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**Paper**

**Title:** Introducing a Postgraduate Phase of Qualification at Universities of Applied Sciences: Collaboration and Quality in Doctoral Education

**Abstract**

Several EU Member States are implementing policies to develop the role of universities of applied sciences (UAS) in the training of early-stage researchers. The application-oriented research at UAS frequently draws on collaboration, not only between researchers with different disciplinary backgrounds but also with a wide range of regional, national, and international partners. Doctoral education takes place in this practice-oriented environment and often extends into multiple third mission areas. Doctoral education at UAS can be broadly divided into two policy approaches: First, UASs have a formal role in early-stage researchers' development including co-supervision with a degree-awarding university. Second, UASs become entitled to award doctorates independently. We aim to obtain a European perspective on the quality assurance discussion associated with this newfound role of UASs.

To examine how the policies in the four selected member states are put into practice, we address the following questions: What role is ascribed to UASs by the policymakers and what conceptualizations of the UASs 'applied' doctorate emerge? How do the requirements of collaboration fit into this? A thematically focussed case analysis of four member states' models (Austria, Finland, Germany, Portugal) aims to elucidate the underlying notions of the policymakers. The discussion of foundational conceptualizations outlines possible fields of investigation for a reflection on these developments against the backdrop of the European Higher Education Area.

**1. Introduction**

The lines separating traditional research institutions with doctorate-granting authority from Universities of Applied Sciences (UAS) without such powers are becoming increasingly blurred (Santos, 2024; de Weert, 2015). In many EU member states, UASs have gradually taken on more responsibility in the training of early-stage researchers in recent years, including the right to independently award doctorates in several countries. This shift is taking place in an application-oriented institutional biotope in which the ideal is collaboration, not only between researchers with different disciplinary backgrounds but also with a wide range of regional, national, and international partners. We aim to obtain a European perspective on selected quality assurance implications associated with this recently emerging role of UASs by way of an explorative case study approach.

In section two, we present brief, narratively structured case studies from four countries at different stages of development in relation to these new responsibilities of UASs. We focus on these institutions' role definition in each country's Higher Education System (HES), the conceptualization of the qualification contribution (the 'applied' doctorate) and how collaboration is spelled out. The foundational conceptualizations derived through the case interpretation enable a tentative exploration and brief discussion of the different approaches in section 3. We conclude with an outlook (section 4).

**2. Case studies**

The introduction of the UAS as a second-tier HEI in many EU member states has been driven by the need to tackle massification and labor market demands by expanding vocational and professional training, links with industry and mergers of vocational schools and colleges (Carvalho&Diogo, 2020, Lepori&Kyvik, 2010). The role of UASs (Ammattikorkeakoulu (AMK), 'Politécnico' (PPP), 'Fachhochschule' (FH), 'Hochschule für Angewandte Wissenschaften' (HAW), which we will all refer to as UAS) was focused on practice-oriented teaching. Over time, alignment with EU standards such as the Bologna process and the introduction of common degree structures added the Master's degree to the teaching portfolio, and research, development and innovation were added to their tasks (Cavallaro, 2024; Vossensteyn & de Weert, 2013).

Type of HEI	Austria		Finland		Germany		Portugal	
	University	UAS	University	UAS	University	UAS	University	UAS
UAS introduced in ...	-	1993	-	1991	-	1969-1972	-	1988
No. of students	280,000	65,000	167,000	173,000	1,730,000	1,160,000	110,000	65,000

Table: Time of introduction of UASs and 2023 student numbers by type of institution (Statista 2024a, b; HRK, 2023; Vipunen, 2023)

### Austria

The Austrian UAS sector has significantly reshaped the country's HE landscape, making it more diverse and aligned with international standards. Established in 1993, the FH sector was crucial in modernizing Austria's higher education, shifting from a centrally controlled model to a more flexible system, particularly in anticipation of EU membership (Pausits, 2016). This reform introduced a new tier of institutions focused on vocational training and applied research, complementing the traditional universities (Jungwirth, 2014), which emphasize research-led education. Austria was relatively late in establishing UASs compared to countries like Germany, where similar institutions existed since the 1960s (Hackl, 2013). Prior to this reform, vocational education in Austria was confined to secondary schools, with HE dominated by universities. The 1990s reforms aimed to diversify the educational landscape, better aligning it with labor market demands and expanding opportunities for students (Pausits 2016). The dual system developed during this modernization, with universities focusing on scientific and artistic research, while UASs emphasized practice-oriented education (Lassnigg, 2005). This model catered to diverse educational needs, enhancing graduates' employability through targeted, application-driven programs. In recent years, cooperation between universities and UASs has intensified, leading to initiatives that bridge basic and applied research.

One notable initiative is the doc.funds.connect program, launched in 2020 under the Austrian Science Fund, aimed at fostering collaboration between universities and UASs. This program supports cooperative doctoral programs that combine the theoretical training of universities with the practice-oriented expertise of UASs. Each institution contributes specialized knowledge, creating a well-rounded educational experience for doctoral students while strengthening research networks and regional cooperation. For universities, doc.funds.connect offers opportunities to expand research portfolios and connect with applied fields relevant to industry. For UASs, it supports academic staff development and solidifies their role in Austria's education system. Funded projects, with budgets of around 1 million Euros, involve shared supervision of doctoral candidates, who benefit from diverse academic environments. The doctoral degree is awarded by the participating university, ensuring academic rigor. The first programs under doc.funds.connect launched in 2021, and while a comprehensive evaluation is pending, early results indicate positive impacts on staff development, interdisciplinary research, and collaboration. A formal consultation is scheduled for 2025 to assess the initiative's effectiveness and explore areas for refinement.

This cooperative model highlights Austria's effort to create a more integrated and adaptive higher education system. While fostering collaboration between universities and UASs strengthens the system's competitiveness and relevance, challenges remain, including differing quality management systems and frameworks monitored by the Austrian Quality Assurance Agency (AQ Austria), potential supervisory imbalances, and varying institutional cultures and support services for doctoral students.

### Finland

Like Austria, Finland was also comparably late in establishing the UAS sector. The development stages of Finnish UASs can be divided into the trial period (1991-1996), the establishment and implementation phase (1997-2003), the development phase (2004-2013), and the start of the process of convergence of HEI from 2014 onwards (Rauhala et al, 2016; Friman, 2020). In addition to the legislative convergence of universities and UASs, Götze et al. (2021) have observed that a 'practice

drift' towards practice-oriented research can be observed at both, universities and UASs in Finland. The reasons behind this can be international collaboration, university rankings, the harmonizing effect of Bologna process and the importance of societal engagement in HEIs' mission (Santos 2024). The increasing research activities of UASs have made them converge on universities and doctoral education can now be seen as a compelling next step. Policy discussions on doctoral rights have recently started.

The UAS Act includes the need to base education on academic research and to the requirements of the world of work and its development. The R&D activities need to regenerate the industrial structure and to promote region's industry and business (Finlex 2020). UASs contribute to regions also by raising the level of qualification of the population (Santos 2024). In the 2000s, the continuous change in the operating environment has been reflected in UASs as networking, where working life actors are part of the planning, implementation and the structures of education. This networking links R&D to education. (Friman et al. 2022) According to Kajaste (2018) UASs are monitoring stakeholder satisfaction levels while the results and impact of the collaborative RDI activities is not easy to show. Finnish UASs's quality management systems are targeting more the volume of RDI activities due to performance-based funding scheme, and not the impact or quality of research. Changes to the quality system of UASs can be expected with the development of doctoral education, depending on the objectives set by the Ministry.

According to an unpublished survey on doctoral education at Finnish UASs, only 30% of UASs responded that they are willing to participate in doctoral education only if they get legal rights, while 70% are already planning to or implementing doctoral education. Over a third have been collaborating with European university alliances or similar in doctoral education and 90% answered their staff members have been supervisors of doctoral researchers. The research environment needs both early stage and senior researchers and the lack of the right to award doctorates has been seen as a barrier for recruiting highly qualified staff. This might slow down the progress to reach the Finnish objective of increasing R&D to 4 % of GDP if UASs can't contribute their best to the joint goal.

### Germany

Since its introduction between 1968 and 1972, the German UAS has been subject to role discussions (Gaidys, 2022). After being recognized as an academic HEI in 1976, it was not before the 1990s that the universities were required to open to UAS graduates (Wissenschaftsrat, 2002). Since the year 2000 and as a result from the Bologna reform, HE policy shifted away from formal degree differentiation and most federal states redefined the UASs' legal mandate. During this time many UASs changed their name from Fachhochschule (FH) to Hochschule für Angewandte Wissenschaften (HAW).

In 2009, the Wissenschaftsrat (WR) presented criteria as part of structured evaluations for conferring the right to award doctorates to private universities (Wissenschaftsrat, 2022b), fueling discussions about the UASs' eligibility. One year later, the Federal Constitutional Court confirmed the fundamental right to free academic activity for professors at UASs pointing out that there is no fundamental difference to university professors regarding this basic right (BVerfG, 2010). Since then, the federal states' parliaments have gradually implemented the possibility of UASs' independent right to award doctorates in HE laws. UAS Fulda became the first UAS authorized to award doctorates in 2016. In 2024, more than 2/3 of the federal states have created the legal possibility for the right to award doctorates for UASs.

The legal changes to the UASs mandate mean that research at UASs no longer is a sub-task that supports teaching, but stands alongside teaching, is no longer functionally linked to the educational mission and is not limited to application-oriented research (Haug & Pautsch, 2023). Institutional objectives were changed to original application-related research and development tasks. 'Academising' disciplines such as social work and nursing science, research fields that are not primarily covered by universities in Germany, are more likely to develop scientifically at UASs in the future (Weser, 2024). The WR observes that access to non-university collaboration and the "*routine in multi- and interdisciplinary cooperation*" is the domain of UAS while the universities' cooperative relationships tend to be more basic research-orientated (Wissenschaftsrat, 2023). In terms of



educational policy, a case is made against the creation of a UAS-specific (professional) degree and the drifting apart of different types of doctorates. Consequently, a differentiation in the sense of a more basic or *application-oriented research perspective*, but *within the same doctorate*, is advocated (Wissenschaftsrat, 2022a). However, UASs need to satisfy UAS-specific qualitative and quantitative criteria, such as critical mass, strong research track (competitive funding and publications) of the professors selected for awarding doctorates (Gille, 2023).

## Portugal

The Basic Law of the Educational System of 1986 (Law No. 46/86 of October 14) created two distinct subsystems: universities (PPUs) and polytechnics (PPPs). Since then, Portugal has experienced a significant transformation in its HES especially by developing the qualifications of the staff and research infrastructures of polytechnics. Important milestones in the path to doctoral education have been the 2009 decision to make it mandatory for polytechnic teachers to hold a PhD to access their career, reinforcing the complementarity between academic training and professional experience, and the 2018 law, that started the evaluations of R&D units of polytechnics by the Foundation for Science and Technology (FCT).

A legislative initiative from citizens resulted in the approval of Law No. 16/2023 of April 10, 2023. This law represented a historic milestone for polytechnics in Portugal, allowing them to confer PhD degrees in areas where their research units are rated "Very Good" or "Excellent". The legislation ensures that the PhD programmes offered by polytechnics follow the same accreditation processes with the Agency for Assessment and Accreditation of Higher Education (A3ES), recognition of degrees and the same quality criteria as those for universities. At the same time the Portuguese Assembly of the Republic approved the adoption of the designation "Polytechnic University" for polytechnic institutes, aligning names with their growing research capacity. To be successful in doctoral education, public investments and reinforcement of organizational capabilities at UASs are needed (Brás 2021, 10).

Before the right to confer PhD degrees, UASs participated in partnerships, networks, and multiple collaborations, which allowed:

- i. (co)supervision of PhD projects in university facilities and/or at the polytechnic HEI itself.
- ii. national and/or international collaboration, where polytechnic school members contributed to teaching the courses, even if the polytechnic HEI did not take part in the creation of the program;
- iii. national and/or international associations, where the polytechnic HEI participated in the creation and evaluation of the program alongside the accreditation agency (A3ES), although it did not confer the degree (e.g., PhD in Artistic Creation and PhD in Physiotherapy from P.Porto).

Following the right to confer doctoral degrees, these institutions gained the ability to act as sole or co-titular institutions of PhD programs. Currently, twelve PhD programs have already been accredited, four of which are at P.Porto, with several other proposals still under evaluation. The path laid out for polytechnics opens opportunities, with the potential to expand PhD programs, particularly in applied and technological fields. With the new legislation in force and the strengthening of research within polytechnics, Portugal is consolidating a more balanced and competitive HES, where universities and polytechnics collaborate and compete on equal footing in terms of research and advanced training at the highest level.

### 3. Explorative Discussion

The four case studies show similarities in terms of the development of UAS and their role in the HE landscapes. All four countries have reformed their HES in recent decades to strengthen the role of UAS and involve them more in research and, with the notable exception of Finland, in doctoral education. The reforms were partly motivated by the desire to adapt the national HES to European standards, particularly regarding the Bologna Process. The change in role attributions and the associated questions of permeability were and are a topic.

All four countries have, *at systemic level*, introduced UASs initially as an alternative to 'traditional' universities to diversify the HE landscapes and better meet labor market demands. This strengthening of the career orientation of HE provided by UAS is based on practice-orientation throughout. R&D has become increasingly important in recent years. Research at UAS is generally application-orientated and aims to find solutions to practical problems. Terminology varies, and semantically overlapping but not meaning-identical terms are used, such as 'practice-oriented', 'practice-based', 'applied', 'application-driven', 'application-related', 'application-oriented'. Despite having the same criteria for both types of HEIs, Portuguese UAS see the potential particularly in applied and technological fields. In Germany, for the sake of functional differentiation of the types of HEI, it is emphasised that UASs have expertise in application-oriented research and cooperation with partners. While Germany has developed specific criteria for UASs awarding doctorates, Portugal has levelled the field placing entirely in this regard. Austria has implemented the so-called joint doctorate programs between UASs and public universities.

*At institutional level*, UASs work closely with partners from the industry and other sectors to ensure the topicality and societal relevance of their research and teaching. At the same time, collaboration with universities can take the form of cooperation, co-supervision of doctoral students or participation in joint doctoral programs. In Austria, e.g., a public-private partnership model has been introduced for the funding of UAS, which enables the participation of companies and other organizations. In Finland UASs have started to collaborate in doctoral education with degree-awarding universities without formal authorization to educate doctoral researchers. UASs in Germany and Portugal have developed their own quality standards for doctoral training, while in Austria and Finland UASs follow the standards given by the public universities.

*At individual level* there is an increasing demand by UAS graduates to do a doctorate with career opportunities being improved, not only in R&D. PGR education at UASs promotes non-disciplinary research and collaboration, placing additional demands on both supervisors and doctoral candidates. The limited permeability of the HES for UAS postgraduates to enter third cycle qualification is an issue in all four countries. In a comparative survey (Academic Profession in the Knowledge-based Society, APIKS) data was gathered on the academic profession, including collaboration with doctoral students. In all four countries, between 30-40% of academics at universities of applied sciences (UASs) are involved with doctoral students (APIKS, 2024). This suggests that, regardless of national regulations and models of doctoral education, an average of one-third of academic staff is engaged in some form of doctoral education. In Finland, UASs see doctoral training as an important tool for the career development of their employees and a path for their Master's students. UAS doctorates open new possibilities for a diversified student body.

The discussion of the four cases illustrates a Europe-wide trend towards a mission shift of UASs, which are increasingly establishing themselves as important players in research and doctoral education. The granting of doctoral degrees to UAS in Germany and Portugal emphasize the diversification of these countries HES and provides new opportunities for UAS postgraduates. The quality assurance implications of these developments have not yet been analysed comparatively. Comparable quality standards have not been explicated by HE policymakers, nor has it been addressed whether the apparent diversity is desirable in terms of education policy. The disparate approaches have not been reflected in the context of a "bigger European picture" about educational policy suitability. Whether this diversity is welcome or indicates inconsistencies has not yet been researched.

#### 4. Concluding observations and outlook

Many UASs in Europe are in a phase of realigning their role identity and challenge the binary division of their national HES. We argue strongly in favor of taking a 'European' perspective on the PGR-related quality implications of the UAS's 'extended research function' (de Weert, 2015) to allow for peer learning. The four case studies show a trend towards a systemic role shift of UAS in Europe. UASs play an important role in research and increasingly so in doctoral training. The growing number of UAS with degree awarding powers underlines this development. The future of UAS will depend on how they deal with the tension between practice-orientated education in a collaborative setting and academic excellence, both internally and vis-à-vis other players in their respective HE ecosystem. It is

important that UASs retain their strength - the close integration of theory and practice - and at the same time use the opportunities offered by research and doctoral training. The role of 'traditional' universities in establishing the new role and responsibilities of the UASs – critical friend, partner, competitor, role model, evaluator, or something else entirely – is yet to be found. The European Higher Education Area faces a pivotal moment; it risks missing an opportunity for policy leadership that could bolster institutions supporting doctoral training. A more coherent European strategy could empower UASs to fully realize their potential as drivers of educational diversity and applied research excellence.

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