Coaches learn to understand and reproduce the subject matter more deeply. The learning objective of the junior coaches in this phase is to be able to convey one's own knowledge in the respective subject area of the lecture and to be able to guide students in their learning journey, as well as to reflect the learning success of their coaching group.

Activities at this level can be categorized as coaching, enablement, reflection and observation:

Coaching Teams: Junior Coaches take responsibility for supporting specific teams of students with their projects. They present inputs with tips and tricks that help students to apply the techniques properly. This includes in-class activities together with the participants.

Enablement Sessions: The lecturer in the role of “Coach Lead” provides support sessions for the Junior Coaches. These might include giving deeper insights into the topic covered by the lecturer during classes, discussing interesting examples or problems in the field or just answering questions arising from the lecture topic.

Reflection/Retrospectives: The Coach Lead meets with the Junior Coaches every week to discuss the planning and structure of the next coaching session and get some feedback from the Coach Leads. Here experiences from the last coaching sessions can be exchanged and reflected upon.

Observation: Using two observation techniques, inspired by the approach at HPI Institute (Plattner, Meinel, & Leifer, 2012; Plattner, Meinel, & Weinberg, 2009) and SAP, Junior Coaches can gain deeper knowledge in their new coaching role.

- Shadow a coach: The Junior Coaches can observe the lecturer while coaching and teaching the students, therefore learning different coaching and didactic methods.
- Silent observer: The Coach Lead observes the Junior Coach while s/he is coaching a team in a specific phase of the process and gives feedback about the things that could be improved or new / alternative ideas for presenting the material.

The authors have conceptualized and practiced this concept for two case studies that are explained below.

THE CONCEPT IN ACTION – OUR CASE STUDIES

We tried out this concept for two different lecture courses as case studies. In both cases students learnt Design Thinking as a methodology. While the first lecture course used Design Thinking as methodology as part of a module in "Software Engineering & Mobile Systems" the course in the second case study is dedicated specifically to Design Thinking. These settings are described in the table below.

	Case study 1: Software Engineering and Mobile Systems	**Case study 2: Design Thinking**
Major	Business Informatics	Software Engineering
Students in Lecture	90	65
Number of Junior Coaches	4, each dedicated to 4 teams for the entire semester	6, some dedicated to 4 teams, others to 2 teams
Team Size and Team Building	The students were divided into 16 teams of 5-7 people. They could decide themselves with whom they would like to work in a team. The only restriction was that the students from higher semesters needed to be in the same group.	Teams were built on Belbin (Belbin, 2011). Fixed team roles were specified for the whole first semester of the major. For this lecture we divided each team into 2 teams of 3-5 team members.
Content of the Lecture	The goal of the course is to teach students the theory behind the concrete mobile app development with the conceptional help of Design Thinking.	The goal of this course is to learn about Design Thinking with all its methods in each phase.
Project work in this lecture	The topic of the projects, the so-called Design Challenges, could be selected by the teams themselves. The challenges needed to be selected according to the 17 Sustainable Goals (SDGs)[17] of the United Nations.	Students could choose from "social challenges" such as "How could we help our region to be more attractive?" or "How could we attract the interest into technology of more female students?" They were asked to build real solutions and not just concepts or paper prototypes.

Figure 2: Case Studies and their setup

For this purpose, the general Train-the-Trainer concept had to be slightly adapted to the needs of the two courses. As part of the first learning level, all Junior Coaches were able to gain experience with the design thinking process as participants in the previous semester. For the second learning level in case study one, weekly training sessions were conducted with the Junior Coaches to reflect on the completed activities and to plan the activities for the next week. In the second case study, three retrospective workshops were organised to gather coaches' experiences and to reflect on coaching practice and work with student teams. Silent observation was conducted by the Coach Lead during various coaching sessions and during the Junior Coaches' momentum talks in both courses. The "Shadow a Coach" technique was only conducted in the first case study, when the Junior Coaches were able to accompany and observe the Coach Lead to learn from her during the planning and execution of a 3-day Design Thinking workshop. In the following section we will share the evaluation results.

[17] https://sdgs.un.org/goals

EVALUATION OF THE CASE STUDIES – METHODS & RESULTS

We applied a Mixed Method Research Design (Creswell & Creswell, 2017; Mertens, 2014) to evaluate the Train-the-Trainer model used in both case studies. One quantitative study was conducted to gather feedback from the course participants. A qualitative study was used to gather feedback from the Junior Coaches. This study included a survey that was filled out by 58 participants at the end of the semester. The qualitative study consisted of a semi-structured interview (Lune & Berg, 2017) with the Junior Coaches. Below we describe the results of the evaluation, and close with some personal remarks and suggestions.

The concept scales for large events, such as these two case studies with 90 and 65 students. Having the reflection and observation sessions with the coaches every week needed additional hours to be added to the original course hours; however, this extra time and effort helped to improve the course delivery and, in particular, made the courses more focused and student-centric. Dealing with the training concept helped lecturers to define the content of the course more precisely. The insights and perspectives of the Junior Coaches led to a better understanding of the learning processes involved.

In Learning Level 1 of our concept, we defined the part “Applying”. In our courses, this meant that students had to work on a certain project and take responsibility for the result. The result of the survey showed that 49 out of 55 students recommend keeping the concept of defining a large project for the whole semester for a team of students to work on it. The students mentioned in the survey that teamwork was one of the possible ways to motivate students for learning in the COVID-19 pandemic situation. They mentioned that it was more fun to work in a group, and they could gather more ideas and help each other with the topics. This gave them satisfaction and they learnt Design Thinking successfully:

> *To know that we could really solve an existing small problem was motivating*.
>
> (Student comments in the survey)

With the support of their coaches, students learnt to organize their teams. According to the experience of the Junior Coaches, the students were more comfortable raising questions to them rather than raising the question to the lecturer.

> *It's good to talk to people who have been through the same thing and know what's important*.
>
> *We can always bother them with "unimportant" questions. The fact that we are both students is very helpful. They tell us tricks and tips for the lectures*.
>
> (Student comments in the survey)

The results of the survey showed that the students were very satisfied with the support of the Junior Coaches in Case Study 1. Of 55 people who answered the question as to whether they would recommend keeping the concept of involving Junior Coaches, 47 participants answered ‘yes’.

Most of the students who did not select “very satisfied” in the scale mentioned as the reason that it was a pity that the support of the Junior Coaches was only provided for the Design Thinking process but not for the programming part. Students and coaches furthermore improved their ability to reflect upon their own work. The coaches had dedicated reflection sessions with the Coach Lead, while the students learnt this from their group work and the reflection with the Junior Coaches. The problem of supporting large number of students with the projects is solved to a great extent by delegating the tasks among Junior Coaches who can work in parallel during the lecture time. It was easier for lecturers to keep the progress of the teams under control and review. The regular documentation completed by the coaches was very helpful in allowing lecturers to get a quick overview every week about the progress of the teams.

The Junior Coaches helped to improve the course structure and material with their experience of being a student. They were a good bridge between lecturers and students in communicating the wishes of the lecturers and any problems experienced by students. The Junior Coaches could gain experience by coaching real teams working on different projects. One often learns at a deeper level oneself by teaching others, and this was a key concept in this approach. As an example, the Junior Coaches helped the students to define better interview questions. To achieve this, they needed to review the formulated questions of the students and suggest better alternatives. They needed to argue why the original questions could be improved, and give tips on how to do it better. In doing this, they improved their own argumentation skills and ability to communicate complex concepts.

By getting individual feedback from the lecturer following the silent observation sessions, and by seeing examples of coaching and workshop planning in action during the shadowing activities, they learnt a lot about responsibility and the learning processes of students. Furthermore, the coaches gained facilitation management experience by preparing the coaching sessions and the agenda:

> *Managing the time was difficult in the very first coaching sessions with the students, but after a couple of sessions, I learnt how to manage the time plan more efficiently, so that I could answer the questions of all the teams*.
>
> (Reported by Junior Coach)

The coaches believed that the experience they had gained would help them in their career in the future in conducting customer workshops in companies. The Junior Coaches received a certificate as a Junior Design Thinking Coach at the end of the semester.

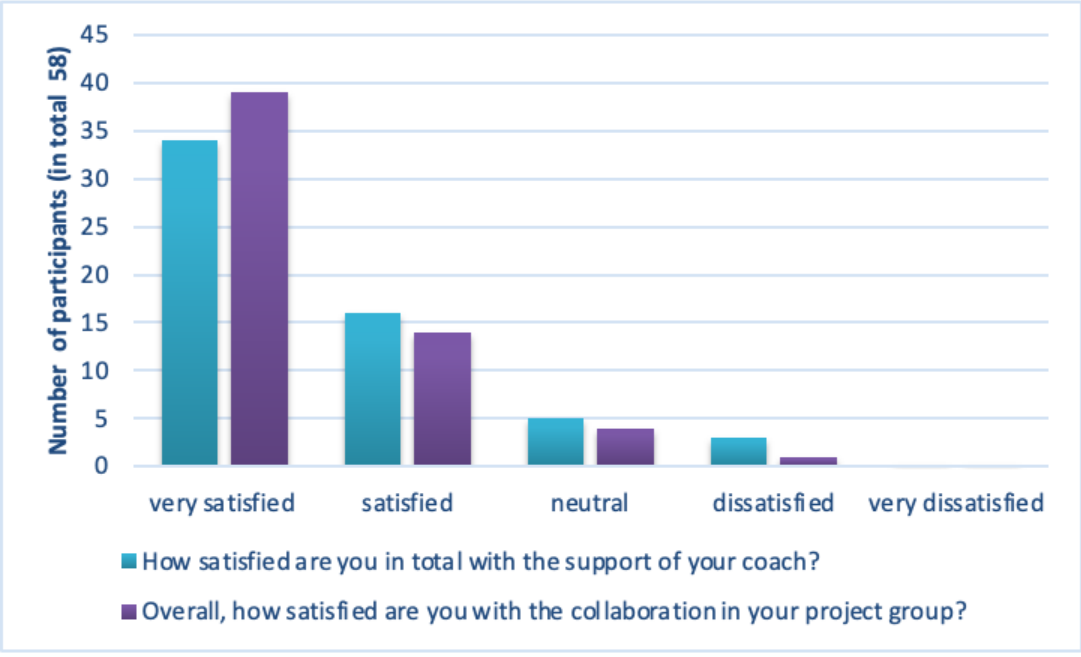

Figure 3: Survey results on satisfaction rating.

CONCLUSION

This extended tutor concept helps lecturers as well as Junior Coaches and students to teach, support and learn, respectively, methodical subjects such as Design Thinking. All three target groups welcomed the experiment and found it a positive experience. The choice of Mixed Method Research Design was appropriate in achieving the expected results. The findings of this study helped to improve the course concept in following semesters. For example, the Junior Coaches are now supporting students not only with the Design Thinking, but also with the App Development process.

To scale up this concept for more participants, we suggest increasing the number of coaches, but not the team sizes, or the number of people that each coach supports. According to the experience of Junior Coaches, supporting more than 23 course participants each, as happened in Case Study 1, could be challenging according to the limited available time for coaching. As suggested by Oakley, Felder, Brent & Elhajj (2004), the team size for effective teams should be 3-4 members. A higher number of coaches would mean that the weekly meetings of 1.5 to 2 hours would not be enough to review the activities of all the teams with the lecturer. One suggestion would be to add one further level to the hierarchy, so that one experienced Junior Coach would take the role of Junior Coach Lead and manage the regular meetings with all the Junior Coaches, and limit the weekly reflection sessions with the lecturer to 1.5 hours to clarify any unsolved problems. We will try out this concept, since we expect to have about 150 participants next semester.

One challenging aspect is the diverse level of knowledge of the Junior Coaches. This might lead to differences in the ability to support the teams. Providing well-structured coaching materials and templates could help to balance these differences. Therefore, we are currently expanding the materials available for use based on the feedback of our Junior Coaches.

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