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ENGineering and INdustry Innovative Training for Engineers (ENGINITE)

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IO2-T1: Setting the steps for the development of the PBL ENGINITE courses

Prepared by ThinkUP & AAU

Consortium

This document has been produced by the consortium of the ENGINITE project

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Task 1: Setting the steps for development of the PBL ENGINITE courses

As part of this task, Think Up was responsible to set up the steps that needed to be followed by the partners in order to develop the courses of the ENGINITE Training Programme and be in accordance with the PBL's principles.

In order to achieve this task the Think UP organized a period of reflective work that aimed to help participants identify what they already knew about problem-based learning and what their individual challenges were when trying to use problem-based learning.

This section provides
● An example of briefing participants on reflective work
● Use of an action learning group to experiment with learning new techniques
● The facilitators' reflections on the participants' reflective work.

Overview of the activity

Four weeks before the London-based. PBL training course was due to start, we set the participants the task of undertaking a period of weekly reflection on how they use problem-based learning in their teaching. The participants' first task was to form an **action learning group**, a group of peers that could help individuals identify personal challenges and help them reflect on how they overcame those challenges. In this case, the challenge we asked participants to set themselves was to identify what area of problem-based learning pedagogy do they find uncomfortable using and to commit themselves to integrating one new aspect of these uncomfortable areas in their weekly teaching. Each week the participants were to meet with their action learning group, reflect on their week's experiences, and to set themselves new challenges for the week ahead.

To accommodate some members of the cohort who weren't at that time engaged in any teaching, we extended the brief by asking those participants to consider possible ways of translating PBL principles into interventions that were applicable what problem-based learning principles they could apply in their workplace and to reflect on their experiences of doing so.

Participants briefing: reflective pre-work

The aim of this preparatory work is for you to experience problem-based learning for yourselves. The preparatory work we ask you to so is to experiment with implementing elements of problem-based learning in your current teaching and to reflect on the successes and challenges in action learning groups that you will form with your ENGINITE colleagues in your departments/companies. Thus, you learn about the practicalities of applying problem-based learning in your own habitual teaching setting, and you will also learn about dealing with the challenges you face using a problem-based learning philosophy. For us as training designers, this process will give us very good information about your training needs, so we can tailor the course exactly to what you need.

Note - for those of you who are not teachers or not currently teaching, we would still like you to participate in this reflective work. See the section below titled 'instructions for non-teaching staff'.

We are not asking you to apply a complete problem-based learning methodology, but equally, if you just carry on doing what you do already, then no progress will have been made. Neither you nor we will learn anything. We are also keen to point out that even if problem-based learning is already part of your teaching repertoire, there will always be room for new experiments.

Your brief for this preparatory work: to broaden your teaching methods using a problem-based learning manner, one step at a time.

You will do this by forming action learning groups with your ENGINITE colleagues in your institution/company. For a period of four weeks you will meet weekly to discuss what problem-based learning methods you are going to try and implement that week and what are your experiences as you do it. The aim of the action learning group is for group members to challenge each other to go beyond your normal teaching habits. Whether you choose classic problem-based learning or PBL-Aalborg style, or some combination of your own invention, is up to you. **Don't make it so complicated it feels like a burden. But please, don't either make it so small it becomes totally uninteresting.**

We suggest your first meeting should last two hours to give you enough time to set things up; subsequent meetings need only take an hour. Below are suggested agendas for your meetings and attached is a form you can use to support your group discussions and capture your learning.

What exactly you decide to do each week is up to you - **all we ask is that you commit energy and time to these activities**.

Agenda Week 1 meeting agenda (2 hours)
1. Form your group.
2. Fix weekly meeting times for the next three meetings.
3. Appoint a person from the group to be the point of contact with Oliver and Søren.
4. Discussion: "Do we understand the guidelines? - What might be interesting projects for the coming week?"
5. Each person fills in the action learning project description # 1 - 5.
6. Discuss briefly what feedback from the meeting contact person shall give Oliver and Søren.

Agenda Week 2, and subsequent meetings
1. Review, share and comment on experiences from the last week - and ideas for the coming week.
2. Fill in # 6 - 8 in action learning project description.
3. Update action learning project description - or make a completely new one.
4. Discuss briefly what feedback from the meeting contact person shall give Oliver and Søren.

Instructions for non-teaching staff

After we published our instructions for problem-based learning-oriented pre-training, Andri has made us aware that many among you are in fact not practically engaged in teaching. We still find it crucially important that our training work is done in ways that are consistent with the basic problem-based learning principles (learning by doing). Based on this conviction of ours, we've made an effort to translate our original instructions into a text aimed at the non-teaching ENGINITE staff:

Problem-based learning is about empowering the student. In traditional classroom teaching the teacher has the job of programming the student's learning acquisition process. In problem-based learning the programming initiative is partly handed over to the student. The teacher's main job becomes that of the facilitator. Instead of demanding, on a continuing basis, that the student follows the path decided by the teacher (Follow me), the teacher responds to the student's needs – for information, guidance or critical reflection – as these needs become manifest during the student's self-programmed learning efforts (Joint experimentation).

Now, shifts from an instructional or directive mode of behavior towards a more facilitative mode can be found in co-operational relationships outside the classroom. If your position is that of being leader or more experienced colleague, you can choose to delegate part of your authority to your employee or your less experienced colleague. Instead of telling 'the other' what to do, and how to do it, you may invite the other to make suggestions about what needs to be done, and you may give yourself the role of facilitator rather than agenda setter and decision-maker.

We stick to our request that all ENGINITE teams form action learning groups. Those who teach use our original instructions. The non-teachers search for instances in their habitual work routines where an instructional or expert-based mode of behavior might profitably be changed in a facilitative direction. Everybody uses the Action Learning Template as a means for specifying the 'learning experiment of the week'. And all teams give us feedback concerning their experiences, whether they be seen as successful or not. Based on this feedback we'll do our best to facilitate your further learning process.

Example action learning templates

Action learning template – ENGINITE pre-training 2018
1. Goal or purpose: What pedagogical results do I want to accomplish through my PBL project? – What makes it interesting or worthwhile – and for whom?
2. Social involvement: Who shall be directly engaged as my co-actors? – Will others have to be informed?
3. Actions required: What must I do – and do differently from what I normally do? – When, where and how shall I do it?
4. Collecting evidence: How may I know if my goal has been accomplished, my pedagogical intentions fulfilled? (e.g. through observations then and there – or asking questions then and there or later – what are the success criteria?)
5. Personal-professional challenges: Do I see the project as fairly easy – fairly difficult? – In what way(s)? – What do I see as the learning to be gained from the project?
6. Evidence collected (post hoc): Give details about data and its import.
7. Unintended learning effects: Did the project make me wiser in unexpected ways?
8. Adjustment of plans: Did local circumstances make you act contrary to your original intentions? – If yes, how and why?