Teaching and Learning at TU Delft – Start Document

This document outlines the need for a vision, principles and guidelines on Teaching and Learning at TU Delft along with a detailed assignment to develop it. This vision will be created under a newly formed Teaching and Learning working group. The document is for internal stakeholders involved in the process of developing the Vision, Principles and Guidelines on Teaching and Learning (including blended, hybrid, online and face-to-face) and to build more clarity and alignment on the different aspects of the topic.

1. Background – Why?

The concern and interest of TUD for formulating a Vision, Principles and Guidelines on Teaching and Learning:

- **Quality assurance of teaching and education**

- **Professionalization of lecturers**

- **Defining and Formalizing Topics – 'blended' 'on campus', 'online' and 'Hybrid' Teaching and Learning.** During Covid, we have broadened our teaching methods and further explored the possibilities of online teaching and found that it sometimes has advantages over campus teaching. We want to maintain those benefits and we see that online/hybrid teaching will continue to be part of our future.

- **Clarifying expectations – to enable good support for teachers who ask for and need support.**

2. Scope of Assignment – What?

By creating a vision around teaching and learning we hope to provide a **clear, up-to date perspective and an aligned view on teaching at TUD**. Furthermore, this vision should **serve as a source of truth and inspiration** to initiate actions towards a **positive and inclusive study climate that focusses on wellbeing and growth for students.** The vision, guidelines and principles will specifically look at addressing how we can provide clarity on the **standards and support around teaching & lecturing at TU Delft** and **optimizing interactions between lecturer and student.** Therefore, it will not encompass education as a whole[1]. It will encapsulate the vast learning that has come from the experiences of the lecturers, education management and other actors at the university over the last two years, into a concise and valuable vision on teaching and learning. **The vision will be written from the perspective of the Lecturers** at the University by involving them through all stages of its development.

A. Goals of the working group:
- **Vision -** To sketch an inspirational view of the landscape and approach to teaching and learning at TU Delft and determine what it should be like; future vision and aspirations.
- **Principles -** To create high level goals/statements and align it with the values laid down within the TU Delft strategic framework. DIRECT (Diversity, Integrity, Respect, Engagement, Courage, Trust)
- **Practical Guidelines -** To make the vision actionable.

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[1] We want to bring together all relevant topics mentioned in this document on a TUD level about teaching; such as comments about didactics in Koers on Studiesucces, a greater focus on students and the developmental stages as promoted by Study Climate and the things we learned over the last years about hybrid and blended teaching. We do not want to interfere with the work concerning Master 2.0 e.g. curriculum structure in de Master.

- **Implementation Plan -** To come up with an implementation roadmap to reach the next level of teaching and learning at TU Delft.

B. Research/Design Questions:

The following questions will act as the framework to develop the vision on teaching and learning. Each question is further elaborated with related topics and sub-questions to be used for sessions/activities with the working group.

1. **What is good teaching?**
    a. Understand what is known in educational empirical research regarding high quality, effective, and efficient teaching and learning.
    b. What are teaching prerequisites based on evidence-informed principles of how learning happens and how lecturers can facilitate this process?
    c. How does good teaching contribute to good education?
    d. How do we improve the study experience at TU Delft? (Study Load, Metacognition and inclusiveness)
    e. What is inclusive teaching and learning? e.g. for those with disabilities
    f. What are problems or barriers with developing (new forms of) education?
    g. how we can use the campus for education, what is the purpose of the campus for teaching and learning?
    h. How can we provide clarity and support on teaching as per the phases of a student's journey (through their whole study) in order to ultimately improve student success?

2. **What is the role of the lecturer?**
    a. What are challenges and opportunities with teaching?
    b. Inspirer or Instructor?
        i. A coaching style where students are owner?
        ii. A master-apprentice style where teachers are owner?
        iii. Helping students from novice to expert?
        iv. Help students become professionals (from high school students)?
        v. Inspire students to broaden their view on the course but also the world?
    c. How can lecturers know their students (understand their needs) in order to determine how best to teach?
    d. Understand differences in the role of Lecturer for the Bachelor and Master.
    e. The lecturer should be the leading voice of input with regards to course development (within boundaries of the programme and the institution).
    f. Lecturers as a team and the role of teaching assistants within the team.
    g. Freedom (within boundaries) of Lecturers with regards to teaching style and assessment
    h. How can we give lecturers standards to reflect on themselves? and also be able to translate it to their teaching styles.
    i. Ethical behaviour, fraud, responsibilities.
    j. Available time for lecturers to develop themselves as educators as well as to develop education.
    k. What is the role of the Programme Director?

3. **What is the role of the student? (and what that means for the lecturer)**

      a. What are the needs of students when it comes to learning? (hidden needs and external needs)
      b. What is the role of the student in their own learning process?
      c. Ownership of their learning/Self-regulated learning.
      d. Student Success[2] - wellbeing, personal development, growth and learning. (What skills should students have?)
      e. Autonomy vs. Freedom vs. being lost
      f. Making conscious choices e.g.
          i. Groups for projects they want to be in
          ii. Thesis supervisor
          iii. Thesis topic
          iv. Company for their thesis work
      g. Ethical behaviour, fraud, responsibilities

4. **What is the role of the organisation? (and what that means for the lecturer)**
      a. What is the manner in which the institution can provide support towards teaching and learning?
          i. Teachers' support
          ii. Student support (student guidance)
          iii. Digital tools used in education.
      b. What is non-negotiable at TU Delft?
          i. Governance: the way in which the vision, principles and guidelines are translated to policies and rules.
          ii. Finance: The extent to which financial resources are allocated to develop, support and stimulate teaching and learning.
          iii. Facility management/Campus Real Estate
      c. Appreciating teaching relationship to research/Ratio between research and education.
      d. Clear communication about teaching principles etc. and easy accessible information about teaching.
      e. Quality Assurance/management (Link with NVAO and accreditation)
      f. Monitoring & Evaluation methods (link to the new WG Education Innovation of Marcus Specht).
      g. Security and Privacy Aspects (SPA)/Ethics.

C. **Boundary conditions necessary to realise the vision (statements):**

The following are an overview of statements that are to be taken as given conditions around the different topics of teaching and learning stated above.

1. **Educational goals and quality ambitions:** TU Delft provides high quality education and an inspiring, engaging and attractive study environment, which enables students to develop themselves into critical, result-oriented and socially responsible engineers.

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[2] **Student success** is looked at as a holistic concept which entails that students proactively create and are in charge of their own study path, study effectively, graduate in a timely manner whilst having the opportunity to personally develop themselves, with due attention to their well-being.

2. TU Delft strives to promote **Student success** which entails that students proactively create and are in control of their own study path, study effectively, graduate in a timely manner whilst personally developing themselves, with due attention to their well-being.
3. The TU Delft **education portfolio** and the expectations regarding our graduates should **constantly evolve** in line with technological and social developments in society and the world at large. (e.g. the UN Sustainable Development Goals, AI, Ethics etc.)
4. **Duration of Bachelors - 3 years**: All our bachelor programmes have a nominal duration of three full-time academic years (equivalent of 180 European credits). Students can/will take 3-4 years to complete it.
5. **Duration of Masters - 2 years:** Our default master programmes have a nominal duration of two full-time academic years (equivalent of 120 European credits). Students can/will take 2-3 years to complete it.
6. **We are a Campus University:** Advise of CvB to Studenten Onbeperkt about hybrid teaching
7. **Number of students/intake:** We will develop together clear guidelines on how to manage the growing student population, ensuring that the student-staff ratio is acceptable and the quality of education is guaranteed. Among others by assessing our educational programmes and investigating the possibilities for redesigning programmes (including assessment) to allow for both a large-scale and small-scale approach and effective organisation of education and student support. We will continue to discuss the optimal 'size' of our university with our stakeholders.(TU Delft Strategic Priorities, 2022-2024 Revised/Draft)
8. **All Graduates of the TU Delft are expected to master the following core competences for engineers:** critical thinking and reflection, carrying out research, designing, developing an academic approach, communication and collaboration in interdisciplinary and intercultural teams, taking into account the temporal and social context of technological solutions.
9. **Programme Development**: The program director/management team indicates, in consultation with the Lecturers/teaching staff, what the programme profile should be and which learning outcomes are assessed at which level in the curriculum. **Academic staff are expected to take responsibility, not only for their course(s) but for the quality of the whole programme.** The role of the team should include:
   o Composing the curriculum
   o What proportion of Transferable, Reflective, Engineering, Design, Science etc. skills should be developed within a curriculum.
   o Creating a (transparent) structure for the order of the courses, Compensation between courses, Courses stand on their own and are the building blocks of the curriculum – and are to be aligned with each other
   o Number of electives
   o Advice on what extent courses are on campus vs. online
10. **Number of electives for bachelor's and Master's** – To be identified from Master 2.0 and TER of every Programme.
11. (Digital) Exams/Assessments
12. Legalities to Teaching and Learning

3. Project Planning – How?

A. Approach:

The working group will Discover, Define, Develop and Deliver using the four overarching questions through the divergent and convergent double diamond design process.

B. Timeline:

November, December 2021 – Step 1

- Have the starting Document ready with feedback from Advisors (Listed in Appendix II).
- Form teaching and learning working group.

January, February, March, and April 2022 – Step 2

- **First Formulation of the vision, principles and guidelines:**
- To define /understand what is known in educational empirical research regarding high quality, effective, and efficient teaching and learning. – Evidence informed working[3]
- To define and build clarity on terms and concepts as and when we encounter them – (e.g. Hybrid teaching, self-regulated learning etc.).
- To define /understand the different topics identified under teaching and learning.
- To define / understand the different initiatives and existing scenarios around lecturer development (protocols, services and strategies that are already in place at the faculty and central level).
- To build clarity on the areas we can provide guidance and support in for lecturers, while aligning the values and principles to the overall TU Delft Vision on Education.

May, June, July 2022 – Step 3

- **Determining outcomes**
- Fine-tune Vision, Principles and Guidelines.
- Provide feasible and concrete actions that are achievable and beneficial for lecturers.
- Implementation Plan (including e.g. new support offer, suggestions on feedback methods etc.).
- Update and improve current strategies on teaching and learning at TU Delft.
- Spread the word: Share with the University and Faculties (e.g. presenting at Education days).

4. Deliverables (to be finalised as the project progresses):

- Document on Vision, Principles and Guidelines
- Presentation of the same
- Implementation roadmap – including communication strategy
- Additionally: Lecturer Journey map, golden rules of feedback etc….?

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[3] Evidence Informed work involves:
- Scientific literature as a basis for educational innovation
- Using (study) data,
- Using practical knowledge and practical experts correctly
- Approach based on a validated process model
- Monitoring, testing and practical research of one's own educational innovation.

(Suzanne Unck, 2021, *Onderbouw je onderwijsinnovaties*, Versnellingsplan.nl)

Appendix I:

Assignment from Rob Mudde - Vice-Rector Magnificus/Vice-President Education

The following is a list of advisors that will be consulted at the kick off and/or through the process of formulating the vision, principles and guidelines.

A: Advisory groups 1: Senior scientific staff and lecturers

Task: Review assignment to the working group and drafts of vision, principles and guidelines. Feedback regarding implementation.

1. Hans Hellendoorn - Vice President on Joint Education (chair)
2. Marcus Specht, Director 4TU/CEE
3. Joris Melkert - Director of Education (AES)
4. Ivo Bouwman – Director of Studies (TPM)
5. Nick van der Meijs – BsC Director of Studies (EWI)
6. Kristel Aalbers – BSc Director of Studies (Architecture)
7. Gerd Kortuem – MsC Director of Studies (IDE)
8. Ron van Ostayen - Programme Director BSc Mechanical Engineering (3ME)
9. Anton Akhmerov - Assistant professor (AS/QN)
10. Mart Vloet - Student Representatieve
11. Jeroen Hoving – Senior Lecturer (CITG)
12. Trivik Verma - Assistant Professor (TPM)
13. Nayantara Thomas – Project lead Study Climate Programme (ESA) (secretary/ trained in design method)

B: Working Group

Task: The working group will meet every two weeks and will use the design method to - step by step - talk to the different stakeholders, gather information, diverge, converge and come up with drafts to again, take to the stakeholders / advisory groups.

1. Hans Hellendoorn - Vice President on Joint Education (Chair)
2. Stella van der Meulen – Policy advisor (ESA, Cluster Student and Teacher Support, vice - Chair)
3. Bahareh Abdikivanani – Lecturer (EWI)
4. Bob van Vliet – Lecturer (3ME & AS)
5. Stefan Persaud – Lecturer (IO)
6. Sander Mulder – Lecturer (IO)
7. Jeroen Pruyn - Director of Studies for the BSc MT (3mE)
8. Roel Smit – Director of Studies TN (AS)
9. Jan Anne Annema – Director of Studies (TPM)
10. Wiebe Dijkstra – Coordinator blended learning developers (Teaching and learning services)
11. Grant Penny – Learning Developer (Teaching and Learning Services)
12. Sjoerd Zoeteman – Educational Psychologist (Teaching and Learning Services)
13. Gytha Rijnbeek – Programme Manager (Teaching Academy)

14. Linette Bossen - Educational Advisor (3ME)
15. Clara van der Heijden - Student representative
16. Julian van Dijk - Student representative
17. Mara Linssen - Student representative
18. Nayantara Thomas – Project lead Study Climate Programme (ESA) (secretary/ trained in design method)

C. Advisory group 2: Post docs, and PhD's with teaching experience and Teaching assistants

Task: Give feedback on drafts of vision, principles and guidelines. Dos and don'ts regarding implementation.

1. John Alan Pascoe - Assistant Professor (Aerospace)
2. Ines Uriol Balbin – PhD + lecturer (Aerospace)
3. Cinco Yu – PhD (Architecture)
4. Laura Barendregt – PhD (IO)
5. …

D. Advisory group 3: specialist support staff

Task: Give feedback on drafts of vision, principles and guidelines. Dos and don'ts regarding implementation.

1. Faculty Coordinators – Educational Development
2. Sasja van Warmerdam - Teacher skills, Loopbaancommissies of the faculty (HR)
3. Franca Jonquière – Head Teaching and Learning Services (ESA)
4. Geerlinge Pessers– Head Academic Services (ESA)
5. Danielle Rietdijk – Onboarding lecturers (Teaching and Learning Services TLS, ESA)
6. Marianne van de Werke – Head of ESA (CEG)
7. Vera Scheepens - Teaching and Learning Services (ESA)
8. Kolja Lane - Policy cluster Quality assurance (ESA)
9. Nida van Leersum - Policy cluster Portfolio (ESA)
10. Alexia Luising – UTQ (ESA)
11. Lisette Harting – Assessment TLS (ESA)
12. Sofia Dopper - Manager of support (Extension school)
13. Danika Marquis – Teaching and Learning Services
14. Themara Van de Boogerd – Consultant Education Spaces (ESA Education Logistics)
15. Tim Vermeulen – FM Coördinator zalenpoule (Facility Management)
16. Jelle Mak - Education Coordinator, Master's programmes (Architecture)
17. Marije Severs - Diversity and Inclusion Office (Strategic Development)
18. Gertjan Broekman - Academic counsellor (ESA Applied Science)
19. Eduard Pupupin – Student communication (ESA)

E. Advisory Group 4: Raad van Hoogleraren

1. Prof.dr.ir. Herman Russchenberg (CEG) (chairman)
2. Prof.dr.ir. Andy van den Dobbelsteen (BK)
3. Prof Marileen Dogterom (AES)
4. Prof.dr.ir. Marijn Janssen (TPM)
5. Prof.dr.ir. Geurt Jongbloed (EEMCS)

6.   Prof.dr.ir. Fred van Keulen (3mE) (Vice-President)
7.   Prof. Sabine Roeser (TPM)
8.   Prof. Pieter Jan Stappers (IDE)
9.   Drs. Meike Blokland (HR management/secretary)

Appendix II:

Background – Why:

TU Delft aims to transition to an engineering education that leverages the full range of human potential: from the technical to the social and personal domains and facilitate a supportive environment that allows students to discover the (full spectrum of) knowledge, skills and mind sets they need to study effectively and become resilient, autonomous and responsible engineers. A key component to this *supportive environment* are the lecturers. TU Delft has focused on the quality of education and lecturers in all sorts of ways[4] and it is reflected, in the Vision on Education from 2017. However, with the ever-changing landscape there are various different aspects[5] to keep in mind in order to continually provide the best quality of education.

The COVID-19 crisis prompted a relook at 'TU Delft's Education Strategy' and 'Vision on Education' and a Strategic Response team specific to 'Quality of Education' was created. They have formulated recommendations to maintain the high quality of education at TU delft. Eight critical success factors were identified from which recommended actions were developed. These actions do not constitute a complete list however, it lays the groundwork to continue to provide good quality education by capitalising on what worked during the pandemic and avoiding pitfalls that were faced. Important themes that came up from this include, having hybrid education that is intentional and with purpose, understanding where online teaching and on campus teaching is appropriate, serving large groups of students while ensuring that personal attention is not lost and providing the best possible support for lecturers regarding the use of digital resources as blended learning is the (unavoidable) future.

"An important threat to avoid is the loss of momentum and initiatives falling back on a pre-crisis education."
(SRT Educational Quality, 2021)

The learning experiences for students must be equal and optimal in both situations (online/on campus). This requires teacher training, but also high quality technical facilities and support. Furthermore, the admissions process is also a very important aspect to consider. In the coming years, TU Delft will focus on optimizing the Study climate through a culture change process that essentially focuses on bettering the study journey for

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[4] Make sure that our educational programmes are aligned with the latest developments in the research activities of lecturers). Stimulate our academic teaching staff to continuously develop themselves, both as researchers as well as lecturers, strive for a healthy balance between research and teaching activities and reward teaching excellence. Provide clear career paths for academic teaching staff which takes into account their teaching achievements.

[5] This includes, the increasing pace of technological change, globalisation and accelerating digitisation of our economy and social interactions, a strong growth in the international mobility of both students and staff, changing features of the student population based on changes in society, shifts in the public funding of higher education, rising enrolments leading to a large student population and increased pressure on staff and facilities, growing competition for research funding, challenges of balancing education, research and valorisation activities as well as the breakthrough of massive open online courses and other forms of digitally enhanced teaching and learning.

students. Lecturers play a crucial role in the study climate and in education and it is in our value to hone a culture/climate in which they are sufficiently supported and guided to do so.

Working Definitions:

1. **Blended learning** refers to learning as a result of a deliberate, integrated combination of online and face- to-face learning activities.
2. **Metacognition and self-regulation** approaches to teaching support pupils to think about their own learning more explicitly, often by teaching those specific strategies for planning, monitoring, and evaluating their learning.
3. **Hybrid teaching** refers to synchronous teaching sessions attended by both face-to-face (in class) students and online students.
4. **Blended teaching** refers to designing and facilitating blended learning activities.
5. **Blended education** is the formal context in which blended teaching and learning take place, determined by policies and conditions with regard to the organization and support of blended teaching and learning.
6. **Hybrid Exam** is a written exam that is administered both on campus and remotely at the same time. Both exam modes have the same assessment method (written exam).

Documents and Resources:

- Strategic Response Team for Educational Quality (2021)
- TU Delft Vision on Education 2017
- TU Delft Strategic Framework 2018-2024 (Impact for a better society)
- Faculty Visions:
  - 3ME – vision on education
  - The Educational Vision of the Faculty of Civil Engineering and Geosciences (2021)
  - Autonomous Learning – IDE Bachelor TU Delft (2021)
- Vision on teaching and learning: Learning@LeidenUniversity
- Student Guidance Vision
- Study Climate Programme Strategy
- Assessment policy MSc. programmes faculty of civil engineering and geosciences
- UTQ Competencies: https://intranet.tudelft.nl/-/utq-competencies-1
- TU Delft Teaching Academy
- European Maturity Model for Blended Education
- Engineer of the Future
- Student Wellbeing Surveys
- EEF_Metacognition_and_self-regulated_learning : Metacognition and self-regulation | EEF (educationendowmentfoundation.org.uk)

Appendix III

Relevant Literature:

- Different functions of education by Biesta (2009). He highlights education – apart from *qualification* - also shapes how students become part of existing socio-cultural paradigms (*socialization*) as well as has an individuating effect which helps them to be more autonomous and independent *(subjectification)*. Thus, apart from domain-specific (discipline-related, technical) knowledge and competences, it is equally important that students learn competences and develop in the personal and social fronts through the education provided at TUD. Examples of these social and personal competences include self-management, self-awareness, interpersonal skills, social responsibility amongst others.

- Rosenshine (2012). Principles of instruction: https://www.aft.org/sites/default/files/periodicals/Rosenshine.pdf

- Merrienboer & Kirschner (2017). Ten steps to complex learning: https://www.bol.com/nl/nl/p/ten-steps-to-complex-learning/9200000078692325/?bltgh=pvbf6YEdXO8nPsvTU5hEiQ.2_9.11.ProductTitle

- Hirsch (2019). Why knowledge matters: https://www.bol.com/nl/nl/p/why-knowledge-matters/9200000103896844/?bltgh=mO-C-1foQGjiy-PhX31GKg.2_9.12.ProductTitle

- Kirschner & Neelen. 3 Star Learning Experience, An Evidence-Informed Blog for Learning Professionals (BLOG): https://3starlearningexperiences.wordpress.com/

- Hattie (2008). Visible Learning: https://www.bol.com/nl/nl/f/visible-learning/30526397/. ECHTER, er is ook redelijk wat kritiek op dit werk van Hattie. Zie bijvoorbeeld: http://renekneyber.nl/?p=103

- Fullan (2009). The challenge of change: https://www.bol.com/nl/nl/p/the-challenge-of-change/1001004006475372/?bltgh=r9IDL8bSPaw3E2SgDgtANQ.2_9.23.ProductTitle

- Wiggins and McTighe. Understanding by design: https://www.amazon.com/Understanding-Design-Grant-Wiggins/dp/1416600353

- Learning Styles as a Myth | Poorvu Center for Teaching and Learning (yale.edu)

- Universal Design for Learning