Application for ETP – Øyvind Fiksen, Dept of Biology, UiB.

I start by sharing some thoughts on what students should learn from studies at the University, and then sketch my personal development as a teacher before presenting three case studies. In the first case, I reflect upon educational leadership based on my recent three-year experience as Head of Education (HoE) at BIO. The second case study describes experiments and reflections in the course BIO201, while the third case focus on my contributions to PhD training and supervision. The three cases are very different. The first is the most important for my personal development, particularly since it involved establishing and starting the Centre of Excellence in Biology Education, bioCEED. This activity forced me into reading research literature on teaching and learning, changed my perspectives, and led to a more explorative approach to my own teaching practice, as described in the second case. A large fraction of my teaching relates to supervision of students at the PhD level. I have devoted much effort into developing summer schools and arenas for young scientists to meet with top-researchers within their field. The cases illustrate my vision of a University education that is transformational, relevant and an active learning experience for students – from they enter the Bachelor to they complete their PhD.

MY PERSPECTIVES ON EDUCATION AT THE UNIVERSITY

University education should be transformational. Studying at a University is, in my opinion, different from other schools in how much weight is placed on critical and autonomous thinking skills in students. Students should learn to think like a scientist, learn to evaluate the validity of alternative explanations, and obtain threshold concepts and knowledge that provide them with new perspectives and tools to understand a subject or discipline.

University education must be relevant. Students must also develop skills and competencies needed for modern working life and prepare the transition from higher education to careers outside academia. Many of our students will not pursue further academic studies after their bachelor degree, and our challenge and responsibility is to ensure that a bachelor degree from our faculty is sufficient qualification for the job market. This point has been emphasized and elaborated in great detail in the NSF/AAAS Report '*Vision and change in undergraduate biology education*' (AAAS 2011), which has influenced my thinking on these issues substantially. It points out that probably the most important competency students can achieve during undergraduate (biology) studies is the ability to use the scientific process, and learning how science functions in service of society. This competency is connected to the fostering of critical thinking skills, but also involves training in a range of practical tools, skills and abilities that are needed to apply the scientific methods to answer questions and solve problems. A central point in *Vision and change* is that undergraduate degrees in biology should contain a broad disciplinary mix to prepare students for multidisciplinary tasks in future corporate environments or scientific activities and projects.

Learning at Universities must be active. Developing the capability of applying science requires a student-centred approach to teaching and learning, where the brains and minds of students are challenged and stimulated. In general, higher education practices need to reduce the number of traditional lectures (Raaheim, Fiksen & Jeno 2016) and to encourage more active learning activities in class and between classes (Schmidt *et al.* 2010; Freeman *et al.* 2014; Wieman 2014a). Knowledge is not poured into our heads; it is constructed in our brains and neurons (Brown 2014). I am an advocate for a research-based educational practice, and pedagogical research is giving a clear picture – traditional lecturing is an inefficient learning activity. It is less engaging than the alternatives as well.

Teachers should think in terms of constructive alignment. This is a concept from Biggs (Biggs & Tang 2011) that has become important to me and many others at BIO the last few years. It

points out what is rather obvious in hindsight; the structure of our course designs determines what the student does, and teachers can use this to draw students into the learning activities that are most productive and efficient to obtain intended learning outcomes. In case two below, I demonstrate how I have developed a course design over time in line with this idea.

HOW MY TEACHING PRACTICE HAS EVOLVED AND MATURED

I started teaching in 2002, with no pedagogical training or education at all. I can still remember my own focus on the lecture, and my performance during lectures. In retrospect, it is easy to see that I was a Level 2 teacher in Biggs terminology (p. 18, Biggs & Tang 2011), the focus was entirely on my own performance, not on student learning.

Today I see the importance of bringing my researcher attitude and curiosity into my own teaching practice (Fiksen 2015). This need not be in the form of publications in educational journals, although that should be an important goal, but documenting results and experiences in the form of notes and reflections, a self- or action study that can be shared and discussed with colleagues. A crucial step is not to be afraid of experimenting, developing new learning activities, assessment methods, or technology in teaching. I know that this is a major hurdle to many university teachers, myself included, but it is essential that we take this step and expose ourselves to the risk of making mistakes. I have become more of a 'reflective practitioner' (p. 45 Biggs & Tang 2011), as exemplified in my course reports (e. g. in BIO201 and BIO301). I have continuously revised the course design thinking as a scientist; using literature, own observations and reflections. For instance, in the portfolio assessment in Case 2 below, where students wrote assignments and made extensive use of scientific literature, the relevance of reading a textbook or attending lectures was lost. The course was not *aligned* (Biggs & Tang 2011), as the learning outcomes and activities I had included was not adequately embedded in the assessment procedure. The students did not do what I expected them to do - but instead what was optimal in order to obtain high scores on assignments.

The change in my perspectives came during my HoE-period, and was triggered from reading textbooks on education, the research literature and by meeting with a number of people with knowledge in pedagogics and the scholarship of teaching and learning (SoTL). In retrospect, I find it strange that I, like so many others, did not read more or consult the scientific literature on teaching and learning given that I spend so much time on it. I believe the key to change attitudes and practices in higher education is getting teachers (I do not call the m lecturers any more) to read a book and some good papers on teaching and learning. Why is it still accepted to be so ignorant in this field, even at Universities, and even among leaders of these institutions?

CASE 1: EDUCATIONAL LEADERSHIP - MAKING WHEELS TURN AT THE MESOLEVEL

My recent 3-year appointment as Head of Education (HoE) at Department of Biology (BIO), included the role as PI for work package 1 and Board member in bioCEED - Centre of Excellence in Biology Education. This period certainly was transformational for me. In this role, I had to develop my own positions on teaching practices and learning, the current state of educational quality at BIO and UiB, and many other issues, for instance what leadership may contribute to make institutions and the whole sector move in the right direction. I have internalized some 'threshold concepts', partly from the literature and partly from my active participation in the collegium, and see the educational landscape at all scales from student learning to institutional policies through new lenses.

Selected collegial educational development project as HoE at BIO:

a) *Increasing the relevance of our educational programmes*. Before I became HoE I was part of the group revising the bachelor degree in Biology at UiB. The *Vision and change* report did not exist at the time, but we ended up with a similar structure, emphasizing the

multidisciplinary, quantitative and integrative aspects of biology education. We added physics and statistics as mandatory elements in the BSc degree and introduced one common textbook for all basic biology courses, an important change for employability of BSc candidates and alignment at the programme level, respectively. The importance of a broad background and basis in the sciences, close contacts with stakeholders and industry, and the development of transferable skills in graduate marine programmes in Europe is also pointed out in an upcoming report from the Working group on Marine Graduate Training (European Marine Board) where I have been a member (Vincx *et al.* in press).

b) *The establishments of the Centre of Excellence in Biology Education, bioCEED*. The implementation of bioCEED involved a steep learning curve for everyone involved, both through the application process and for me as leader of WP1 *Collegial teacher culture*. The annual reports of bioCEED (see 2014 and 2015) summarize and document activities in this Centre. My role has involved dissemination of experiences and representation of the center locally and nationally, and I have contributed about 30 invited talks nationwide related to education (listed in the annual reports and my teaching portfolio), newspaper articles and radio interviews (see CV).

c) *Building a stronger collegial culture among teachers*. As HoE and leader of the Programme Board, it was natural for me to take the leadership in bioCEED WP1 – and try to develop a more collegial teacher culture. As in many other University departments, we are often acting as single individuals rather than as a collegium of teachers in developing courses and programmes. We needed a strategy to stimulate discussions and sharing of experiences of our teaching practices, facilitate good examples and bold ideas and simply to learn more about teaching and learning. Elements that really had positive impact on our internal collegial culture arrived with bioCEED, and one efficient element have been the annual teachers retreats. The first teacher's retreat I organized was in Lyngheisenteret, a rural place and limited accommodation facilities, even faculties had to share rooms. It was the first time BIO arranged a retreat directed towards teaching, and my impression is that it triggered much discussion around lunch- and coffetables, in significant networks (Roxa & Martensson 2009). Such retreats are common in research communities, and can be seen as a transfer of that culture to our teaching collegium (Fiksen 2015). Clearly, teaching is the main activity all faculties at the department has in common, so it is more suited as theme for collegial retreats than any single research topic. We have had three retreats so far, and although the particular impact of them are difficult to measure, their immediate and certain effect is that teachers spend one full working day and one evening learning about and discussing teaching with their significant colleagues. This is unprecedented in the history of our department, and probably in most research-intensive University units.

d) *Quality assurance*. As HoE I emphasized the Quality assurance report with an ambition of making it an effective tool in quality development at the level of individual courses and teachers. SoTL involves a more experimental approach to teaching, combined with documenting and sharing of experiences with colleagues, critically reviewing the outcome and constantly revising and performing new experiments. This intention is at the core of UiB's procedure for Quality Assurance of courses. As a minimum, this should contain student evaluations and a reflection by the teacher on the course and improvements for next time. When I was HoE, all the large, mandatory basic courses presented their written report for the Programme Board every year, as an opportunity to discuss challenges and ideas for next year, and to receive feedback on this from students and colleagues. It is an element in SoTL, and one way to encourage transformative reflection (p. 45 in Biggs and Tang, 2011). The reports represent the standard quality assurance procedure at UiB, and they are available online in the Quality database. The development of these texts become much more

meaningful and of higher quality when there is a clear recipient to them, such as the HoE and the Programme Board. A clear expectation that these must be produced and presented helps teachers to prioritize this reflection in a busy academic environment. Moreover, as I illustrate in Case 2 – these reports are important in documenting and sharing my own effort and thinking in teaching. They are useful to colleagues curious to see the outcome of a particular learning activity in their own evaluation of trying it out themselves, for instance.

Improved student learning – a role for mesolevel leadership?

Learning outcomes are more likely to be achieved in some settings than in others (Deslauriers, Schelew & Wieman 2011; Freeman *et al.* 2014). The ambitions of both bioCEED and my HoE effort were ultimately to change learning activities, assessment methods and relevance at all meeting places between teachers and students. The crucial step and the largest hurdle (as it was for me personally) to move in this direction was to develop the awareness of SoTL and to build a collegial culture among teachers that stimulates an experimentalist attitude to own practice. Educational research and scholarship has the same success criteria as all other science, repeatability and predictability (Wieman 2014b). An awareness of and positive attitude to become reflective practitioners can be triggered in most faculty members at the University, but it need a kick start and support along the way. This is where academic leadership has a parallel role as teachers to the students: give teachers a reason and a rationale to change, and then provide the opportunities and tools to transform. In essence, the teacher's attitudes are the key to develop active learning and competency development along the lines suggested in e. g. Biggs & Tang (2011) and Vision and change (2011). Learning from the researcher culture has become a key selling point of bioCEED, as this argument appeals to teachers that are active researchers. It seems to me, by chance or by intuition, the direction BIO is moving is in line with recommendations in Martensson, Roxa and Olsson (2011) and Gibbs (2013) ('Gibbs list').

Local leadership is recognized to play an important role in facilitating change at the educational meso-level (Gibbs 2013; Martensson & Roxa 2016), also by leaders in NOKUT (Mørland 2015) but little research exist on what quality in educational leadership is or how it is generated (Bryman 2007). As an agent in this field, I believe the presence of active and supportive local leadership can make a difference to the status and effort in improving educational practices where they occur. A stronger collegium can better find common ground to develop the curriculum and learning activities towards a common goal, and one that includes more active-learning and building of 21st century skills and competencies.

CASE 2. BIO201 ECOLOGY AS AN EXPERIMENTAL COURSE TRANSFORMATION

In the following, I will describe my current teaching strategy in the course I have been teaching for many years, BIO201 Ecology. The last few years I have been experimenting extensively with learning activities and assessment in this course. While the subject matter has remained the same, I have varied learning and assessment formats between years, and used BIO201 as my personal learning lab.

A scholarly approach to course transformation. As pointed out above, we could benefit from implementing active use of several elements inherent in our research culture also when teaching. I find two written documents per year per course very useful instruments. First, a detailed design and outline for each course, with details about curriculum, learning outcomes, content, learning activities, assessment (and criteria), workload estimates for each element, a detailed time schedule including contact meetings and deadlines, and motivational comments or meta-perspectives on learning. This is available to students as soon as they sign up for the course. Second, and after the course is completed, I write a quality assurance report including

the course outline, experiences, statistics and an interpretation of student evaluations and reflections on changes or new experiments for next year's course. I also revise the learning outcomes during this process. The course reports are publically available in UiB websites and documentation for more thorough publications summarizing the lessons learned for a wider audience.

Evolution of an ecology course. I was first involved in BIO201 in 2008, and the year after I got some influence on the learning activities. The course was then a mandatory part of the bachelor degree in biology, and between 60 and 100 students followed the course. I added three written assignments, worth 25% of the final grade, as a learning activity. Otherwise, this was a standard lectures & written exam course format. As we revised our bachelor programme in 2011, the course was mandatory to only students aiming for a master in ecology and evolution. Also, I went on a sabbatical, and became HoE as I returned, with less time for teaching. As discussed earlier, the time since 2012 has been a steep learning curve. When I returned to teaching in 2015, I was determined to use BIO201 as a lab for teaching experiments, to transform it to an active learning experience and to apply methods and approaches I promoted during my involvement in bioCEED. Inspiration from Carl Wieman's papers and his Science Education Initiative (CWSEI) was particularly important, along with my reading of the 'yellow book' by Biggs & Tang (2011), of course.

In 2015, I redesigned the course to portfolio assessment, with no exams, only written assignments and two individual projects involving simple simulation exercises. There is a variety of portfolio assessment models in Norwegian higher education; it has been called a 'chameleon system' with a range of formats deviating from the traditional 'collection-reflection-selection' model (Dysthe & Engelsen 2011). Our portfolio model was clearly a hybrid where students could write six assignments and the best four would be included in the assessment, the presentation portfolio. The intention was that as students wrote and received formative feedback they would improve and, consequently, complete all assignments. However, as we also scored each assignment it typically became mathematically unlikely to improve the grades after four assignments, and students of course did this math much better than we did. Backwash (Biggs 2012), but not as an intended outcome from our course design. Another important issue from the course design in 2015 was the summative focus of the assignments. Since each score were included in the final portfolio, all writing became high-stakes. The feedback provided from the teachers was summative rather than formative, and seemed not to be very useful for the following assignment on a very different topic. Few students made clear advances in their scores during the course. In addition - we did not think of making students work in teams. The learning activities included much traditional lecturing that was to some degree decoupled from the assignments – poor alignment. Finally, although the themes of assignments were covered in the textbook, reading the book lost much of its relevance. This was not our intention, and given the ILOs at the time, reading the book was essential.

We (a group of four teachers involved in the course) realized these weaknesses in our design and developed a rather critical quality assurance report. Here, we also pointed out some positive experiences, such as the many good written assignments we received, and in particular, the theoretical lab exercises. The one student providing written feedback in the evaluation said '*This is the best course I have taken during my three years at university'*. Still, we reformulated ILOs and completely redesigned the course again for 2016.

In 2016, the ILOs emphasized transferable skills and critical thinking at the expense of declarative knowledge. We introduced ILOs like '*write good and independent texts*'; '*consider relevant, contemporary and applied ecological issues in light of ecological research*'; '*use some statistical and numerical methods actively*'; '*create informative and precise illustrations and graphs*'. This was an ambitious change, where we intended to focus more on generic skills and important questions than on the finer details of ecology (Hoskinson, Barger & Martin 2014). We placed a large emphasis on writing as a learning activity, and introduced 11 items in the portfolio, all part of the assessment: one oral presentation, one essay or review on a chosen theme, five given assignments related to the textbook, three group projects on quantitative analysis, and one reflective piece on all portfolio items. Based on experiences from 2015 we set up a plan where students could upload draft versions of all written assignments to the learning platform, which teachers commented on (but made no assessment of). We also offered sign-ups for individual meetings for feedback in person at several occasions. The aim of this was to create a realistic and meaningful, or situated, framework for developing academic texts in a feedback loop where students also had to act on the feedback they received. We added group projects, and managed them in accordance with recommendations from Team-Based Learning literature (Michaelsen & Sweet 2008). We had fewer traditional lectures, but this was still an important situation in the course.

What was our main lessons from this experiment? Interestingly, a PhD-student in pedagogy from University of Oslo found the design interesting and included the course as a case in her project. She followed the course closely and interviewed students about their experience. Her results are not available yet, but we summarized our reflections in the 2016 Quality assurance report. Perhaps the most important lesson for us was that we had moved the ILOs and the course to a higher level in the SOLO taxonomy (Biggs 2012), but not really intentionally. It was an outcome of shifting away from declarative knowledge, and adding numerous higher order ILOs. BIO201 is an undergraduate course with few mandatory requirements to be enrolled, and the students typically have little training in ecology. They need to learn the basic concepts and to read a textbook, which is what we tried to make them to do, but without the appropriate assessment method. Our course was still not properly aligned. We discovered many positive effects of letting students work in groups, and from introducing them to scientific search engines and journals. One element that worked particularly well was the peer-review assignment. It was instructional for us teachers to see how students commented texts. They were very constructive and positive, and quite detailed. Although feedback is frequently quoted as the most important element in effective learning, I have become aware that both students and teachers must be prepared for it, realizing the receiver-provider perspectives. It is a quite personal thing to do, and here is an area where we have to reduce our researcher attitude and habits. We need to think carefully through how comments are received in the other end. There is a lot to learn about timing, form and effectiveness of feedback, it is powerful when used correctly (Shute 2008), but if not, its impact can also be negative (Hattie & Timperley 2007). The individual feedback sessions, where students could sign up for individual meetings and supervision on all portfolio items, were useful to complement all the written communication. I noticed how my written comments were sometimes not clear or miss-interpreted. Students did not sign up as much as I had hoped, even if I held the meetings in the cantina, but the direct discussions with students made me more aware of the art of commenting written assignments.

In 2017, we therefore revised the ILOs once again. We also thought more carefully through the selection of words in the ILOs, trying to follow Biggs SOLO taxonomy. The first ILO now is '*describe and explain basic ecological theories, concepts and models'*, an ILO which we expect will make the textbook and class meetings relevant again.

Figure 1. Students working on their individual answers of online quizzes in BIO201 January 2017. Next, they will discuss in groups to find collective answers to the IF@AT forms. The groups were generated randomly, and remain fixed in class and for the computer lab exercises. The lecture room we use is well suited for this purpose, it can take our 35 students, tables and chairs can be shuffled around and the floor is flat. Essential infrastructure for modern education.

A key element in the design this year is also the introduction of an oral exam, worth 60% of the final grade. We combined this with a structured active learning approach, where lectures were replaced with interactive, student-centred, research-based methods as recommended in CWSEI and in many papers (Deslauriers, Schelew & Wieman 2011; Freeman *et al.* 2014; Hoskinson, Barger & Martin 2014; Wieman 2014a). In our specific setting, this involves a steady pace of two class meetings per week, working our way through the textbook. In these classes, students have to prepare before class, as they have to answer quizzes, both individually and collectively in groups using IF@AT forms – an engaging activity for students. We use Poll Everywhere as our common tool to communicate with students through mobile devises. This is a flexible and efficient tool that has replaced the 'clickers' that were used in the study by Deslauriers, Schelew and Wieman (2011), for instance. This opens for continuous dialogue with the students throughout the 2x45 minute periods we have available. In this setting, it is possible to monitor the level of understanding students have reached, and to tailor instruction to the problematic concepts and issues. We can put up a graph and ask students to point at a particular area or point of the figure from their mobile phones first individually, and then as a group after a short discussion. Alternatively, we can ask students to submit a few sentences to the screen as an answer to a particular question, which will appear as a cloud on the screen with all other answers. This reveals the state of understanding of students as a group, and is a very good starting point for instruction or discussion. Although we have only been trying this out for a few weeks now, it appears as a much more rewarding way of both teaching and learning than traditional lecturing. It feels as if learning this way will make knowledge stick (Brown 2014).

We do not assess the class activities. The whole class answer questions that are highly relevant to the oral exam, and our intention is to create constructive alignment, backwash, between the assessment and this learning activity. Coming to class and participating is an obvious practice for the oral exam, and we will see if this is sufficient motivation to prepare and read before class. So far, this seems to be the case, and the show up in class has been stable and high. As in TBL, the setting generate some social pressure in this direction, and the oral exam as well.

We kept two group projects and established fixed groups for class and projects, as recommended in TBL practices (Michaelsen & Sweet 2008). This and one individual written assignment with peer review count 40% for the final grade. Maybe this design strikes the balance between learning the basic theory and concepts, generic skill and critical thinking addressed in the ILOs

General reflections: I have learned the importance of setting ILOs at the right level for BIO201. The last two years I have also been responsible for BIO301, the advanced course in ecology, which is the next step for many BIO201 students. A gradual progression from unistructural to relational/extended abstract levels of understanding makes sense.

These three iterations of the course is one example of an experimental approach towards an improved course design. As in science, experiments are useless without hypotheses and theory, then it becomes just learning by trial and error (Chasteen *et al.* 2011). New ways to teaching can also be challenging for teachers, and my experience is that reading the research literature provides confidence. I have found it useful to discuss my thoughts with students, and showed them research justifying activities to add a meta-perspective on their own learning. The BIO201 iterations remind me of a discussion in my own research area, 'Adaptive Management', where it is argued that management should push the limits of fish stocks to learn about their dynamics. This practice has short-term risks and costs, but long term gains. Similarly, course transformation can involve costs and risks to teachers and students, but the long-term rewards are a more engaging experience for all parties.

CASE 3. SUPERVISION AND SUMMER SCHOOLS FOR PHD-STUDENTS

A substantial fraction of my teaching is in the form of post-graduate supervision. I have supervised or co-supervised 15 PhD students over the last 15 years. So far, all of them have finished on time, and become successful in research. Here, I will first reflect on what generates a good supervision environment for PhD students, and then present my engagement in PhD summer schools and plans for developing this educational situation further.

PhD training is active learning, inherently. Students are learning by doing and learn new things as they need it. Undergraduate teaching could benefit from becoming more like PhD education, with teachers teaching less and supervising more (Schmidt *et al.* 2010). The student- supervisor relationship is a critical element for completion, and it can be demanding at several levels, personally and intellectually. How can we develop working environments that remove obstacles and are productive to timely completion of PhD candidates? My personal experience is that an important factor is the research group. Again, acting as a collegium is a powerful tool, making use of the strengths of a larger group of researchers and facilitate the interaction between candidates and the whole group, including peer-to-peer interactions among PhD students. As with active learning, facilitating collaborations within groups of students, researchers and faculty generates more interactions, transferring knowledge and skills better and faster than in a single student-supervisor relationship. In our research group, this comes naturally as most PhD students enter into research projects with many others involved. We also have regular internal seminars where all PhD and MSc students present their recent progress to all group members, annual retreats where all participate and present their work, and we tend to think of PhDs as colleagues more than as students. This culture is not limited to the research group, but

includes the wider international scientific community, and a commitment to generate networks and opportunities for post-graduates. An important tool for this is research schools, or short summer- or winter schools designed for training future scientists. I have arranged several summer schools recently, and have more in the pipeline.

PhD summer schools as a transformational arena for early career scientists. Among the single most formative and motivational elements of my own research education experience was the participation at some PhD summer schools. During week-lasting meetings at some remote field stations, I had the opportunity to learn from and actively discuss my own research with some of the leading scientists. I have not found research on such courses on completion or retention of PhD candidates, but my intuition and personal experience suggest that these events can be transformational to early career scientists.

Recently I have made an effort to create these opportunities for PhD students, we need places where scientific communities can transmit strong scientific culture, values and traditions to the next generation. I have initiated the Hjort Summer schools – and raised funding for them in 2015 and 2016. In a new INTPART project (I am project leader) we secured funding for two more of these in 2017 and 2019. I have also organized one school in BSRS in 2016, and am invited to develop a permanent school in this setting starting 2018.

Consequently, I intend to take an experimental and reflective perspective on the design of these schools, with the goal of creating motivational, memorable and educational moments to teachers and students. Often, the formats of the schools are very traditional, with intensive lecturing from teachers. I see possibilities to develop schools that are more interactive and student-centred, where teachers are coaches and mentors. As an example, I arranged a panel discussion among the PhD students in the BSRS 2016 school: I picked an emerging environmental issue for discussion – the presence of microplastic in the oceans. I then divided students into two groups, one defending the position that this is a huge environmental problem, and the other group that it is not a pressing issue (it was difficult to recruit to this group). I allowed only core scientific literature as source to back any claim, and the references must be provided and made available to the other group. The groups had a day to prepare their case, presented their position, and then a plenary discussion at the end.

It was an amazing experience. Before we started all students were certain that microplastic in the ocean was a mounting environmental problem, but gradually the pendulum shifted towards a much more nuanced picture. The students would not stop debating, we had to adapt the time schedule and I had the impression that the discussions continued the following days. This simple exercise addressed a set of ILOs one could develop for such courses, critical thinking, scholarly debates, the risk of confirmation bias (this was evident in the groups, I tried to make them see how that affected their arguments afterward), and others. It made me aware of useful tool for later schools, and a motivation to experiment with similar activities in the future.

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