



University of Applied Sciences Professional Doctorate

A professional degree programme focusing
on practice-based research



Vereniging Hogescholen

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'Learning to make interventions in complex business practices'

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Executive summary

The Bologna process of the European Union has led to a higher education system throughout Europe consisting of three cycles: bachelor's programmes (level 6), master's programmes (level 7) and doctoral studies (level 8). In September 2019 the VSNU and the VH¹ jointly drafted a position paper about further developing the binary system. In this paper, they stated that a third cycle in the universities of applied sciences could be a valuable addition to the current system of higher education (VH and VSNU, 2019) provided a number of conditions are met. In December 2019, the Minister of Education, Culture and Science asked the higher professional education sector in her strategic agenda for higher education and research to make a proposal for designing a third cycle taking into account the prerequisites as stated in the VSNU-VH position paper (Ministry of Education, Culture and Science, 2019). This document contains a proposal made by a programme team consisting of representatives from seven domains and eight universities of applied sciences and the VH for pilots of a University of Applied Sciences Professional Doctorate (UAS-PD).

The UAS-PD is equivalent to and different from the PhD and the PDEng (see Box 1). It is an important addition to the educational landscape, and enables us to have a continuing learning pathway of bachelor's, master's and doctorate programmes with a professional/vocational orientation. The PD programme helps to meet the increasing need for 'inquisitive professionals': highly skilled professionals who can address complex profession-oriented knowledge and -design questions, and thus contribute to sustainable innovation. The programme also contributes to further profiling and professionalising practice-based research in higher professional education.

The UAS-PD programme is a professional degree programme with a duration of three to four years. It trains students to become highly-skilled inquisitive professionals who 'learn to make interventions in complex business practices' at EQF level 8. PD candidates will learn 'practical knowledge', learn to develop processes and products to bring about and validate interventions made in complex issues. The European Qualifications Framework for lifelong learning (EQF) level 8 states that it explicitly allows for room for such a professional degree programme aiming at work, innovation and professional practice.

Higher professional education wants to start with a first cohort of candidates as a pilot in 2022. To that purpose, the following clusters are currently engaged in design activities: Art & Creative, Energy & Sustainability, Health & Well-being, Maritime & Leisure, Tourism & Hospitality. The clusters Education and Technology & Digitisation will join them as soon as possible. This proposal describes the framework for these pilots. The framework has been formulated 'strictly' with regard to a number of points, such as the point of examinations. After the pilots, more freedom might be allowed for degree programmes as far as these points are concerned. At the same time, everything has not been worked out yet, and it will be possible to find joint norms during the pilots.

The PD programme will be offered by a Graduate Network per cluster, a partnership of universities of applied sciences who will jointly develop the programme profile, the supporting courses, the assessment model and other programme components. Cooperation with universities from the Netherlands and abroad in the Graduate Network might be of help.

1 'VH' is the Dutch abbreviation of the Netherlands Association of Universities of Applied Sciences

The Graduate Committee of this network will be responsible for the quality of the programme and on behalf of this committee the degree will be conferred by the individual university of applied sciences of the (first) supervising professor. The PD programmes will be visited by a PD Validation Committee (PD VaCo) [working title] in advance and every four years. The following parties will take part in these visitations: representatives of (regional) employers/industry partners (Higher Education Committee of VNO-NCW / MKB Nederland), representatives of the profession and representatives of knowledge institutes.

A supervisory committee will be in charge of supervising students; it will be chaired by a professor. This professor will act as supervisor, and has the right to nominate a candidate for assessment. Furthermore, two external professionals from business practice will be supervisory committee members. They will be directly involved in the real-life issue, have a PhD or PD or an equivalent level of professional and intellectual ability, and act as 'critical friend'.

An assessment committee will be in charge of assessments, during which they distinguish between supervising and assessing students. The assessment committee will consist of a member from the community of professors within the relevant domain and three members who will be nominated by the supervising committee and are a reflection of stakeholders in the supervising committee. In the pilot phase, the position of chair will be filled by a member of the VaCo-PD. The basis for assessment will be a portfolio of evidence that does justice to the programme profile of the PD programme.

A first estimate has been made of the costs of the PD pilot. The estimated development costs are €3.5m. In 2021, the clusters will further elaborate their PD programme, and the infrastructure for quality assurance will be created. 125 PD candidates will start in four cohorts. Implementation costs of these pilots to be paid by universities of applied sciences are estimated at €13.5m. So, total costs for universities of applied sciences to be paid for these pilots will be €17m. Furthermore, wage costs for the intended 125 PD candidates will be a significant cost item for this development. Within the time frame of the pilot, these costs will be €37.2m. Together with the travel expenses and study costs amounting to €1.5m, total costs of the pilot will be €55.7m. It still needs to be worked out in a separate project how to finance this amount, and who pays for what part of the costs.

Box 1: Characteristics of UAS-PD, PhD and PDEng

	UAS-PD	PhD	PDEng²
Characterisation	Professional degree programme training students to be inquisitive professionals that learn to make interventions in complex business practices	Academic programme training students to become academic researchers that learn to do scientific research independently	Design programme training students to become engineers that learn to design in a professional context
Proceeds	Creating generic new practical knowledge, processes and products for realising and validating interventions in complex issues	Creating generic new conceptual knowledge contributing to a scientific knowledge basis and extending the boundaries of the area of science	Creating specific new technical solutions for products, processes and systems based on functional requirements and market requirements
Main way of learning	Learning on-the-job as a result of the candidate working on a real-life issue, and learning to develop, assess and if possible, implement interventions	Learning as a result of the candidate carrying out a major scientific research	Learning as a result of the candidate converting requirements into specifications, developing a concept, and validating and concretising it in relation to the specifications
Role of modular courses	Supports learning on-the-job. Total of modular courses: 30-60 credits	Supports acquiring academic skills. Number of credits varies	Is half the curriculum (60 credits)
Admission requirements	Relevant master's programme plus relevant experience in the complex professional practice in the same field	Academic master's programme	Academic master's programme
Domain	Art + Creative, Energy & Sustainability, Health & Well-being, Maritime and Leisure, Tourism & Hospitality. Afterwards: clusters Education and Technology & Digitisation	Academic disciplines	Technology
Method of assessment	Peer review of a portfolio of evidence by professors and stakeholders	Peer review of a doctoral thesis by academic scientists	Peer review of a final product leading to a technical design by an evaluation committee
Duration	3 to 4 years depending on prior knowledge, experience and nature of the programme	4 years	2 years

² Based on Diploma Supplement Professional Doctorate in Engineering programmes (<https://www.4tu.nl/sai/en/education/pdeng-degree-supplement.pdf>) and Assessment Criteria (<https://www.4tu.nl/sai/en/education/assessment-criteria/>)

1 Introduction

The Bologna process of the European Union resulted in a system of higher education throughout Europe consisting of three cycles: bachelor's (level 6), master's (level 7) and doctoral programmes (level 8). Since the arrival of professors in 2001, there have been discussions in the Netherlands about whether the universities of applied sciences would also be allowed to offer education for the third cycle. In 2005, for example the discussion was held when a new Higher Education Act was being prepared, but this law was not passed at the time (Van Gageldonk, 2017). In 2015, the VH expressed its ambition that professors would be given the right to supervise doctoral students (Vereniging Hogescholen, 2015). In July 2019, eight universities of applied sciences released a position paper in which they aim to establish its own third cycle in the universities of applied sciences (Amsterdam University of Applied Sciences et al., 2019).

This development does not stand alone. Compared with other countries, the Netherlands has a relatively low number of people in its working population educated at level 8, and is well behind countries such as Switzerland, the United States, the United Kingdom, Germany, France and Belgium (Jongbloed, Kaiser, & Kottmann, 2019). For the benefit of our knowledge economy and international competitive position, it is necessary to increase the number of people educated at level 8 in science and in the business sector. The latter category is also of major importance to our knowledge economy. People educated at level 8 are the driving force for (conducting) research and generating innovative knowledge in many disciplines. An innovative knowledge economy requires more people educated at level 8 in the business sector as well as better alignment between degree programmes and future careers of people educated at level 8.

In August 2019, the VSNU and the VH jointly wrote a position paper about further developing the binary system, in which they stated that a third cycle in the universities of applied sciences could be a valuable addition to the current higher education system (Vereniging Hogescholen and VSNU, 2019), provided that some conditions are met. In December 2019, the Minister of OCW asked the universities of applied sciences sector in her strategic agenda for higher education and research to make a proposal – in line with the above – for designing a third cycle taking into account the prerequisites as articulated in the VSNU-VH position paper (Ministry of Education, Culture and Science, 2019). A programme team consisting of representatives of seven domains and eight universities of applied sciences as well as the VH made a proposal in this document. The proposal outlined the design of a Professional Doctorate of Universities of Applied Sciences (abbreviated to UAS PD2). This proposal was in line with the characteristics described in the position paper of VH and VSNU (Vereniging Hogescholen and VSNU, 2019, pp. 11-12):

- 1 *“From entry qualifications, exit qualifications, naming and (academic) titles of third-cycle degree programmes, it should clearly appear that the third cycle in the universities of applied sciences fits in with the starting point ‘equivalent, but different’ that characterises the Dutch binary higher education system. [...]”*
- 2 *It concerns an independent, full and internationally recognised third cycle in the universities of applied sciences, leading to a professional doctorate (PD). The third-cycle degree programmes within universities of applied sciences are in line with the profession-oriented character of the universities of applied sciences.*
- 3 *The tracks within a third cycle in the universities of applied sciences are a clear answer to a(n) (applied) request from the business sector or society at large, for example for innovating professional practice or for students who have completed this third cycle.*

With the third cycle, universities of applied sciences also work on strengthening their own research culture, professionalising lecturers and the research component of their degree programmes.

- 4 *The quality of these third-cycle programmes will be assured in an independent, accessible and verifiable way. Universities of applied sciences will account for this periodically.*
- 5 *The funding of these degree programmes should not be at the expense of existing education and research budgets."*

In 2022, higher professional education wants to start with a first cohort of candidates as a pilot. To that purpose, the following clusters are currently engaged in design activities: Art + Creative, Energy & Sustainability, Health & Well-being, Maritime and Leisure, Tourism & Hospitality. The clusters Education and Technology & Digitisation will join them as soon as possible. This proposal outlines the framework for these pilots. This framework has been formulated strictly as to a number of points, such as the point of examinations. After the pilots, more freedom for degree programmes might be possible as far as these points are concerned. At the same time, everything has not been worked out yet, and there will be a possibility to find joint norms during the pilots.

Chapter 2 shows a brief characterisation of the UAS-PD programme. In chapter 3, the added value to be expected is shown. Chapter 4 gives an overview of qualifications to be achieved by candidates who have successfully completed the PD programme. These qualifications follow the Framework for Qualifications of the European Higher Education Area (QF-EHEA) – also known as the Dublin Descriptors – and the European Qualifications Framework for lifelong learning (EQF) level 8. Also, a comparison is made with professional master's programmes and the PDEng, which is offered by universities of technology in the Netherlands.

Chapter 5 gives the pilots guidelines for drawing up a programme profile, in which it is stated what type of professional the programme trains its students for. Chapter 6 gives frameworks for designing the programme. Chapter 7 gives an overview of all measures that have been provided for to monitor the quality of the programme and diploma/degree certificate. In chapter 8, a very preliminary calculation is made of the development and implementation costs of the pilots, and first ideas are given about their financing. However, a separate process will be initiated to elaborate on this. The final chapter outlines the following steps that need to be taken to be able to start in 2022.

2 Characterisation

The UAS-PD programme is a professional programme training students to become highly-skilled inquisitive professionals who 'learn to make interventions in complex business practices' at EQF level 8. PD candidates learn to develop practical knowledge, processes and products for accomplishing and validating interventions if complex issues are at stake. This is an addition to the existing PhD programmes of universities that primarily educate students to become independent researchers. During their doctorate programme, PD candidates make a contribution to the development of knowledge for the benefit of science and via this way, society at large. In doing so, they will also familiarise themselves with the methods of science used when conducting research into all sorts of social and industrial problems.

The PD programme educates students to become inquisitive professionals who, in the first place, develop new generic knowledge of new interventions regarding a relevant challenge in society or industry, with possible effects for science, for example by publishing articles in scientific journals too. Here an intervention is considered a set of acts, a process, a method, an approach, practical knowledge, a product or a prototype (demonstrator, simulation models, dashboards, software, (treatment) protocols, etc.), developed by the candidate to contribute to the issue that is central to the PD programme. Therefore, a work of art or creative product could also be the result of a PD programme, where it seeks the boundaries of possibilities within their own discipline and medium, where it develops innovative production strategies and work processes, and where it generates alternative forms of knowledge.

The business practice which UAS-PD aims at is characterised by its complex character, which various knowledge domains, business practices, interests (stakeholders), potential solutions and contextual characteristics are closely intertwined with in a complex balance of forces. It is a practice in which a monodisciplinary answer is inadequate in advance, and a multidisciplinary/interdisciplinary design approach needs to be taken. 'Practice' is a broad concept here, and refers to both broad social issues and to concrete work practices such as education or one's own artistic art- or design practice of creative people and artists. Interventions can have societal relevance, and at the same time, have an impact on a candidate's practical implementation.

The relevance of real-life issues is articulated both with and in business practice because articulating things is already an important aspect of the analysis perspective and hence, already directs options regarding interventions (intentionally or unintentionally). When an issue is chosen, what plays a part is that the issue should be related to (national and regional) knowledge and innovation agendas, so that the PD programme is also embedded in a broader research field, and the candidate could (and should) relate to it.

The interventions made in the PD programme conform to the context of practice and industry, not only with regard to type (action, change, process, product, work, etc.), but also focus of interventions, such as conceptualising, producing, implementing, scaling up or making sustainable. The interventions take place in and with business practice, and are meaningful to and useful for business practice. This also means that its effects will already be noticeable during the programme, which can be emphasised even more by taking a design approach as a candidate in which interventions are developed as semi-products, tried out and further developed. As a result, a PD programme also meets the need of industry for short-term results.

Characterising the PD programme as ‘learning to make interventions in complex business practices’ means that the candidate will at least have to substantiate:

- why interventions are necessary (*relevance*);
- where they are needed, e.g. on the basis of a ‘Theory of Change’ (*analysis*);
- how to intervene and establish the results (intervention approach and research methods);
- what change the intervention brings about in relation to the real-life issue (*clarifying things by a form of testing*);
- how insights and results can be shared and used in other contexts and hence, contribute to the body of knowledge (*validation and dissemination*).

Practice-based research plays a major part in learning to make interventions in complex business practices. The characteristics of practice-based research (HBO-raad, 2007) can also be applied to PD programmes:

Characterisation of UAS Professional Doctorate programmes

- 1 PD programmes are embedded in professional practice. Issues are inspired by professional practice (real-life situations). Subsequently, the candidate generates interventions (an action, a process, a method, an approach, practical knowledge, a product or a prototype) contributing to solving problems in professional practice and/or developing this professional practice.
 - 2 The issues a candidate works on are strategic questions and also aim at long-term solutions. The approach is multidisciplinary, interdisciplinary or transdisciplinary.
 - 3 PD programmes are designed within a range of organisational connections in which professorships, departments, programmes, industry partners and other external parties play a part.
 - 4 PD programmes are closely connected to the application context. This means that criteria from professional practice and industry play an important part when assessing quality.
 - 5 PD programmes are connected with the rest of higher professional education, as a result of which they can lead to renewal of the curriculum and professionalisation of staff.
 - 6 PD programmes yield new generic knowledge and insights already as early as during and after the programme, which will be passed on to various target groups via a wide range of channels.
 - 7 PD programmes are in line with what is adequate and relevant in the various sectors of professional practice.
-

3 Societal relevance and added value

The ambition is to develop PD programmes that have added value for society, industry and education, and hence are an addition to the existing PhD and PDEng programmes that universities offer. This added value was previously accounted for by universities of applied sciences (Amsterdam University of Applied Sciences et al., 2019; Vereniging Hogescholen, 2015). The added value as it is described below is based on consultation sessions with industry partners which the seven pilots held in 2020. An overview of the parties who warmly support the pilots and want to be engaged in them is shown in Appendix B.

Added value for society

The PD programme contributes to deepening and broadening practice-based research in higher professional education, and helps to meet the need felt in society for short-cycle innovation and directly applicable practical knowledge. A PD programme helps higher professional education contribute to a more sustainable, inclusive, justified, healthy and safe society. It also helps to meet the increasing need for 'inquisitive professionals': highly-skilled professionals who can tackle complex profession-oriented knowledge and design issues, and, in this way, contribute to sustainable innovation. With its profile, the PD programme meets the demand for education above master's level for those who mostly want to become proficient in practical innovation.

Examples: The multiple complexity of the *energy transition* and the transition of society towards a *circular economy* make the demand for a PD programme on this theme topical. The *maritime sector* is pre-eminently a sector in which academic and more practice-based research can and should strengthen each other, partly because there is a strong drive for making the shipping industry more sustainable and automating it to a high degree. The Netherlands is also facing enormous challenges to bring about an *inclusive and healthy society*. PD candidates and PD graduates contribute to the development of knowledge about a more integrated approach of health, care and well-being, and how to organise and finance it. There is a large demand from society for interdisciplinary collaboration with people with *design and creative skills*. To give an example, the complexity and dynamics within the *Leisure, Tourism & Hospitality* sector is increasing as a result of global connections with other sectors combined with sustainability issues, digitisation, area development and the COVID-19 impact. All this requires professionals who can look beyond disciplines.

'Solutions from a technical perspective are often available but the said complexity hinders us from introducing them to business practice. Solutions may result from practice-based research projects, probably more so than from fundamental research projects. To that purpose, the design-oriented and practice-based research of a PD is of essential value.'
(Quote from the industry of the Energy & Sustainable pilot, page i).

Added value for industry

The PD programme enables higher professional education to offer a continuous learning pathway of bachelor's, master's, and doctorate programmes with a professional/vocational orientation that meets the need for profession-oriented professionals. A PD programme with an internationally recognised degree offers a new career perspective to researchers as well as people working in professional practice.

Examples: For *Leisure, Tourism & Hospitality* a higher qualification level will be required in the future; a PD programme will meet this need. The job market in the *care sector* needs professionals who integrate technology and digitisation in their actions, and who can cooperate in multidisciplinary teams. The PD candidate is more closely connected with the industry, as a result of which there will be a bigger impact and a faster implementation. To be able as a *maritime sector* to respond to issues in the field of sustainability and safety, practice-based research, innovations and enough highly-skilled staff will be required. In the continuous learning pathway of the maritime sector there is currently a gap as far as highly-skilled practice-oriented inquisitive professionals are concerned. In the education sector, there is research knowledge available about learning and making changes, but in educational practice one does not know how to act accordingly. This sector needs a PD candidate who can work with available knowledge, and can change it into - what is termed - principled practical knowledge (Bereiter, 2014). Radically new ideas will be needed for making transitions. What they may be cannot be determined in advance. Therefore, it is important to use the creativity of those who are capable of thinking outside the box. *Creative thinkers and makers* can arrive at original and smart interventions that seduce and activate people, and lead to design-for-change (AWTI, 2020). To that purpose, designers and artists are needed who can work at an equivalent research level and level of intellectual ability as their colleagues who have a PhD in other domains.

'From the academic world we (Delft University of Technology) can present technological solutions, but without a thorough understanding of the daily practice in the sector it is not or hardly possible to make use of the full potency of these developments. Both the business sector and academics would benefit from typically practice-based PD research.'
(Quote from the industry of the Maritime pilot, page 9).

Added value for education and research

The PD programme contributes to the quality of higher professional education and research, and could increase the appeal of the universities of applied sciences to graduates from pre-university education and international students. Also, the PD programme meets the need for professionalising lecturers from universities of applied sciences and an offering of PD programmes within a university of applied sciences will increase the possibility that lecturers having a doctoral degree will be hired by encouraging a research culture. PD programmes may also strengthen research groups with lecturers/researchers who are able to work on practice-based research even better, and strengthen their ties with industry.

Therefore, PD candidates are always affiliated to research groups within the universities of applied sciences and/or individual professorships. PD programmes will be a valuable and necessary addition to the range of research projects of professorships and research groups. And when a PD programme is offered, this would help to strengthen the competitive position of the universities of applied sciences in European research collaborations. In domains which have no or just a partial academic counterpart as in Art and Maritime, the PD programme would be crucial to making the Dutch universities of applied sciences more attractive. Interested candidates often opt for practice-oriented education abroad now.

'In the Leisure, Tourism & Hospitality domain, universities of applied sciences cooperate closely with international universities other than Dutch ones because there are no sufficient academic counterparts in the Netherlands. Their international partners usually offer a full first, second, and third cycle.'

(Quote from the industry of the Leisure, Tourism & Hospitality pilot, page 28).

4 Level

European requirements

UAS PD programmes train students for a doctorate level (EQF 8) as stated in the Framework for Qualifications of the European Higher Education Area (QF-EHEA) – also known as Dublin Descriptors – and the European Qualifications Framework for lifelong learning (EQF). Both frameworks are compatible with each other (European Commission, 2008). An overview of requirements set to candidates at this level is given in Table 1. Every UAS-PD programme should demonstrate that the candidate who has completed it meets these requirements. This is further detailed out in chapter 6.

Table1: Overview of requirements set to the doctorate level

	Dublin Descriptors	EQF
	Qualifications that signify completion of the third cycle are awarded to students who:	
1	Have demonstrated a systematic understanding of a field of study and mastery of the skills and methods of research associated with that field;	Knowledge at the most advanced frontier of a field of work or study and at the interface between fields;
2	Have demonstrated the ability to conceive, design, implement and adapt a substantial process of research with scholarly integrity;	The most advanced and specialised skills and techniques, including synthesis and evaluation, required to solve critical problems in research and/or innovation and to extend and redefine existing knowledge or professional practice ;
3	Have made a contribution through original research that extends the frontier of knowledge by developing a substantial body of work, some of which merits national or international refereed publication;	Demonstrate substantial authority, innovation, autonomy, scholarly and professional integrity and sustained commitment to the development of new ideas or processes at the forefront of work or study contexts including research.
4	Are capable of critical analysis, evaluation and synthesis of new and complex ideas;	
5	Can communicate with their peers, the larger scholarly community and with society in general about their areas of expertise;	
6	Can be expected to be able to promote, within academic and professional contexts, technological, social or cultural advancement in a knowledge based society.	

Both QF-EHEA and EQF describe a high level of understanding, analysing, acting, creating and communicating, in which investigative skills play an important part. It appears from the way the term 'research' is used that it does not only concern being able to conduct research:

'The term is used in an inclusive way to accommodate the range of activities that support original and innovative work in the whole range of academic, professional and technological fields, including the humanities, and traditional, performing and other arts. It is not used in any limited or restricted sense, or relating solely to traditional 'scientific method'.'

(Bologna Working Group on Qualifications Frameworks, 2005, p.148).

So 'research' concerns both scientific research and other forms of innovation. This can be seen in the EQF that in Table 1 (point 2) does not only speak of 'research', but 'solving [...] problems in research and/or innovation'. EQF (points 1 and 3) also speaks of 'having made a contribution to existing knowledge or professional practice'. That this does not only mean scientific research is also confirmed by the European Committee in an explanatory note to the EQF, in which it is stated that the Dublin and EQF requirements stated in Table 1 (point 3) are 'fully integrated' (European Commission, 2008, p. 9).

The EQF offers room for two ways of implementing level 8: one in which it primarily concerns a contribution to 'study', 'research' and 'knowledge' as in the PhD (italicised elements in Table 1 highlighted blue) and one in which it primarily concerns a contribution to 'work', 'innovation' and 'professional practice' as in the UAS PD professional programme proposed here (the elements in Table 1 in bold and highlighted green).

Comparison with the master's programme

The level of the UAS PD can be further clarified by comparing it with the professional master standard (Vereniging Hogescholen, 2019) (see Table 2).

The main differences with the master level are the degree of independence and the degree of complexity of real-life issues. Furthermore, it is important to highlight that PD candidates are able to make a contribution to new ideas or knowledge with a broader validity than the case studied, whereas students doing a professional masters' programme mainly work on their own development and do not need to deliver any original transferable or generalisable contribution to practice.

Table 2: Comparison with the professional master standard

The professional master standard	The professional doctorate standard
Can apply current scientific insights to concrete issues	Can apply current scientific insights, practical knowledge and self-developed new insights to real-life issues
Has an eye for possible innovations on the basis of theory and practice-based research	Develops new, well-substantiated innovations in practice on the basis of theory and practice-based research
Can handle the complexity of issues	Can handle the varied complexity of issues, and develop interventions
Has options to act, research methods and theories to work towards solutions	Can contribute to the solution of a socially complex issue by developing – in practice – own interventions that can be used in several places and practically implementable
Can look across the boundaries of one's own discipline	Can use multidisciplinary working methods in a well-substantiated way
Contributes to the development of the profession and organisation	Contributes to the development and innovation of the profession and organisation by knowledge development, personal development, product development and/or system development
Developing as a person and as a professional	Developing as a person, as a professional and as an innovator
Profession-oriented and a direct link with practice	Profession-oriented for, in and with practice
Deepening and broadening	Deepening and innovative
Theoretical approach towards the professional practice	Taking a theoretical and practice-oriented approach towards the professional practice
Multidisciplinary approach	Multidisciplinary, interdisciplinary and transdisciplinary (together with partners working in practice)
Research as a component of the learning pathway	Research as a component of the learning pathway and innovation process

Comparison with the PDEng

Although UAS PD programmes have similarities with PDEng programmes of universities of technology, there are also differences (see Table 3). The PDEng is a two-year specialised technical designer programme with a degree of its own. This programme teaches engineers to design in a professional context. In UAS PD programmes practical professionals learn to make interventions in complex practices by doing practice-based research. What the PDEng

programme delivers is a specific new technical solution for products, processes and systems based on functional requirements and market demands as commissioned by a company. The practice-based research of a UAS PD programme aims to deliver generic practical knowledge, processes or products with a broader validity than the one of the case studied. This can be enacted by also doing research into the transferability of the intervention to other contexts through testing in several contexts. This would require more time, as a result of which the duration is three to four years. The PDEng has the structure of modular courses in year 1 and a one-year project at a company. The candidate attending a UAS PD works on a real-life issue right from the start, and the modular courses support this. When completing his/her studies, the PDEng candidate delivers a technological artefact which will be assessed by an assessment committee, who will look at product quality and the design process. In the UAS-PD, a broad set of exit qualifications are assessed to see whether a candidate has been able to make an intervention in a complex practice. To that purpose, the candidate collects a portfolio of evidence throughout the programme to be assessed by an assessment committee.

The UAS-PD is a professional programme which is also delivered outside the technical domain. Its starting point is the complexity and interdisciplinary elements of professional practice. Developing interventions in this complex professional practice and reflecting as regards the broader usage in professional practice contributes to the complexity and a longer duration (see chapter 6).

Naming and degrees

As far as naming the programme is concerned, the term professional doctorate (abbreviated to PD) has been opted for. This is in line with the profession-oriented character of the programme, and what's more, it is a logical continuation of naming master's programmes in the universities of applied sciences, which are already labelled 'professional master's programmes' – and so, it gives a good indication of its own continuous learning pathway with a professional/vocational orientation.

As far as degrees are concerned, the PD title written behind one's name has been opted for, just like for bachelor's programmes (e.g. BA) and master's programmes (e.g. MSc). The UAS PD now has a distinctive degree compared with current Dutch practice at universities (PhD, PDEng).

Table 3: Characteristics of UAS PD and PDEng

	UAS-PD	PDEng³
Characterisation	Professional programme preparing students to become inquisitive professionals learning to intervene in complex practices	Design programme preparing students to become engineers learning to design in a professional context
Proceeds	Creating generic new practical knowledge, processes and products for bringing about and validating interventions in complex issues	Creating specific new technical solutions for products, processes and systems based on functional requirements
Main way of learning	Learning-on-the-job as a result of the candidate working on a real-life issue and in doing so, learning to develop, test and, if possible, implement interventions	Learning as a result of the candidate converting requirements into specifications, developing a concept and validating and concretising it in relation to the specification
Role of modular courses	Supports learning on-the-job. Total of modular courses: 30-60 ECs	Are half the curriculum (60 ECs)
Admission requirements	relevant master's programme plus relevant experience in the complex professional practice concerned	Academic master's programme
Domain	Art + Creative, Energy & Sustainability, Health & Well-being, Maritime and Leisure, Tourism & Hospitality. Afterwards: the clusters Education and Technology & Digitisation	Technology
Method of assessment	Peer review of a portfolio of evidence by professors and stakeholders	Peer review of a final project leading to a technical design by an evaluation committee in which stakeholders and academics have a seat
Duration	3 to 4 years depending on prior knowledge, experience, full-time or part-time programme, and nature of the programme	2 years

³ Based on Diploma Supplement to Professional Doctorate in Engineering programmes (<https://www.4tu.nl/sai/en/education/pdeng-degree-supplement.pdf>) and Assessment Criteria (<https://www.4tu.nl/sai/en/education/assessment-criteria/>)

5 Programme profiles

The UAS PD is in line with the profession-oriented character of the universities of applied sciences. This means that UAS PD programmes prepare students for a specific programme profile. In the design phase, every PD programme will develop one or several programme profiles that answer the question: what sort of professional do we prepare our students to become? These programme profiles need to align closely with one's own professional practice, and they can adapt to social needs. The profiles are a concrete translation of the level standards given in chapter 4 set to a specific domain, and describe exit qualifications of the programme.

A programme profile has four important functions, which are detailed out in chapter 6:

- 1 It gives direction to the design of the programme as a result of the fact that it is the basis for candidate selection, practical assignment and course content of the modular courses;
- 2 It determines what types of performance candidates should deliver to demonstrate they meet exit qualifications;
- 3 It is the starting point for the assessment model which candidate performance is assessed with;
- 4 It offers the framework which professors are selected with who are given the right to supervise PD candidates.

The following issues are focus areas for designing this programme profile:

- **The proportion of practice result to knowledge result.** What considerations will be made as regards educating professionals who are able to make changes or innovations when facing complex issues, and educating professionals who are mainly able to make a contribution to the body of knowledge of the discipline when facing complex issues via practice-oriented research?;
- **The proportion of research to inquisitive activities.** What considerations will be made as regards using practice-based research as the primary means to work on a complex issue, and inquisitive activities as a means used in a broad practice repertoire of the PD candidate?;
- **The nature of multidisciplinary.** What scientific disciplines and professional domains will be considered for being a part of the programme and in what role?;
- **The nature and focus of interventions.** What is the nature of the interventions developed by the PD candidate (actions, process, product, work, etc.) and what are the PD candidate's activities aimed at (conceptualising, producing, implementing, scaling up or making more sustainable)?;
- **The relation between various forms of effects.** What is in the PD candidate's work the importance of:
 - developing new knowledge and insights (development of knowledge)
 - developing new products, services and solutions (product development)
 - having the parties involved learn (personal development)
 - helping to change habits and working methods

Examples of programme profiles that students can be trained for are those of the *practice-based researcher* who develops and validates practical knowledge by means of practice-based research in and with practice and those of the *practice improver & -innovator* who can take the lead at a strategic level in complex innovation processes and change processes, and can manage them well. For further details of these examples see Andriessen et al. (2020).

6 Structure

The PD programme will be offered by a Graduate Network of collaborating universities of applied sciences within a cluster (joint programme). There will be an option to collaborate with national and international universities in the Graduate Network. In the first instance, five clusters will be provided for in the pilot phase: 1) Art & Creative, 2) Energy & Sustainability, 3) Health & Well-being, 4) Maritime and 5) Leisure, Tourism & Hospitality. The clusters Education and Technology & Digitisation will join them as soon as possible (see appendix 2). Candidates learn the most while on the job, so while they are working on a complex issue from industry or society. This learning on-the-job will be supported by course modules that will be selected and/or offered by the Graduate Network. The size of these course modules will be detailed out per pilot. The individual PD programmes will be supervised at participating universities of applied sciences.

The seven clusters will spend the calendar year 2021 on concretely designing the PD programmes. In the programme design, attention will be paid to entry and exit qualifications, course content, examinations, supervising candidates, study load and duration and procedures. To that purpose, the following guidelines will apply:

Entry qualifications

For developing practice-based interventions, a thorough understanding of practice is required. Therefore, participants in the PD programme will need to have demonstrable practical experience and insights gained in practice apart from an officially recognised qualification (master's degree). Quality of this practical experience will be more important than duration. Practical experience may have been gained in various ways, including during a (part-time) study programme. The required practical experience can be tested in a criterium-oriented interview before the PD programme commences.

Exit qualifications

Every PD programme will draw up one or several programme profiles stating the exit qualifications of the programme. These programme profiles offer a concrete translation of the PD qualifications as stated in chapter 4.

Course content

The PD programme is a course which practice-based research is central to: research that focuses on making interventions in complex business practices. Candidates mostly learn during and through activities they carry out themselves, and only to a limited extent through the knowledge they are offered as instructions by teaching staff. The activities during which they are going to learn can only be determined in advance to a limited extent, and will strongly depend on the real-life issue the candidate is going to work on. Activities and their didactic value can be influenced though by creating the right circumstances. The pilots will need to design these circumstances when detailing out their proposal. This could be an assignment or question(s) and concrete tasks as input and modular courses for supporting knowledge.

Candidates will need to work on their issues in short cycles, so value will be added to business practice as early as during the track, and not only until the end of it. This type of education consists of tailor-made course modules that support the objectives of the PD programme and are in line with the candidate's previously acquired knowledge. It also involves the physical setting (e.g. one's own workplace) in which the learning process takes place, and artefacts, tools and other sources that support it. The pilots will also need to design a social setting, such as a team who work on the real-life issue, a structure of supervising candidates and a community of fellow students.

Supervision

The quality of supervision is crucial to the learning effect of learning on-the-job. Learning on-the-job does not only mean becoming more proficient, but also getting familiar with a professional community. The 'significant others' (supervisors) support candidates by being their role model, colleague and critical friend all at the same time. Candidates will be supervised by a supervisory committee, chaired by a professor having a degree at EQF level 8. He/She will act as supervisor. Day-to-day supervision can take place by the professor or a member of the research group holding a PD or PhD degree. Furthermore, two external professionals from practice will be members of the supervisory committee. They will be directly involved in the real-life issue, have a PhD or PD or an equivalent professional and intellectual ability and act as critical friend. Supervision will be intensive (some 30 to 40 person days per year for the entire team) and will commence right from the start of the PD programme.

Examinations

During their studies, PD candidates will collect evidence which they can demonstrate with that they meet the programme profile requirements. In the design phase, the pilots determine what performance they demand from their candidates, and what evidence needs to be collected.

This evidence will form a portfolio with four types of evidence:

- 1 insight into the process;
- 2 insight into personal and professional reflection on that process;
- 3 aptitude tests in line with the programme profile;
- 4 Insight into the quality and reliability of results.

Insight into the process can be given, for example by accounting for the research process, a logbook, a documentary, a narrative, etc. Insight can be given into the ability to reflect on the process by writing a reflection report, keeping field notes in which reflections can be included, having candidates give one or several (mid-term) presentations or defend their doctoral thesis. In line with the character of a professional programme in which learning mostly takes place *on the job*, 'demonstrating that you can do it' plays a major part in assessments. All sorts of products can be used as aptitude tests such as peer-reviewed journals or academic publications, reports, exhibitions, algorithms and other products that will be reviewed by a commission of peers. These aptitude tests need to align with exit qualifications stated in the programme profile.

The candidate will need to demonstrate soundness of the end result by substantiating:

- Why interventions are necessary (*relevance*);
- Where interventions are necessary, e.g. on the basis of a Theory of Change (*analysis*);
- How to intervene and determine results (*design approach and research methods*);

- What change the intervention brings along in relation to the real-life issue (*clarification*);
- How insights and results can be shared and used in other contexts (*validation and dissemination*).

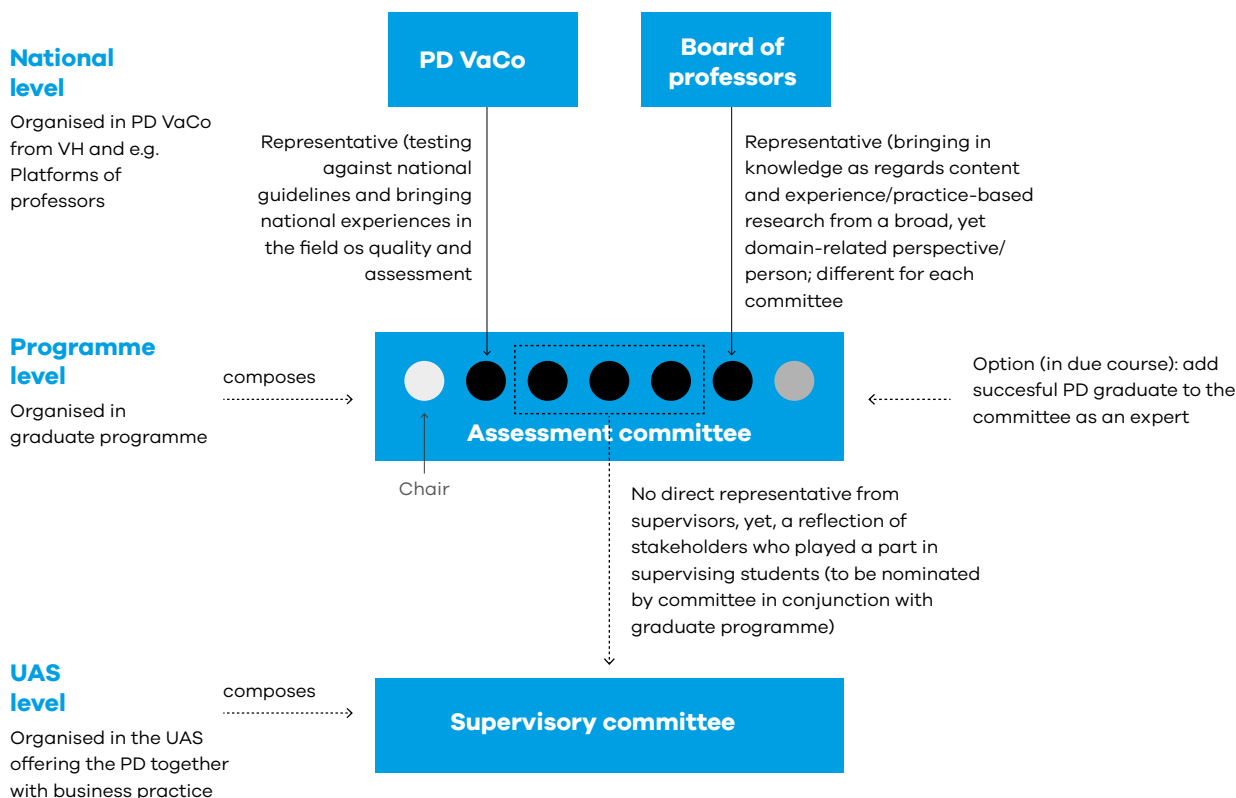
The evidence given by clients and other stakeholders will also play an important part as proof of soundness. Another assessment component is a criterium-oriented interview by the assessment committee testing the portfolio developed by the candidate. Every pilot formulates requirements set to the portfolio and develops an assessment model stating, among other things, the weight of the various forms of evidence.

For assessing and supervising PD programmes, a structure will be proposed which will be used during the four-year period of the pilots. On the basis of experiences gained in the pilots and also as a result of the growing number of PD candidates, this structure might have to be reviewed to keep it executable and efficient. Assessments will be taken care of by an assessment committee who will be compiled by the Graduate Network per PD programme. In the pilot phase, the committee consists of (see Figure 1):

- A member of the Professional Doctorate Validation Committee (PD VaCo) (see chapter 7) as chair;
- A member from the community of professors, to be chosen from a platform of professors related to the relevant cluster;
- Three members nominated by the supervisory committee who are a reflection of stakeholders in the supervisory committee; at any rate, a professor and professionals from the discipline and/or practice.

In due course, a PD graduate can be added as an expert. If norms have been established sufficiently, the member of the PD VaCo can be left out. Supervising and assessing candidates will be two different processes. Supervisors will not have a seat on the assessment committee. The supervising professor will have the right to make the final judgement as to whether the end result of the PD programme is of a sufficient quality and size to nominate the candidate to the assessment committee.

Figure 1: Structure of assessing and supervising candidates (pilot phase)



When the assessment committee are assessing candidates, they will be supported by an assessment model in which the programme profile is operationalised in criteria. When designing examinations, the *Graduation Protocol 2.0* (Andriessen, Sluijsmans, Snel, & Jacobs, 2017) could help out detailing out the programme profile, performances derived from it and the assessment model.

Study load and duration

A big part of the UAS-PD programme will be carried out in business practice. The candidate will mostly combine work and study, and complete a portfolio of evidence to demonstrate mastery of the exit qualifications. This will render a discussion about how many hours a candidate will spend on achieving his/her aim superfluous. Some candidates will be engaged in it full-time, while others might do other activities on top of it. This may differ per PD track and per expertise, and will also depend on the candidate's knowledge and abilities. The modular courses will be designed per pilot, and the number of credits may differ, but will be at least 30 ECTS credits per track. Furthermore, achieving level 8 needs time. Also, developing and validating interventions in complex situations requires a certain duration. The duration will differ per real-life issue and depend on the candidate's previous education and experience, and also whether it is part-time or full-time education. As a guideline, it can

be stated that the duration of the programme will be three years on the basis of full-time availability to four years when it is combined with other work, with a possible extension if there are delays. This duration will be further determined during the various pilots.

Procedures

A national PD protocol will be developed. It will detail out what the formal process of admission, supervision, assessment, awarding degrees and degree ceremony will be like.

Its ingredients will be:

- In advance: the Graduate Network assesses the candidate's entry qualifications and entry proposal. To that purpose, the university of applied sciences or the professor submits a proposal for the PD programme to the Graduate Network, which will assess its quality and look whether it fits the current research agendas;
- Start: the professor takes care of the candidate's intake at the start of the programme;
- 3 months: the supervisory committee assesses the candidate's PD plan;
- 9 months: go/no go decision by the Graduate Network;
- Supervision sessions with the day-to-day supervisor, and 6 times a year with the supervisory committee;
- Six-monthly feedback sessions with a panel of experts and professionals from industry organised by the Graduate Network;
- End: the professor nominates the candidate to the supervisory committee; the assessment committee holds a *peer review* of the portfolio and a criterium-oriented interview on the basis of the assessment model;
- The Graduate Network (a joint programme), who are represented by one of the participating universities of applied sciences, awards a diploma.

7 Quality assurance

National quality assurance

To ensure the national quality assurance for the UAS Professional Doctorate, a committee will be formed (similar to the CCTO for the Technological Designer programmes at the four universities of technology): the Professional Doctorate Validation Committee (PD VaCo) [working title].

PD programmes will be assessed with regard to quality, and certified by the PD VaCo. The following parties will have a seat on the PD VaCo: representatives of (regional) employers/industry partners (Higher Education Committee of VNO-NCW⁴/MKB Nederland⁵), representatives of the profession and representatives of knowledge institutes.

These programmes will be certified periodically on the basis of findings of validation committees established by the PD-VaCo. Validation committees are composed and installed by the PD VaCo. Participants in those validation committees are experts in the relevant themes coming from the business sector and the professional field of the relevant theme (e.g. care, arts or maritime) and higher education. One or several member(s) of the PD VaCo will be assigned to each validation committee.

At the start of a PD programme the PD VaCo will assess the programme with regard to the following points:

- Level: do exit qualifications as formulated in the programme profile fit EQF level 8 and needs and wants of the professional field?
- Programme: has the programme been designed in such a way that exit qualifications can be achieved by the candidate?
- Supervising lecturers: Do supervisors and lecturers possess sufficient expertise as regards content and didactic skills?
- Examinations: is candidate assessment valid, reliable and sufficiently independent?

A revalidation will take place every four years. One of the points considered is the quality achieved in the past four years on the basis of (a random sample of) portfolios of candidates. An important point for attention for the coming years will be joint norm finding. To facilitate this norm finding, the PD VaCo will provide every assessment committee with a committee member in the pilot phase at any rate. The PD VaCo also keeps a register listing all graduates of certified PD programmes. The VH will appoint members to the PD VaCo, nominate candidates to the PD VaCo for validation committees, provide secretarial services and, in this way, contribute to the quality of PD programmes. The PD VaCo will appoint the validation committees who will assess individual programmes periodically.

In the pilot phase, the PD programmes will work together to further professionalise quality assurance. To that purpose, the current programme team will be continued. They will work out experiences and lessons learnt. They will also have a look at tools to improve quality assurance, such as training courses for examiners, manuals, assessment forms and checklists. The learning process of PD candidates among themselves will be encouraged by forming a national UAS PD community.

4 'VNO-NCW' is the Dutch abbreviation of the Confederation of Netherlands Industry and Employers

5 'MKB Nederland' is the Dutch Federation of Small and Medium-Sized Enterprises

Quality assurance of the Graduate Network

In the pilot, the PD will be a joint programme that is delivered in a partnership of universities of applied sciences in a certain field. This partnership is called Graduate Network. It is led by the Graduate Committee (+ name of the cluster). The Graduate Committee is in charge of quality assurance of the PD programme, which contains at least the following components:

- The Graduate Committee draws up a programme profile for the PD programme;
- The Graduate Committee establishes a joint assessment model;
- The Graduate Committee decides on the content of modular courses and monitors their quality;
- The Graduate Committee draws up a multiannual PD plan with themes with regard to which candidates need to be recruited;
- The Graduate Committee selects the pool of professors authorised to supervise candidates as main supervisor and nominate them to the assessment committee. Candidates for the pool are assessed by means of the programme profile;
- The Graduate Committee assesses the PD plan and entry qualifications of intended candidates before a PD programme commences;
- The Graduate Committee composes the assessment committees on the nomination of the supervising professor, and monitors that these are a reflection of stakeholders of real-life issues addressed in the PD programme;
- The Graduate Committee organises benchmark sessions with professors from the supervisory pool periodically to improve joint norm finding. A member of the PD VaCo also attends these sessions. A manual is available for benchmarking (Andriessen, 2015);
- The Graduate Committee awards the degree, and in doing so, is represented by one of the participating universities of applied sciences.

After the pilot, these points will need to be evaluated. After the pilot, part of these tasks can be assigned to universities of applied sciences by forming a Board for Professional Doctorates. For each university of applied sciences, this board consists of two professors, a director/student counsellor of an academy/faculty, one member/professor from another university of applied sciences, one stakeholder from outside the university of applied sciences and the governor of the university of applied sciences in charge of research. The Board for Professional Doctorates ensures that national agreements are adhered to and have their effect within one's own institute, draws up additional rules and guidelines (the 'PD regulations') for PD programmes within the relevant university of applied sciences. PD regulations may not in any way be in violation of national agreements in this matter. The PD will then be allocated on the authority of the Board for Professional Doctorates, at the request of the PD candidate in question, on the proposal of the professor who will primarily supervise the PD programme, and after approval of and after adopting the distinction by the assessment committee. If there are any disputes about supervision or assessment, the Board for Professional Doctorates will act in the first instance as the body which a dispute can be submitted to.

Quality assurance per programme

In each PD programme, at least the following points will be assured with regard to quality:

- Supervisors are selected and appointed by the Graduate Committee, should meet quality criteria, and are a reflection of stakeholders;
- The PD plan and entry qualifications of the intended candidate are assessed by the Graduate Committee. Explicit agreements are being proposed in this plan concerning the intensity of supervision and the course modules to be attended;
- The PD programme has been divided into steps with a go/no go moment every year;
- Every six months, feedback is given by a panel of experts and professionals from the Graduate Network. Go/no go consequences could be attached to it;
- Assessment takes place on the basis of a portfolio of evidence to increase validity and reliability of the assessment. This portfolio is put up for a peer review, where relevant peers will assess it against an explicit programme profile and assessment model pertaining to it;
- The assessment committee is appointed by the Graduate Committee;
- The supervising professor has the ultimate authority to nominate the candidate for assessment or refrain from it;
- The degree is awarded by the Graduate Committee, represented in this matter by one of the participating universities of applied sciences.

Furthermore, the Dutch Code of Conduct on Academic Integrity applies to the candidate's research activities. The candidate will also make agreements with relevant stakeholders about property rights of deliverables and open access of results. Appendix A shows a schematic overview of the PD programme.

Comparison with quality assurance for PhD programmes

When the above proposal for quality assurance was drafted, quality assurance used by universities in PhD programmes was also considered well. There are similarities and differences because universities have years of experience with norm finding whereas the universities of applied sciences are just beginning, and should build in more explicit quality assurance. Validating PhD programmes is part of visitations of research. We think that certainly in the pilot phase, validation of PD programmes should be paid exclusive attention to, and for that reason, we would suggest forming the PD Validation Committees. An additional reason is that PD programmes not only concern practice-based research, but other competences play an important part in them as well. Also, the didactic component of the programmes should be paid extra attention to during visitations.

The position and tasks of the Graduate Committee can be compared with the ones of the Board for Promotions. However, in the pilot phase, numbers are too small to organise this committee at the level of universities of applied sciences. Two other reasons for a joint Graduate Committee per pilot are that it concerns a joint programme and that it is important to properly align with the character of the PD programme of the relevant professional field.

Since universities of applied sciences are about to start with norm finding, we would suggest making this assessment framework very explicit by drafting a programme profile and an assessment model per PD programme. We opt out of a national assessment framework because it is important this framework should fit the professional field and aim of the PD programme. Assessment frameworks, however, are validated by the PD VaCo. Alignment with the professional field will be further improved by ensuring that the supervisory committee and assessment committee are a reflection of stakeholders within the real-life issue. For that matter, they are the 'peers' for the work done by professionals. To increase validity and reliability of assessments, a choice was made to make use of more than one form of evidence and instead, work with portfolios. This is all the more important because PD programmes train students to become professionals having several competencies in addition to conducting practice-based research.

8 Finances

When finances in the context of the professional doctorate are being discussed, a number of aspects can be distinguished. On the one hand, there are various cost types, and on the other hand, possible financial arrangements. Furthermore, there is a difference between financing of/in the pilot phase and financing the phase after that (the 'steady state'). Finally, for determining suitable arrangements, a distinction should be made between the various target groups. All this is shown in Table 4.

Table 4: Costs - types of PD

	A Pilot-phase	B Phase after completion of the pilot
1 Reimbursing costs incurred by the universities of applied sciences involved for developing and offering a PD programme	A1 Estimating costs and suitable arrangement (e.g. upfront funding of development and implementation costs by the Ministry of OCW)	B1 Estimating costs and desired arrangement (e.g. amount partly based on number of programmes completed similar to bachelor's and master's programmes)
2 PD candidates reimbursed for time or lost income during the PD programme	A2 For estimating costs and making a suitable arrangement, distinguish between the various target groups of possible PD candidates: – working in the business sector; – working at a university of applied sciences; – student having completed a professional master's programme who wants to transfer to a PD.	B2 For estimating costs and making a suitable arrangement, distinguish between the various target groups of possible PD candidates: –working in the business sector; –working at a university of applied sciences; –student having completed a professional master's programme who wants to transfer to a PD.

In a separate plan, a thorough estimate of the costs will be made for the four cells above and – looking at the phase and the target group – it will be considered in consultation with the Ministry of OCW what will be suitable arrangements which the costs to be expected can be funded by. Of course, experiences with existing financing arrangements in universities of applied sciences or research universities can be drawn on. A first indication of costs is given below.

The starting point will be - as agreed in the position paper of the VH and VSNU as the fifth prerequisite - that funding these programmes will not go at the expense of existing education and research budgets of universities.

Costs

A distinction can be made between costs incurred for the development phase and costs incurred for the implementation phase.

Development phase

For the development of the UAS PD programmes in the coming year, costs will be incurred by a Programme Team and the pilots which are going to start. These costs are estimated as follows (see Table 5).

Table 5: Costs of development phase (x €1,000)

Components	2021
Programme Team	500
Pilot 1: Energy & Sustainability	400
Pilot 2: Health & Well-being	500
Pilot 3: Leisure, Tourism & Hospitality	500
Pilot 4: Maritime	300
Pilot 5: Art + Creative	500
Pilot 6: Education	400*
Pilot 7: Technology & Digitisation	400*
Total	3,500

* subject to the green light being given for the proposition; development costs for this pilot could also be incurred in 2022 if necessary.

Implementation phase

For the implementation of the PD programmes costs are incurred by the programme team, the PD VaCo, and the teaching staff involved in developing and executing the programme. Estimating these costs is hampered as a result of the fact that currently neither the exact number of candidates is known nor the exact details of implementing the degree programmes. Table 6 shows the preliminary estimate of candidate numbers per pilot in the seven domains.

Table 6: First estimate of candidate numbers

	2022	2023	2024	2025
Energy & Sustainability	5	5 + 5	5 + 5 + 5	5 + 5 + 5 + 5
Health & Well-being	5	5 + 6	5 + 6 + 7	5 + 6 + 7 + 8
Leisure, Tourism & Hospitality	3	3 + 4	3 + 4 + 5	3 + 4 + 5 + 5
Maritime	2	2 + 2	2 + 2 + 2	2 + 2 + 2 + 2
Art + Creative	6	6 + 6	6 + 6 + 6	6 + 6 + 6 + 6
Education*		5	5 + 5	5 + 5 + 5
Technology & Digitisation*		5	5 + 5	5 + 5 + 5
Total	21	54	89	125

* subject to the green light being given

In the first year, 21 candidates will start. In the second year, 33 new candidates will be added bringing the total to 54. In the third and fourth years, there will be 35 and 36 resp. new candidates bringing the total in the third year to 89 and in the fourth year to 125 PD candidates. If during these four years of the pilot the development appears successful, it should be possible that the proposed numbers are deviated from (e.g. in connection with sector agreements or adoption of mission-driven innovation policy and KIAs⁶)

NB: In the first instance, an intake of four cohorts will be provided for in this pilot from 2022 to 2025. Afterwards, the pilot as it will have been running until that date will be evaluated. However, in order to give PD candidates of the last cohort a chance to complete their programmes the pilot will actually be running until 2029.

Table 7 shows a first indication of implementation costs of the seven pilots. These are the costs incurred by universities of applied sciences for the PD VaCo, designing and delivering modular courses and supervising PD candidates.

Table 7: Costs of implementation phase

	2022	2023	2024	2025	2026	2027	2028	Totaal
Costs of implementation phase for universities of applied sciences (in €)	0.9M	1.6M	2.2M	2.8M	2.4M	1.9M	1.3M	13.5M
Number of candidates	21	54	89	125	104	71	36	
Costs per candidate/year (in €)	43K	30K	24K	22K	23K	27K	35K	

Wage costs

Wage costs of PD candidates will be a substantial part of costs and as a result, of the required financing. If it is assumed that PD candidates are placed in scale 11 of the cao hbo (or equivalent), wage costs (including employer's contributions) will be around €85,000 per candidate per year. Table 8 gives an overview of wage costs for the duration of the pilot divided over the years.

Table 8: Wage costs of PD candidates

	2022	2023	2024	2025	2026	2027	2028	Totaal
Wage costs of PD candidates (in €)	1.8M	4,6M	7.6M	9.7M	7.4M	4.5M	1.5M	37.2M
Number of candidates	21	54	89	125	104	71	36	

Total wage costs for 125 candidates – going beyond the duration of the pilot – with an average duration of 3.5 years will be €37.2m. In the design phase, it will eventually be considered together with the Ministry of Education, Culture and Science who is to pay (what part of) these costs: government, employer, candidate or any other parties.

6 'KIAs' stands for Knowledge and Innovation Agendas

Travel expenses and study costs

PD candidates also incur costs for attending courses, visiting conferences and buying the required literature or any other costs directly related to their research. The PhD scholarship for teachers makes a surcharge of max €3,350 per year available to cover these costs. As a first estimate of these costs for the pilots this seems to be a reasonable guideline. Multiplied by the number of candidates per year, this will produce the overview shown in Table 9.

Table 9: Travel expenses and study costs of PD candidates

	2022	2023	2024	2025	2026	2027	2028	Total
Travel expenses and study costs for PD candidates (in €)	70K	181K	298K	384K	293K	179K	60K	1.5M
Number of candidates	21	54	89	125	104	71	36	

The total of travel expenses and study costs during the pilot will be €1.5m.

Steady state

It is hoped and expected that universities of applied sciences can keep offering professional doctorates after a positive evaluation in 2026, and following cohorts of PD candidates can commence their studies. It is actually impossible to indicate the precise numbers of candidates at this stage, in which the first candidates still have to be recruited. If a cautious estimate has to be made as yet, the following assumptions are relevant:

- It is highly conceivable that PDs are going to be developed in a number of extra domains outside the said seven domains in due course;
- Some of the current domains have growth potential once the UAS PD has acquired a certain (international) reputation (among other things, Art + Creative and Health and Well-being);
- Since the UAS PD trains students for professional practice and can be used as a professionalisation tool for lecturers within universities of applied sciences, part of them will opt for a PD programme instead of a doctoral process.

Depending on how successful the pilot will be, it seems realistic that between 60 and 100 PD candidates will start their programme every year, i.e., between 210 and 350 PD candidates will be engaged in a PD track at any point in time.

Financing arrangements

Financing a new type of programme in Dutch higher education is complex because they have areas of overlap with existing programmes, but also deviate from them. Therefore, it would require a great deal of thinking through to arrive at the most suitable financing arrangement, mostly because we do not have a clear picture of the values regarding a number of factors determining costs. To that purpose, some assumptions or (political) choices will need to be made:

- Will it be a full-time or part-time programme? (and will there be a difference in financing arrangements, e.g. because part-time candidates are deemed to have a job?);
- What about wage costs of candidates? (Will PD candidates be employed by a university of applied sciences or do we change to a scholarship system? Is there no payment or a different type of payment?);
- Will the PD candidate pay tuition fees? If so, how much? (external doctoral students pay €10k - €15k per year for a PhD, but there are also many waivers);
- Shall we ask employers to pay a personal contribution? (are they willing to do so? It is customary to do so for PDEng, but what does it entail for PD candidates from outside universities of applied sciences versus within universities of applied sciences?);
- Will any schemes be offered by the SIA Taskforce for Applied Research, which facilitates e.g. appointments of PD candidates within RAAK projects (as offered by NWO; e.g. a scheme similar to the SIA HBO postdoc arrangement)?;
- Can universities of applied sciences in Europe make use of the Marie Curie programme within Horizon Europe in order to get PD candidates funded?

As stated above, it will be considered in a separate scheme in consultation with the Ministry of Education, Culture and Science what will be suitable arrangements which the costs to be expected can be funded by. Of course, experiences with existing financing arrangements in universities of applied sciences / research universities can be drawn on.

9 Design phase

Before the several pilots of PD programmes can be started, some design activities should be carried out at two levels: the national level and per pilot. At a national level, the following matters should be arranged at least:

- Designing and structuring a PD VaCo;
- Arranging financing;
- Arranging a legal basis;
- Communicating the proposition and recruitment clearly;
- Forming a PD community for candidates;
- Drawing up a PD regulation.

Per pilot the following matters should be arranged at least:

- Forming and structuring a Graduate Network and a Graduate Committee;
- Making a concrete design;
- Organisation and structure ;
- Recruitment.

As was indicated in the previous chapter, it is expected that four cohorts will start in the pilot. After the fourth year – if the first PD candidates have completed their programme and almost a hundred PD candidates are still engaged in it – a first evaluation of the pilots will take place. Although not all candidates will have completed their programme by then, quite a lot can be said at that stage about use, necessity, added value, quality and feasibility as far as PD plans, recruitment, funding, involvement of industry and process are concerned. This will be an internal evaluation by the VH at any rate, but it is very likely that an evaluation by the Ministry of OCW will also take place. The VH will evaluate things on the basis of at least the following criteria:

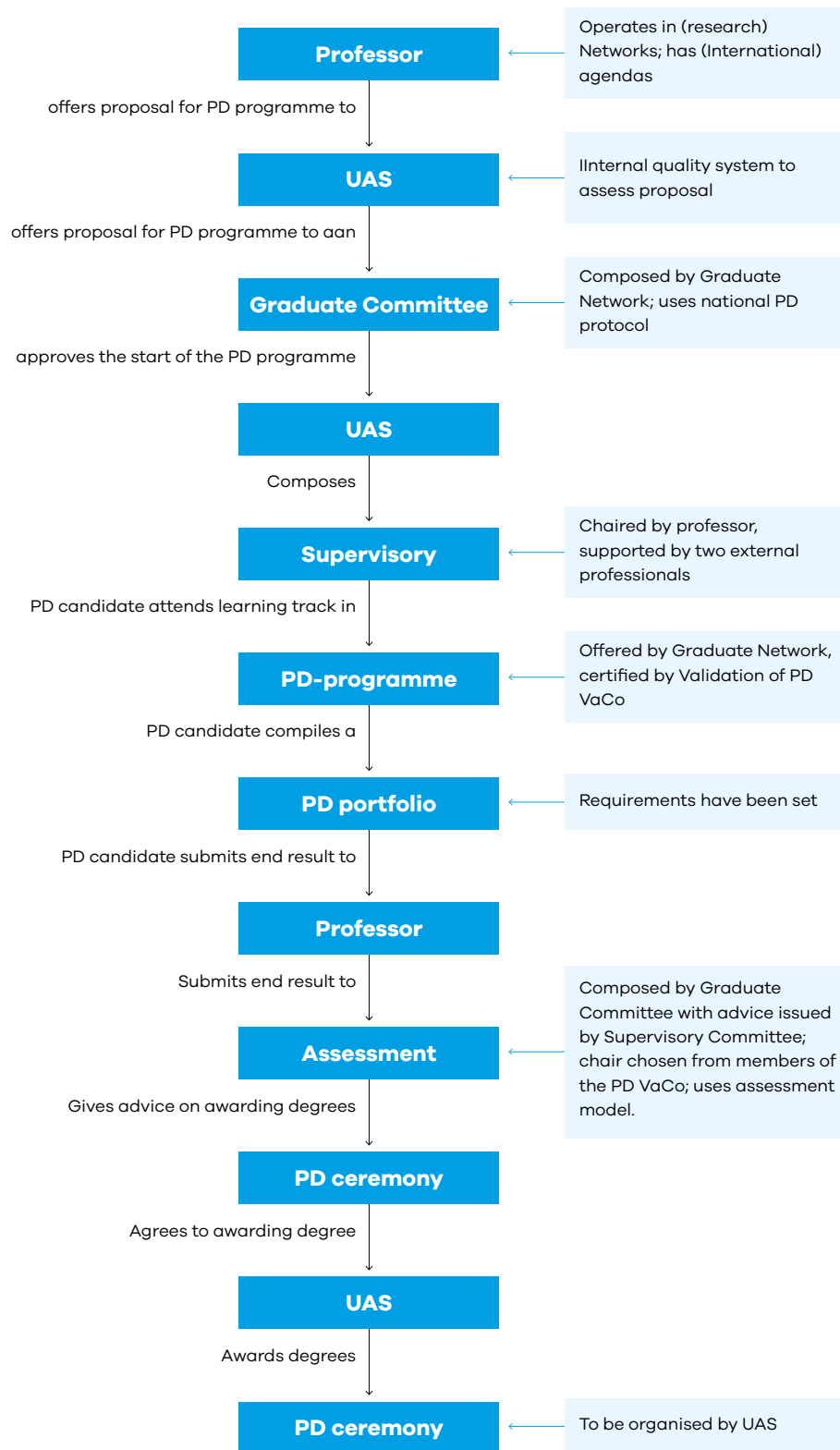
- With their profile, graduates meet the requirements set by the industry, and are added value;
- Portfolios show that their level is equivalent to EQF level 8;
- Directly involved stakeholders are satisfied with the results delivered;
- Candidates are satisfied with the structure and supervision of their PD programme;
- Research groups and the Graduate Network are satisfied with the contribution of programmes to the development of practice-based research;
- Developed procedures work properly.

The following elements from this proposal will be reconsidered at any rate:

- The volume of financing and funding when more is known about costs;
- The part played by the PD VaCo and its representatives in the assessment committees;
- Awarding degrees. Perhaps there will be room for a Board of Professional Doctorates at an institutional level;
- Requirements set to members of supervisory committees by business practice;
- Size and composition of assessment committees;
- Duration of programmes.

It is proposed to carry out a second evaluation some years after that, in which more fundamental matters regarding the significant impact and added value for the Dutch knowledge landscape of the UAS PD can be studied.

Appendix A Procedure of PD programme



Appendix B Statement of support for pilots

As indicated in the prerequisites for the third cycle in universities of applied sciences stated in the VH-VSNU position paper, the programmes within a third cycle of universities of applied sciences are a clear answer to (applied) demand from the business sector or society at large, for example for innovating professional practice or students who have completed this third cycle. The several pilots have been successful in garnering quite some support from various top sectors and industry organisations. The parties who warmly support these pilots and want to be engaged in them are listed below (per pilot):

Energy & Sustainability

The following parties have signed a statement of support and indicated they want to be engaged in the Energy & Sustainability PD pilot:

COGAS Gerald de Haan, general manager

Engie Bart-Jan Freriks, general manager

HoST Bio-energy installations Marcel te Braak, technical manager

Teachers Learning in Energy Jan Oosting, project leader

Groningen Seaports Cas König, CEO

TKI Nieuw Gas Topsector Energie Jörg Gigler, managing director

TKI Urban Energy Bouwe Meijer innovation analyst

Topsector Energie Marsha Wagner programme director Human Capital Agenda

Topsector Energie Mart van Bracht programme director of System Integration

Aalborg University, Denmark Han Brezet, professor of Innovation for Sustainability

Health & Well-being

The following parties have signed a statement of support and indicated they want to be engaged in the Health & Well-being PD pilot:

Top Sector Life Sciences & Health Carmen van Vilsteren, figurehead of LSH

TKI Holland Health Nico van Meeteren, Executive Director at TKI Bureau

Art + Creative

The following parties have signed a statement of support and indicated they want to be engaged in the Art+ Creative PD pilot:

CLICKNL (TKI) Bart Ahsmann, director

Topteam Creatieve Industrie Jann de Waal, figurehead of Topteam CI

BAK, basis voor actuele kunst Maria Hlavajova, general & artistic director

Belius Foundation, Berlin Andreas Kruger, managing partner

Club Solo, Breda Thomas Bakker, artistic leader

Design Museum Den Bosch Dr. Timo de Rijk, director

Fabrique Pieter Jongerius, partner/strategist

Municipality of Amsterdam Caroline Nevejan, chief science officer

Informaat Marcel Kosters, managing director business development

Jan van Eijck Academie Hicham Khalidi, director

Marineterrein Amsterdam Liesbeth Jansen, project director

Onomatopee Freek Lomme

Rijksmuseum Taco Dibbits, director

Stedelijk Museum Breda Dingeman Kuilman, director

STRP Ton van Gool, director

TETEM Wilja Jurg, director
The Patching Zone, Rotterdam Anne Nigten, director
Ubisoft Benoit Martinez, world director
V2_Lab for the Unstable Media Dr. Michel van Dartel, director
Valiz Pia Pol, director and publisher
Van Abbemuseum Nick Aikens, research curator
Waag Marleen Stikker, director and Lucas Evers, head of programme Make
Wageningen University & Research Prof. Dr. Hauke Smidt, personal professor
Willemtwoe, Den Bosch Henri Broeren, director/Executive Board

Leisure, Tourism & Hospitality

The following parties have signed a statement of support and indicated they want to be engaged in the Leisure, Tourism & Hospitality PD pilot:

Gastvrij Nederland (*partnership of ANVR, ANWB, CLC VECTA Centrum voor Live Communication, Club van Elf, FC Federatie van Werkgevers in de Cultuur, FEC-Nederland, HISWA-RECRON, Koninklijke Horeca Nederland, IDEA Independent Dutch Event Marketing Association, Koninklijk Nederlands Vervoer, NBTC Holland Marketing, Nederlandse Vereniging van Golfaccommodaties (NVG), Royal Schiphol Group, Vereniging van Evenementenmakers, Vereniging voor Kleine Reisorganisaties VvKR, Vereniging Vrije Theater Producenten VVTP and VVV Nederland*) Kees van Wijk, chair

NBTC Holland Marketing Jos Vranken, general manager

Koninklijk Horeca Nederland Dirk Beljaarts, general manager

ANVR Frank Oostdam, chairman/director

Schiphol Group Maaïke van der Windt, director of aviation marketing, cargo & customer experience

Kennisnetwerk Destinatie Nederland Kees van Wijk, director and Wendy Sieger-Kintzen, business development manager

Accor Erwin van der Graaf, vice-president

Bidfood Dick Slootweg, managing director

HMSHost International B.V. Walter Seib, CEO

Marriot International Michel Miserez, area vice-president

THE-ICE Craig Thompson, CEO

Maritime

The following parties have signed a statement of support and indicated they would like to be engaged in the Maritime PD pilot:

Rotterdam Mainport Institute Maarten van Ogtrop, dean

Delft University of Technology Hans Hopman, department chair of Maritime and Transport Technology

Amsterdam UAS André Henken, (acting) dean of the Faculty of Technology

STC Maritime & Logistics UAS Jan Bakker, director

Netherlands Defence Academy P. Oonincx, dean of the Faculty of Military Sciences

MARIN Bas Buchner, director

Vereniging van Waterbouwers Andrea Vollebregt, director

Nederlandse Visserbond U.A. J.K. Nooitgedagt, chair

Conoship International BV Geert Dokter, managing director

Holland America Line Sibrand Hassing, director of Fleet Operations Europe

Netherlands Maritime Technology E.M. Krikke, director of Innovation and Human Capital

International Association of Maritime Universities Takeshi Nakazawa, executive director

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