

Diversifying doctoral assessment to recognise diverse PhD trajectories in the Netherlands

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Training of independent researchers is a key aspect in fostering the ambition of the Netherlands in sustaining a knowledge economy (1). Over the past 25 years, the number of PhD candidates trained in Dutch Universities has more than doubled (2). Traditionally, the doctoral degree has been a pathway towards an academic career. During their degree, PhD candidates would be trained to become independent researchers under the supervision of more experienced scholars, with the aim to progress into an academic position at the university. However, both the goal and the structure of the doctoral degree and the academic system have changed considerably. Yet, the way that PhD trajectories are assessed have remained largely unchanged.

As we move towards understanding science as a team effort (3), we recognise the need for training academics that have different and complementary sets of skills. No researcher is expected to be a jack-of-all-trades but rather contributes to a collaborative effort in knowledge making. Doctoral candidates should be given the opportunity to develop competencies that would allow them to contribute from their specific point of expertise to a research team. Such competencies are also relevant for PhD candidates that find themselves working outside academia after concluding their degree, often in positions that require a diverse set of skills beyond research. This is particularly relevant since two thirds of PhD graduates end up working outside academia (2), yet only 13% of PhD candidates feel their doctoral trajectory prepared them for a non-academic position.

PhD candidates, whether they aspire to pursue an academic career or not, benefit from well-rounded doctoral training, with opportunities to develop competences beyond research-focused skills. Through engaging in their own research project, PhD candidates already develop a range of such skills, while others have been integrated into additional components of doctoral training programmes. For example, PhD candidates are encouraged to take courses on a range of transferable skills such as teaching, supervising students, assisting in project management, or engaging in outreach.

Yet, PhD researchers are still assessed exclusively through their research output where all other activities performed during the PhD trajectory are easily overlooked. In our most recent PhD survey about Recognition and Rewards in academia, we reported that most doctoral researchers would like their effort towards other activities beyond research to be considered in their final assessment (4). Research remains one of the main focuses of their degree, meaning PhD candidates often feel there is no room to develop transferable skills. They have to choose how to divide their time between their research and 'other tasks', given the time constraints for completing their degree, therefore neglecting their own professional development when it comes to skills not directly related to their thesis. These choices are often influenced by their responsibilities towards the institution and their supervising team.

Importantly, these responsibilities towards the institution vary according to the formal ties PhD candidates have with the institution.

Unique position of doctoral candidates

Doctoral candidates have a unique position in the Netherlands, where the doctoral training system allows for different statuses of PhD candidates. A doctorate can be funded through an employment contract, through a scholarship secured independently by the candidate, through self-funding, or through funding from an external source (such as a company or a governmental organization). In the latter three funding options, PhD candidates do not hold an employment contract with the university, (university) medical center, or research institute in which they conduct their research, but rather have a hosting agreement in place which may allow them access to certain facilities, as well as supervision and training (5).

The funding status of PhD candidates has direct ramifications on their PhD trajectory. The function profile (UFO) for positions based at the University states that the employed PhD candidate is expected to 'conduct and publish scientific research, based on the department's research plan' (6), among other duties. Alongside the responsibilities to conduct research, employed PhD candidates are expected to carry out teaching, supervision and other administrative activities that contribute to the overall mission of their institute. Contrastingly, PhD candidates that do not have an employment contract with the university would have more freedom in choosing the nature of their activities and would not be expected to (and possibly not allowed to) perform any activities that primarily fulfill the needs of the institution, such as teaching (4)

PhD assessment needs to change

Despite PhD candidates performing many tasks as part of their day-to-day work that do not directly contribute to their thesis, ultimately the doctoral degree is conferred based on the thesis that the PhD candidate produces. However, the thesis only assesses a subset of what research activities encompass in an era of collaborative, open, and responsible research (7). Performing replication studies, creating and maintaining research software, or collaborating with citizen scientists, for example, are all activities that could fall under the umbrella of (open and responsible) research, but if their outcomes cannot be reported in a publication these efforts can go unnoticed when a PhD candidate presents their achievements in the thesis.

We echo here the previously-raised concerns about the adequacy of PhD assessment in its current format (7,8), particularly in the light of the Recognition and Rewards (R&R) efforts to recognise a diversity of talents in research (3,9). Ultimately, using the thesis as the definitive format of assessment in a PhD degree communicates implicit expectations towards PhD candidates, that they should focus the majority of their efforts on completing their thesis in the time allocated for their doctoral degree. These implicit expectations can clash with the non-research related responsibilities that are directly and indirectly communicated by managers and institutions, particularly to employed PhDs. This tension between expectations and responsibilities results in increased work pressure and could be a contributing factor to

the poor mental health that is already well-documented in PhD researchers, resulting in longer doctoral trajectories that often extend beyond the duration of the standard PhD contract.

It is important to recognise that the PhD thesis was conceptualized when research was a mostly independent endeavor, where one would immerse themselves in one topic and produce one novel piece of research that would push the boundaries of their knowledge area. Yet, the way in which we understand and conduct research has changed considerably, and with that change came increased expectations in terms of ethics, data management, openness, and societal impact. Surely doing research and disseminating one's work will remain the main outcome of a PhD trajectory. However, we are convinced that the assessment of the PhD as it is now should be redefined.

Considering that the nature of doctoral research has changed and that the doctoral trajectory currently consists of more and broader research activities compared to the past, we question whether the thesis is still the appropriate format of assessment for PhD degrees. While we do not advocate for the abolishment of the PhD thesis as an assessment method completely, we believe its format and the expectations around the requirements for PhD completion should be flexibilized to reflect the diversity in PhD trajectories and training needs. Recognition and rewards should be embedded into the PhD assessment at the same rate as it is incorporated into other academic career paths, and whether that could mean creating additional ways of recognising and rewarding - both within and outside formal assessment - non-research activities or completely reform PhD assessment remains to be explored.

We believe that incorporating diversity in doctoral assessment will recognize, reward and encourage the diverse tasks that PhD candidates perform in their trajectory. Ensuring that such recognition is implemented through dialogue between all people involved in the shaping of the trajectory is paramount. The PhD candidate should be offered a clear description of their expected performance according to their choices jointly made between them and their supervisory committee. Moreover, we propose that such dialogue should be facilitated by institutional guidelines. These guidelines should provide examples of best practices to ensure assessment is as objective as possible, considering the different tasks that a PhD researcher can perform beyond engaging in their own research. Finally, these recognition and rewards mechanisms should be implemented in the PhD trajectory in a manner that all PhD candidates have the opportunity to shape their trajectory and be recognised for their different achievements, regardless of their funding status.

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