

Toetsing realisatie voorwaarde(n)

nieuwe opleiding

wo-ma Data Science and Entrepreneurship

Tilburg University , Technische Universiteit

Eindhoven

17 mei 2017

Inhoud

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1 Beschrijving van de opleiding

1.1 Algemeen

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| Instelling: | Tilburg University Technische Universiteit Eindhoven |
| Opleiding: | wo-master Data Science and Entrepreneurship (joint degree) |
| Variant: | voltijd |
| Graad: | Master of Science |
| Locatie: | Den Bosch |
| Studieomvang (EC): | 120 |
| CROHO-onderdeel: | techniek |

Voorstel voor indeling in een visitatiegroep: To be addressed in due course, ultimately two years before re-accreditation.

2 Beoordeling realisatie voorwaarde(n)

In haar besluit van 31 maart 2016 over bovengenoemde aanvraag Toets nieuwe opleiding (004364) kwam de NVAO tot een positief besluit onder voorwaarde). Er werd een voorwaarde gesteld, waaraan binnen een periode van anderhalf jaar diende te zijn voldaan. De betrokken instelling heeft daartoe bij brief van 27 maart 2017 een aanvullend dossier ingediend bij de NVAO. Op verzoek van de NVAO heeft het panel op 19 april 2017 beoordeeld of de instelling daarmee aan de voorwaarde uit het accreditatiebesluit heeft voldaan. Het paneladvies kwam tot stand via een aanvullend locatiebezoek en een paneloverleg op 19 april 2017.

2.1 Voorwaarde

The condition as formulated in the assessment report of the panel in February 2016:

“The panel notes that entrepreneurial competences are not sufficiently defined into the intended learning outcomes and the content of the program. The discussions with the management and lecturers showed that the definition of entrepreneurship needs further clarification and the program should be more systematically designed to ensure achievement and assessment of these competences. Although several aspects of entrepreneurship are part of the program and integrated in the various courses this needs further development, clarification and structured assessment. Additional information presented during the site-visit and the discussion of this information with the lecturers convinced the panel that it is possible to design the ‘line on entrepreneurship’ in a structured manner within a short period of time. The panel however, finds that the vision on and the development of entrepreneurial competences in the curriculum and the assessment there of must be made more explicit. Since entrepreneurship is at the heart of the intended learning outcomes the panel insists on a more systematic implementation of entrepreneurship and the evaluation of entrepreneurial competences in the program with the full confidence that all conditions are present to do so successfully, and at relative short notice”.

“Even though the panel is confident that all conditions are in place to adequately address the entrepreneurial competences in the program, it insists on a more systematic implementation of Entrepreneurship in the program. This requires making the vision on, development of and assessment of entrepreneurial competences more explicit and systematically in line with each other. Since entrepreneurship is a significant characteristic and unambiguous goal of the program, the panel finds this key to the success of the program. Therefore the panel decides to assess standard 2 as ‘partially satisfied’ and advises the Board of the NVAO to decide ‘positive’ on this application under the condition that the program will show repair on this aspect in the near future”.

The condition as formulated in the decision by the NVAO 31 March 2016.

Entrepreneurship should be implemented more systematically in the program. This requires making the vision on, development of and assessment of entrepreneurial competences more explicit and systematically in line with each other.

Findings and assessment by the panel: additional assessment on meeting the conditions.

To demonstrate that the conditions are fulfilled the program provided the information document: "Entrepreneurial Competences in the Master Data Science and Entrepreneurship". The panel studied this document in preparation of a short site-visit at the Jheronimus Academy of Data Science (JADS) in s-Hertogenbosch on the morning of the 19th of April 2017. During this site-visit the panel conducted two interviews. The first with the management and the developers of the program, the second with lecturers and a student. The panel formulated conclusions and a brief preliminary feedback was presented by the chair.

The information document and the site-visit offered the panel additional and new information on the systematic implementation of Entrepreneurship in the program.

The document starts from a description of the vision on teaching Entrepreneurship and demonstrates how this is translated into learning objectives of the program. This is followed by an explanation of how specific courses contribute to these learning objectives and the choice of the appropriate didactical approach, characterized by 'learning-by-doing' and evidence based learning. The document elaborates on the assessment of entrepreneurial competences; and information is given on the organization, governance and quality assurance of the teaching and learning environment. Further it gives a good picture of the actual implementation of entrepreneurship in the program delivery as it is implemented recently.

The interviews substantiated the information in the document. The interviewees argued convincingly that the design of the line on Entrepreneurship in the program, has been subject of reconsideration, strengthened in some respects and consistently implemented.

The program did start in the beginning of this study year, thus the first actual results could be shown. The program also had first evaluation results available, which have been included in the inquiry of the panel. The interviews had an open character and the team was enthusiastic about the innovative multidisciplinary endeavour, demonstrated a shared vision on the program, proved to be able to find solutions for the new challenges and demonstrated a willingness to acquire the new competences needed in this program. If needed new team-members will be recruited to bring in specific entrepreneurial or coaching skills. The panel was satisfied by this attitude. The program will definitely be able to develop and deliver a state-of-the-art line on entrepreneurship.

The program argues in the document that the entrepreneurial competences are well balanced with the data science competences and the general competences of the program. But central is the ability to create, capture and value data in a variety of markets. This connects to societal demands as is illustrated by the Big Data Value Strategic Research and Innovation Agenda (SRIA) of the European Union in which value creation is the central research question.

The program aims to qualify entrepreneurs for different contexts, including commercial use, but always with an emphasis on responsible data-science. To this end, the program addresses ethical and legal matters.

The vision on teaching entrepreneurship is based on the results of scientific meta-review and thus based on growing consensus on effective and evidence based learning of entrepreneurship. The choices made by the program in the design of the line of entrepreneurship are substantiated by scientific articles demonstrating the importance of the experience oriented approach and learning. The panel appreciates these articles as relevant and providing appropriate direction for the program design. Acquiring entrepreneurial competences goes beyond teaching cognition and also includes training of the necessary skills and abilities in realistic situations.

From the interviews the panel learns that the vision is broadly shared by the team and known by the student. Concrete examples of the way the vision is translated into courses convinced the panel that the vision is actually leading the lecturers in the design of the program.

The program presents a framework encompassing a wide palette of knowledge areas and skills. The dossier contains a clear and exhaustive summing up of the learning outcomes of entrepreneurship. These are divided into 1) Knowledge and understanding; 2) Applying knowledge and understanding and 3) Learning skills.

The panel appraises the learning outcomes as formulated in the dossier positively. It clearly shows relevant knowledge and needed attitudes and skills and in addition to that competences to develop further/learn as an entrepreneur.

The vision and the learning outcomes have been the leading guide in the design of the learning and teaching environment. In the dossier and the interviews the program demonstrates that the intended learning outcomes have been translated into course objectives.

The dossier contains a table proving that each of the Entrepreneurial Learning Objectives is addressed in at least two courses and the Master thesis. Restrictive electives have been introduced to ensure appropriate occurrence of the learning objectives in all possible combinations.

The program consists of a number of core entrepreneurial courses such as Strategy & Business Models, Entrepreneurial Finance, Entrepreneurial Marketing, Corporate Entrepreneurship, and - to a lesser extent - Business Analytics. Additionally, there are a number of courses in which knowledge on entrepreneurship, and entrepreneurial skills and attitudes are combined with technical (data) capabilities. Examples are the three Data Entrepreneurship in Action courses (which constitute the backbone of our program), the Data/Corporate Entrepreneurship course (in which students create their own venture), and the Master thesis.

In the Data Entrepreneurship in Action courses students are asked to resolve a real-live business problem based on real-life data sets. The panel discussed availability of these data-sets. In the interviews it became clear that the specific setting of the program in an extended eco-system of relevant firms and organisations provides ample sources of material for teaching in real-life situations and mentoring. JADS is related to rock-start and incubator initiatives, partly within the same building. Building the network is a structured activity. Part of this is the requirement of mentors for the program. These mentors participate in several roles within the program, as guest-lecturer, external assessor, supervisor of internships, deliverer of data-sets, etc.

The eco-system is a strong asset of the program according to the panel and convinces the panel that the didactic concept is and can be realized.

The Data Entrepreneurship in Action courses in this manner are able to provide experience based learning in realistic settings involving external mentors. This is central to the vision of the program. In addition to these courses the students are asked to start their own venture in the course data Entrepreneurship which is launched as a part of the Master thesis.

The guidance of this learning by doing is sustained by a well-defined mentor and coaching network.

The assessment of the entrepreneurial competences is incorporated in an extensive assessment plan. This plan is presented in the information dossier. Assessment types used are: Summative assessments, formative assessments, authentic or work integrated assessments, synoptic assessment and criterion referenced assessments. For each of the learning objectives the assessment form is indicated.

Scientific personnel remains leading in the assessment of the students to preserve academic standards at Master level, but (formative) feedback is also provided by external mentors and coaches.

The assessment program is intensive and well structured. Feedback is more than sufficient. Students are reasonably well informed on what is expected and will be criteria for the assessment. Also the coaching sessions help students to reflect on their development as a data-entrepreneur.

Interesting is that the program uses scientifically proven assessments, e.g. personality tests, team skill assessments in combination with insights of coaches and mentors. This offers to the students ample feedback to grow as an entrepreneur and realize the learning objectives. The development of the entrepreneurial skills by a student is followed in a systematic manner by the use of a 'strippenkaart'. Students have to demonstrate the skills in several assignments, e.g. pitching. Specific coaches are/ will be recruited to teach these skills, provide feedback and if needed additional individual training. The panel was impressed by the manner in which skills are integrated in the Data Entrepreneurship in Action courses and the individual follow-up. The program is aware of the specific nature of entrepreneurial competences and the need to recruitment of specialized lecturers. In addition the team showed a willingness to acquire these skills and the combination of lecturers from both Eindhoven and Tilburg University also secures the integration of technical with entrepreneurial skills.

The 'line on entrepreneurship' in the program is sustained, developed and ascertained by the organization, governance and quality assurance of the program.

The panel is convinced about the qualities of the teaching staff to deliver the line on entrepreneurship at an academic Master level. Relevant research skills, entrepreneurial skills, legal and ethical concerns are well represented.

A concern of the panel is the possibility to grow; to sustain the quality of the program if the number of participants will rise. In the interviews the panel learned that the team is well aware that it has to be able to accommodate this growth. Preparations are made, staff is recruited in anticipation of the growing student numbers, but still the intensive individual

coaching and feedback might need some formalisation, for a start to keep all student projects apart. This has to remain a point of attention.

In conclusion: by reading the documents and discussing the program the panel found that the vision of the program is well elaborated as a result of a collective effort by the team. Since the previous visit of the panel this vision has been more clearly articulated, strengthened on the aspect of entrepreneurial skills and extensively discussed before implementation in the curriculum.

The program demonstrates that the learning by experience and the entrepreneurship are the heartbeat of the program. Assessment is followed by coaching structured by a Personal development plan.

The development of the student as an entrepreneur and the learning by experience are well sustained by the network of the program. The unique JADS ecosystem, in which it is embedded, relates it to many partners and data science businesses. At the moment the campus in Den Bosch is in full operation, start-ups and research will be in the proximity of the program.

Students are faced with the real-life challenge of starting a (corporate) venture in practice during the program and in all its aspects as parts of the Master thesis. The thesis consist of 1) a Proof of Concept (PoC)/ minimal viable product (MVP), 2) a feasibility study, and 3) a scientific report.

The quality assurance instruments facilitate the monitoring and reflection on the realization of the objectives of the program. The instruments consist for instance of: coordination meetings and course evaluations that will be discussed by the program committee. Furthermore the panel is convinced by the ambitions and involvement of the lecturers in the JADS endeavour. The team demonstrates to reflect, learn and improve consistently. There is a board group including students and lecturers that also will discuss and evaluate course quality. First evaluations show that students are very satisfied with facilities, courses and program structure. The dossier however states: "At the same time, it is evident that we are continuing our diligent efforts to reinforce the program". A new program always needs further development, but the panel is convinced that this program will develop into a best practice of teaching entrepreneurial competences. A consideration is the preservation of the quality by growing student numbers. This has to remain a point of attention.

The panel concludes that the requirements are fulfilled.

Op grond van het bovenstaande concludeert het panel dat aan de voorwaarde(n), verbonden aan het positieve besluit onder voorwaarde(n) voor de Toets nieuwe opleiding van de wo-master Data Science and Entrepreneurship (joint degree) van de Tilburg University en Technische Universiteit Eindhoven, is voldaan. Het adviseert de NVAO daarom een onvoorwaardelijk positief besluit te nemen over de aanvraag TNO wo-master Data Science and Entrepreneurship (joint degree) van de Tilburg University en de Technische Universiteit Eindhoven.

Marianne van der Steen
(voorzitter)

Frank Wamelink
(secretaris)

Bijlage 1: Samenstelling panel

- Marianne van der Steen (chair), professor of Entrepreneurship in Healthcare at the Faculty of Health, Medicine and Life Sciences, Maastricht University and director of the foundation REGMED XB
- Wim van Petegem, professor at the Faculty of Engineering Technology at KU Leuven, Policy coordinator Learning Technologies at the Faculty of Engineering Technology. Involved in research, development and implementation of multicampus engineering education, with special focus on internationalisation, innovation, entrepreneurship, development cooperation, and profiling
- Maarten van Steen, professor distributed systems at the University of Twente, scientific director of CTIT, and chair of IPN, a national platform representing all academic ICT research in The Netherlands.
- Lennart van Doremalen (student-member) Phd candidate subatomic physics, Utrecht University.

Alle panelleden hebben een onafhankelijkheids- en onpartijdigheidsverklaring ingevuld en ondertekend (zie dossier 004364).

Het panel werd bijgestaan door Frank Wamelink, beleidsmedewerker NVAO, procescoördinator en secretaris.

Bijlage 2: Bezoekprogramma

Woensdag 19 april 2017, 9.30 uur;

Jheronimus Academy of Data Science
Sint Janssingel 92
5211 DA 's-Hertogenbosch
The Netherlands

<http://www.jads.nl/contact.html>

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| 09.30 uur | Aankomst |
| 09.30-10.00 uur | Intern overleg binnen de commissie |
| 10.00-10.45 uur | Gesprek 1: opleidingsmanagement en verantwoordelijken curriculumontwikkeling |
| Opleidingsmanagement | |
| Willem-Jan van den Heuvel (Opleidingsdirecteur) | |
| Ksenia Podoyntsyna (Adjunct Opleidingsdirecteur) | |
| Carlien Geelkerken (Hoofd Onderwijs) | |
| Verantwoordelijken voor relevante delen van het curriculum | |
| Arjan van den Born (Vakoverstijgende Visie Entrepreneurship) | |
| Sandra van Dongen (Entrepreneurial Skills & Coaching) | |
| 10.45-11.00 | Pauze |
| 11.00-11.45 uur | Gesprek 2: docenten en student uit de opleidingscommissie |
| Betrokken docenten | |
| Annelies Bobelyn (Data Entrepreneurship in Action I en Corporate Entrepreneurship & OC-lid) | |
| Bas Bosma (Coördinatie Data Entrepreneurship in Action) | |
| Jack van Wijk (Data Visualisation) | |
| Eric Postma (Data Entrepreneurship in Action II) | |
| Martijn Willemsen (Cognition & Creativity) | |
| Student | |
| Lucas Otten (OC-lid) | |
| 11.45-12.15 uur | Intern beraad binnen de commissie |
| 12.15-12.25 uur | Feedback door de commissie |

Het adviesrapport is tot stand gekomen in opdracht van de NVAO met het oog op toetsing realisatie voorwaarde(n) nieuwe opleiding wo-master Data Science and Entrepreneurship (joint degree) van de Tilburg University en Technische Universiteit Eindhoven

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