

PROBLEM-BASED INTER- / TRANS-DISCIPLINARY MASTER'S PROGRAMS:

THE CASE OF TECHNO-ANTHROPOLOGY

TOM BØRSEN, DIRECTOR,
STUDYBOARD FOR TECHNO-ANTHROPOLOGY, SUSTAINABLE
DESIGN AND INTEGRATED FOOD-STUDIES
LONE STUB PETERSEN,
ASSOCIATE PROFESSOR, TAPAR, DEPT. OF PLANNING.

Experience with Master's programs at AAU

2008 to 2011: Learning and Innovational Change

2011 to ?: Techno-Anthropology

2017 to ?: Sustainable Design and Integrated Food Studies



AALBORG UNIVERSITY
DENMARK

PBL SUPPORTS INTER- AND TRANSDISCIPLINARY STUDIES

Table 9.1 Models of problem-based learning

	<i>Model I PBL for Epistemological Competence</i>	<i>Model II PBL for Professional Action</i>
Knowledge	Propositional	Practical and performative
Learning	The use and management of a propositional body of knowledge to solve or manage a problem	The outcome-focused acquisition of knowledge and skills for the work place
Problem scenario	Limited – solutions already known and are designed to promote cognitive understanding	Focused on a real-life situation that requires an effective practical resolution
Students	Receivers of knowledge who acquire and understand propositional knowledge through problem-solving	Pragmatists inducted into professional cultures who can undertake practical action
Facilitator	A guide to obtaining the solution and to understanding the correct propositional knowledge	A demonstrator of skills and a guide to 'best practice'
Assessment	The testing of a body of knowledge to ensure students have developed epistemological competence	The testing of skills and competencies for the work place supported by a body of knowledge

	<i>Model III PBL for Interdisciplinary Understanding</i>	<i>Model IV PBL for Transdisciplinary Learning</i>	<i>Model V PBL for Critical Contestability</i>
Knowledge	Propositional, performative and practical	The examining and testing out of given knowledge and frameworks	Contingent, contextual and constructed
Learning	The synthesis of knowledge with skills across discipline boundaries	Critical thought and decentering oneself from disciplines in order to understand them	A flexible entity that involves interrogation of frameworks
Problem scenario	Acquiring knowledge to be able to do, therefore centred around knowledge with action	Characterized by resolving and managing dilemmas	Multidimensional, offering students options for alternative ways of knowing and being
Students	Integrators across boundaries	Independent thinkers who take up a critical stance towards learning	Explorers of underlying structures and belief systems
Facilitator	A coordinator of knowledge and skill acquisition across boundaries of both	An orchestrator of opportunities for learning (in its widest sense)	A commentator, a challenger and decoder of cultures, disciplines and traditions
Assessment	The examination of skills and knowledge in a context that may have been learned out of context	The opportunity to demonstrate an integrated understanding of skills and personal and propositional knowledge across disciplines	Open-ended and flexible

"PBL [can] help students integrate learning across subjects and disciplines" (Savin-Baden 2000)

FRAMEWORKS FROM PHIL. OF SCIENCE AND SCIENCE AND TECHNOLOGY STUDIES

Concept	Author(s)
Paradigm	Kuhn, Gube&Lincoln
Denk styles / collectives	Fleck
Disciplinary cultures	Schön
Epistemic cultures	Knorr Certina
Programmes / anit-programmes	Latour
Communities of practice	Wenger
Epistemé	Foucault

Concept	Author(s)
Trading zones	Gallison
Interactional expertise	Collins&Evans
Boundary objects	Star
Hybrid imagination	Jamison&Botin
Discourse ethics	Habermas
Extended peer-community	Ravetz

WHO DID WE ENROLL IN 2014?

2.1 Admission

Admission to the Master's programme in Techno-Anthropology requires a Bachelor's degree in Techno-Anthropology or another relevant Bachelor's degree. A relevant Bachelor's degree is defined as a Bachelor's degree which contains a least 10 ECTS philosophy of science, research ethics or research design and that generates core competences within at least one of the following main areas:

- Qualitative methods for collection of empirical material
- Technology understanding, e.g. technology development or -operation.

Students with another Bachelor's degree, upon application to the Board of Studies, will be admitted after a specific academic assessment if the applicant is deemed to have comparable educational prerequisites. The University can stipulate requirements concerning conducting additional exams prior to the start of study.

WHO DID WE ENROLL IN 2016?

2.1 Admission

Applicants with a legal claim to admission (retskrav):

Applicants with the following degrees are entitled to admission:

- Bachelor of Science (BSc) in Techno-Anthropology, Aalborg University

Applicants without legal claim to admission:

Applicants with one of the following degrees meet the admission requirements:

- Professional Bachelor's degree in Health or Technical Science
- Bachelor's degree in Science, Technical Science, Humanist Technology, Art and Technology, or Communication and Digital Media
- A bachelor's degree in Anthropology, Market and Management Anthropology, Sociology or Psychology gives admission to the Master's program in Techno-Anthropology if it has addressed technology in a socio-technical perspective as a central element. This requirement must be documented in a letter of motivation enclosed the application of enrolment, and possibly discussed at an interview.

Students with another Bachelor degree may, upon application to the Board of Studies, be admitted following a specific academic assessment if the applicant is considered as having comparable educational prerequisites. The University can stipulate requirements concerning conducting additional exams prior to the start of study.

PROBLEM: INTEGRATION OF AND HOMOGENIZE STUDENTS WITH DIFFERENT BACKGROUNDS AT TECHNO-ANTHROPOLOGY

SOME NON-TECHANT PROFESSIONAL BACHELORS END THEIR ENROLLMENT, OR DO NOT PASS EXAMS. OTHERS DO VERY WELL.

(OUR ANECDOTAL IMPRESSIONS: THEY DO NOT USE THEIR BSC COMPETENCIES VERY MUCH – DIFFICULT TO ADOPT ACADEMIC SOCIAL-TECHNICAL CRITICAL REFLECTIONS)

2014: "IT MIGHT BE A BIT BORING FOR THE BACHELORS FROM TECHNO-ANTHROPOLOGY SOMETIMES, BEACUSE SOME OF THE EXAMPLES ARE KNOWN." (MIDTERM EVALUATION, OCT 7, 2014)

2016: "DIFFICULT FOR FORMER TECHANT BACHELORS: LECTURING COVERING THE SAME MATERIAL THEY HAVE PREVIOUS STUDIED. NOT VERY USEFUL". (STEERING GROUP MEETING, SEPT. 21, 2016).

PURPOSE

CONTRIBUTE TO THE DEVELOPMENT OF
ROBUST AND SOCIALLY RESPONSIBLE
TECHNOLOGICAL SOLUTIONS TO SOCIETAL
CHALLENGES

Socially acceptable
technologies.

Intentions versus
actual effects



PROBLEMS – CHALLENGES

CONTRADICTIONS BETWEEN...

- DIFFERENT PROFESSIONS AND EXPERT GROUPS WORKING WITH TECHNOLOGY (E.G. AT HOSPITALS)
- CONSUMERS / USERS OF TECHNOLOGY AND THE TECHNICAL EXPERTS (E.G. IT-PROJECT, GM FOOD)
- INTENTIONS AND ACTUAL SOCIETAL, CULTURAL AND BIOLOGICAL CONSEQUENCES OF NEW TECHNOLOGIES (E.G. ENHANCED NORMALITY)

TAN COMPETENCES

- ACT AS PARTICIPANTS, MEDIATORS AND FACILITATORS IN INTERDISCIPLINARY INNOVATION AND PROJECT TEAMS.
- CONTRIBUTE TO THE DEVELOPMENT OF ROBUST AND SOCIALLY RESPONSIBLE TECHNOLOGICAL SOLUTIONS TO SOCIETAL CHALLENGES.
- SUPPORT THE TRANSFORMATION OF TECHNOLOGICAL OPPORTUNITIES INTO SOCIALLY RESPONSIBLE PRODUCTS AND SYSTEMS.

TAN7 IN 2014 AND IN 2016

2014

2016

Semester	Module	ECTS	Semester	Module	ECTS	
1st	Expert Cultures and Responsible Technology (project)	15	1st	Interdisciplinary Knowledge Production: Analysis and Dissemination of BSc Knowledge Production and Technology in Practice (pilot project)	5	
	Organisational Culture: Expertise, Innovation and Responsibility	5		Technology in Practice (project)	10	
	Responsible and Innovative Knowledge Production	5		Techno-Anthropological Problems and Theories	10	
	Elective	5		1A	Ethnographic Methods	5
				1B	Ecological Economics*	5
		1C	Emerging and Cutting Edge Science and Technology**	5		

We thought that the new curricular would solve the problems. This did not quite happen

EFFECTS OF THE CURRICULUM CHANGE

- MIXED PROJECT GROUPS (FORCED)
- IMPROVED SOCIAL ENVIRONMENT
- CLEARER TAN PROFILE

- ALL GOOD, BUT...

- STILL LACK OF INTEGRATION OF DIFFERENT DISCIPLINARY BACKGROUNDS IN THE PROJECTS

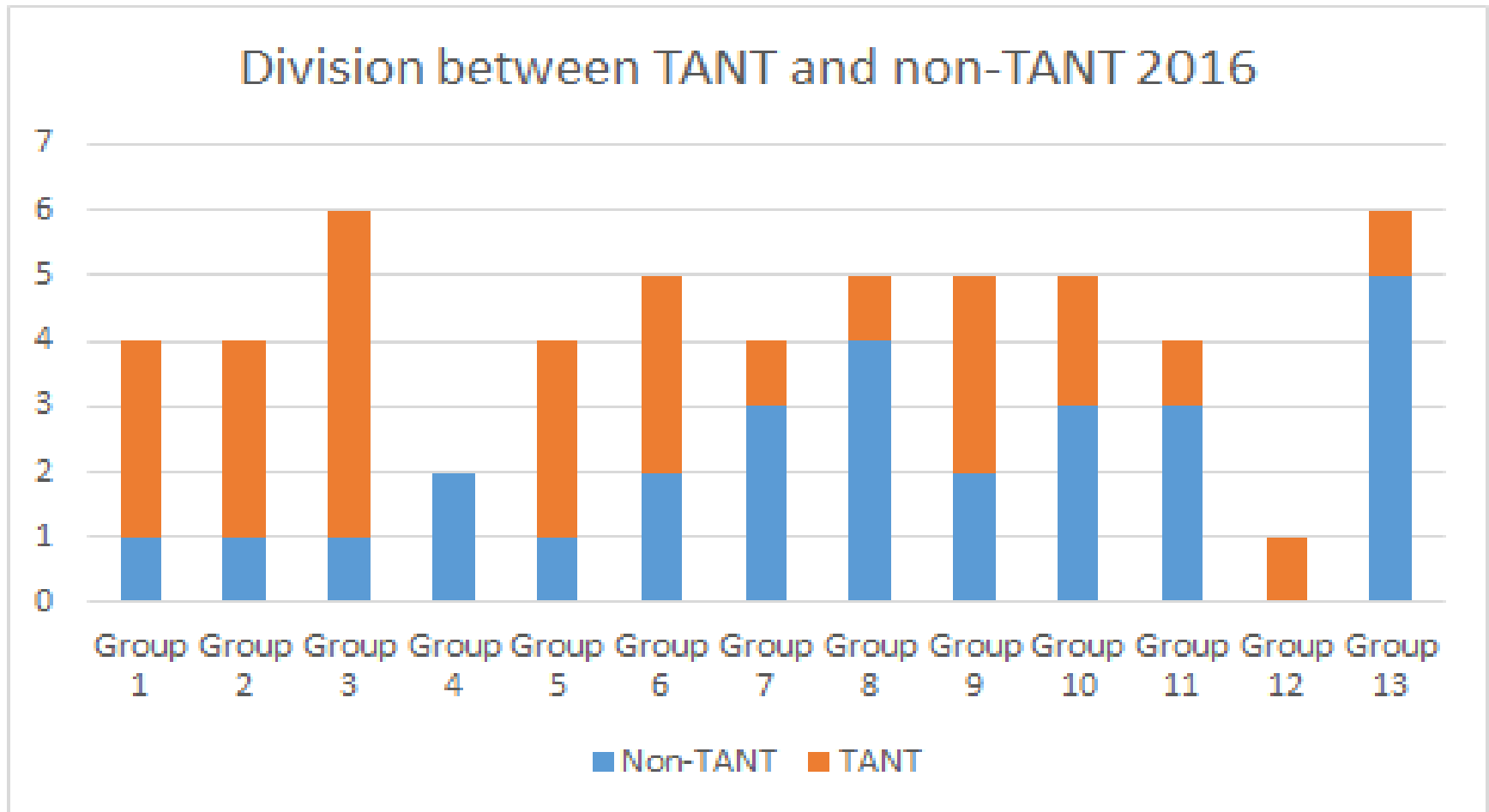
- TAN-BACHELORS PERCIEVE REPITITION AND PROFESSIONAL BACHELORS FIND THE PROGRAM CHALLENGING

- THIS PBL DEVELOPMENT PROJECT AIMS AT SOLVING THESE ISSUES

PROJECT ACTIVITIES

1. ANALYSES OF PROJECT REPORTS
2. WORKSHOP WITH STUDENTS TO GENERATE IDEAS TO ADDRESS THE CHALLENGES
3. WORKSHOP WITH TEACHERS TO GENERATE IDEAS TO ADDRESS THE CHALLENGES
4. SELECT AND TEST SOME OF THE IDEAS IN THE FALL SEMESTER
5. WORKSHOPS WITH STUDENTS AND TEACHERS THAT EVALUATES AND SUGGESTS IMPROVEMENTS REGARDING THE TESTED IDEAS

PROJECT REPORT ANALYSIS: GROUP COMPOSITIONS (TAN1)



PROBLEM FORMULATIONS

THE PROBLEM STATEMENTS OF THE 2016 PAPERS ARE GENERALLY VERY LONG AND CONSISTS OF MULTIPLE AREAS OF RESEARCH.

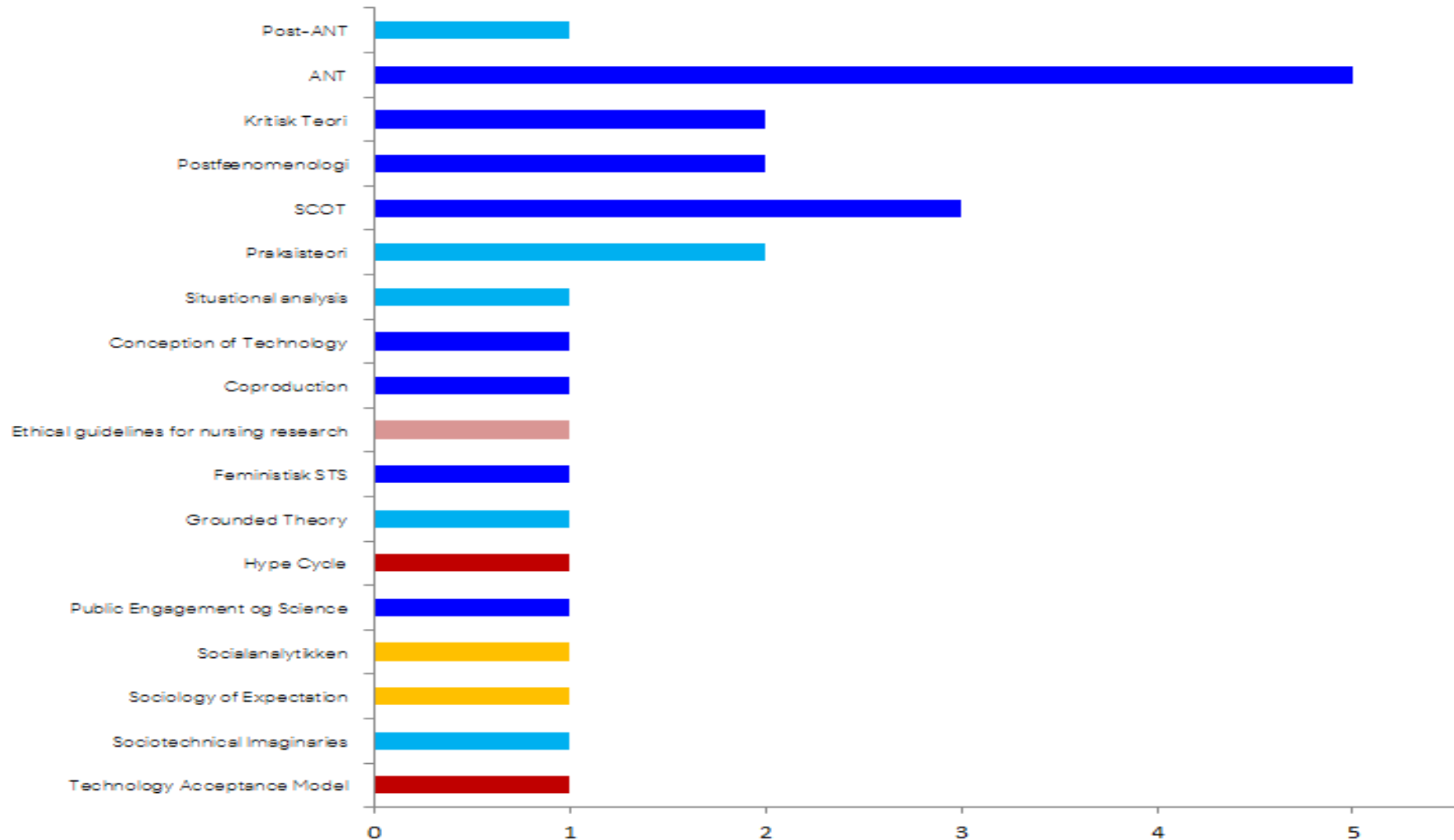
"HOW CAN THE APPROACH UTILIZED IN LEO INNOVATION LAB CONTRIBUTE TO BETTER TREATMENT AND ELEVATED QUALITY OF LIFE FOR PEOPLE WITH PSORIASIS? WHICH MARKET TENDENCIES HAVE PUSHED LEO PHARMA INTO TO THIS NOVEL STRATEGY, WHAT DO THEY GAIN FROM IT, AND WHAT ARE THE POTENTIAL PITFALLS IN THIS APPROACH?"

WE PREFER

- INCLUSION OF INITIAL PROBLEM
- LONG PROBLEM ANALYSIS (SEVERAL PAGES)
- ONE SHORT PROBLEM STATEMENTS
- A CLEAR DISTINCTION TO SUB RESEARCH QUESTIONS
- CLEAR SOCIO-TECHNICAL FOCUS IN THE PROBLEM STATEMENT AND THE RESEARCH QUESTIONS
- EXPLANATION OF RELATIONSHIP BETWEEN PROBLEM STATEMENT AND RESEARCH QUESTIONS

METHODS: INTERVIEWS, LITERATURE SEARCH AND OBSERVATIONS

Brugte teorier 2016



NON-TAN STUDENT'S INFLUENCE ON THE PROJECTS

THE REPORT ADDRESSES A PROBLEM RELEVANT FOR THE PROFESSION (6 GROUPS)

CHAPTER CONTENT ARE SUMMERIES OF CONTENT OF NON-TAN BACHELOR PROGRAMS (4 GROUPS)

THE TAN THEORIES AND METHODS SEEMS PREDOMINANT IN THE REPORTS

WORKSHOP DESIGN FOR TEACHERS AND STUDENTS

Workshop 1: Evaluation and idea development

- a) Evaluation: What do teachers / students do now in their course and in group supervision? What does and does not work?
- b) Idea development: What can be done in order to support interdisciplinary competences?

(Development of semester coordination game)

Workshop 2: Implementation

- a) Introduction to the semester coordination game.
- b) Play the semester coordination game and consider what steps should be taken in the various course modules and supervision.
- c) Suggestion for a teaching plan.
- d) Criticism of the game – missing elements and development opportunities

Workshop 3: Evaluation

- a) What works / does not work in the implemented actions.
- b) Creative Thinking Exercise - Rethinking teaching and supervision (bold conjectures / ideas)
- c) Creation of new idea cards for semester coordination game.

IDEA FOR FIRST WORKSHOP WITH STUDENTS

EVALUATION – HOW DO WE SUPPORT INTERDISCIPLINARITY?

- OPEN SESSION - WHAT DOES AND DOESNT WORK?
- REFLECTION AND DISCUSSION IN GROUPS – WHAT ARE THE CHALLENGES? (THEMES: INITIATING PROJECT, COURSES, PROJECT, SUPERVISION AND SOCIAL ENVIRONMENT.)
- CHOSE MOST URGENT CHALLENGES (EACH STUDENT GETS 5 MARKERS)

IDEA DEVELOPMENT – HOW DO WE EXPLOIT AND SUPPORT (OR SUPRESS) INTERDISCIPLINARITY IN THE FUTURE TO CREATE AN IMPROVED THE STUDY ENVIRONMENT?

- OPEN SESSION – WHAT IDEAS DO YOU HAVE FOR IMPROVEMENTS?
- REFLECTION AND DISCUSSION IN GROUPS – WHAT CAN BE DONE? (THEMES: INITIATING PROJECT, COURSES, PROJECT, SUPERVISION AND SOCIAL ENVIRONMENT)
- RANK THE INITIATIVES (MOST IMPORTANT – LESS IMPORTANT)

IDEAS TO BETTER INTEGRATE NON-TAN AND TAN BACHELORS TO BE TESTED IN E17

1. EMPLOY A NEW METHOD THAT NO ENROLLED STUDENT REALLY MASTERS – E.G. LITERATURE SEARCH AND REVIEW
2. ASK THE STUDENTS TO DEFINE THEIR OWN CURRICULUM TO DIFFER BETWEEN TAN/NON-TAN (IN BOTH COURSE AND PROJECT)
3. PBL-PIXI – MAKE EXPLICIT WHAT KIND OF PBL MODEL WE ARE USING – PROGRESSION IN PBL-MODELS OVER DIFFERENT SEMESTERS
4. DEFINE A CLEARER INTERDISCIPLINARY SCRIPT FOR THE PROJECT – E.G. DESCRIPTION OF BOTH MAINSTREAM TECHNICAL AND SOCIO-TECHNICAL RATIONALITIES
5. TAN STUDENTS COMMUNICATE TAN RATIONALITY TO NON-TAN STUDENTS AND VICE VERSA (TECH DOMAIN RATIONALS)
6. PRESENT IN THE REPORT HOW THE STUDENTS' DIFFERENT COMPETENCIES ARE USED