



## Research Assessment 2023 – Executive Summary



Department of Science Education

Faculty of Science

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## **Main Conclusions**

The Department of Science Education (IND) conducts interdisciplinary and practice-based research in various fields, including science and mathematics education, digital education, science communication, and history and philosophy of science. IND's research aims to enhance science practices, teaching, and learning through collaboration, teaching, and research-based consultancy. The department's research publications have a significant impact within disciplines and society – influencing educational policies and practices through collaborations, dissemination, and advisory roles.

In the 2023 research assessment, IND is recognized as an ambitious center of research, undergoing a transformative phase of expansion. Since the 2018 research assessment, IND has enhanced its research quality, extended its staff, and evolved into an internationally recognized research institution. This is a testament to IND's commitment to excellence in research and its influential role in shaping educational landscapes. The panel's overall assessment is that IND as a research institution is of a quality that is in some areas highly recognised internationally, and in other areas is internationally excellent in originality, significance, and rigour.

## **Factors that have Enhanced the Quality of Research**

The progress in the quality of research at IND can be attributed, in the first instance, to the active researchers at IND; and their efforts have, in turn, been supported by at least three strategic initiatives.

First, IND has undergone a significant transformation, marked by investments in growth and diversification. The recruitment of international staff has brought in new perspectives and methodologies, enhancing the department's research diversity and global impact. This strategic internationalization is reflected in the establishment of new groups and collaborations that have expanded the department's research scope and visibility on the global stage.

Second, the funding landscape for IND has evolved, with private foundations playing a pivotal role. This change has necessitated a shift towards more ambitious, collaborative research projects, driving the department to enhance its research capabilities and improve grant acquisition and management processes.

Third, IND's commitment to interdisciplinary and practice-based research has enabled diverse collaborations and impactful outcomes. The department's research is closely connected to practice, with

researchers working alongside science communicators, teachers, and practitioners, ensuring the relevance and applicability of their findings.

## **Critical Strong Suits of the Department**

IND's position as a leader in science education research is underpinned by its interdisciplinary and applied research, its integration of research into teaching and educational development, and the steadily increasing impact of its research.

The department's research is characterized by its breadth, covering a wide range of activities from basic research to applied research and consultancy. This interdisciplinary nature of research at IND not only enhances the quality but also the applicability of its work across various sectors.

Further, a key strength of IND is its effective integration of research with teaching and educational development. This is evident in the department's operation of educational programs and significant involvement in teaching philosophy of science courses, ensuring that research findings directly inform and enhance teaching practices.

Finally, IND's research publications have a significant impact, with a citation impact above the world average in its fields (FWCI 1.58) and on par with the average citation impact of the Faculties of Social Sciences and Humanities at UCPH. Additionally, the department actively engages in societal impact and policy development, demonstrating its commitment to not only advancing academic knowledge but also influencing societal and educational practices.

## **Three Foci for Future Development**

The department currently faces difficulties concerning the availability of external funds across its diverse research areas. This uneven availability of resources can impact the overall cohesiveness and productivity of the department. Care must be taken to avoid the construction of academic silos within the department.

As IND continues to grow, it is vital to maintain unit cohesiveness and support a balanced mix of activities and personnel within its diverse research groups. This involves regular monitoring of the size and composition of each research group to ensure they maintain a coherent research focus, are prepared to meet research challenges and funding opportunities, have adequate senior academic staff involvement, and offer opportunities for recruiting junior researchers as well as PhD and master's

students. Ensuring effective collaboration and synergy among these groups is crucial for the department to fully leverage its interdisciplinary strengths. This effort also extends to establishing a cross-departmental logic in organizing research groups and aligning teaching opportunities with all research areas.

Finally, IND is tasked with finding a balance between pursuing research excellence and meeting the needs of its stakeholders. As IND strives to increase its production of publications in top international journals, it is equally important for the department to persistently uphold its strong connections with practical applications.

## **Other Issues to be Emphasized**

IND's role in teaching and in-service training programs is central to its mission. There is a growing demand for IND's expertise in these areas, emphasizing the need for innovative pedagogical approaches and research-based instruction. Upholding IND's commitment to integrate its research in its teaching activities in this area is central to the continued success of the department.

The department is actively involved in public engagement through various initiatives, including outreach activities, science communication courses, and participation in policy development. These efforts are essential in influencing societal and educational practices. Further, IND engages with various non-governmental organizations and policy-making bodies, offering expert advice and contributing to the development of educational strategies and reforms. This engagement enhances the department's impact and relevance in a broader educational and societal context.

## **Conclusion and Plan for Action**

The panel concludes that IND holds a prominent position in its fields of research, backed by its strategic growth, innovative practices, and impactful research. However, to maintain and elevate this status, IND must act on a number of issues and pursue a number of opportunities. In the following, some actions are identified that will go in the direction of meeting the panel's recommendation. Needless to say, the actions formulated below are not a full picture of what IND intends to do regarding research in the next assessment period.

### **Diversify and Integrate Funding Sources and Research Initiatives**

IND will actively pursue a wider array of funding opportunities, both within Denmark and internationally, particularly focusing on EU funding and national government bodies. This approach aims not only to diversify the department's funding base but also to align it with IND's strategic research interests. The department will aim high, targeting prestigious funding sources and publication venues to elevate its research profile. When negotiating large-scale grants, special attention must be given to integrating these new projects within existing departmental activities, leveraging IND's existing expertise and preventing the creation of isolated, "siloed" projects within the department. The goal is to ensure that new initiatives not only bring in additional expertise but also reinforce and enrich IND's current research activities.

### **Strengthen Quantitative Research Expertise**

To elevate its status as an internationally leading science education research department, IND will increase the in-house expertise in quantitative research methods, aligning with the panel's recommendation and addressing a gap in IND's research capabilities. The introduction of robust in-house quantitative research capabilities is expected to enhance IND's international visibility and research output, enabling the department to conduct more comprehensive and generalizable studies in the field of science education.

### **Sustainable Workload Management and Support for Senior Staff**

In response to IND's growth and the panel's recommendations, it is essential to formulate and implement a sustainable workload management strategy to support senior staff. This strategy should focus on preventing the overburdening of senior staff with administrative tasks, mentoring responsibilities, and the supervision of new employees. One key aspect of this approach is to ensure an adequate number of senior staff members across all research areas, providing a balanced distribution of responsibilities. IND will, as the panel recommends, maintain its policy concerning balancing tasks between research and other tasks (teaching, administration etc.) according to the task and the situation rather than according to a grant. This action will facilitate more focused research time and support for staff, contributing to their well-being and the overall sustainability of the department's operations.

### **Comprehensive Analysis of IND's Research Organization**

IND will undertake a comprehensive reflection about its research organization to enhance coherence, responsiveness, and collaborative opportunities within research groups. This process should focus on regularly monitoring and optimally adjusting the size and composition of each research group to ensure they are well-aligned with their specific research focus. Each group should be structured to effectively

respond to research challenges and funding opportunities, with a balanced mix of senior academic staff and opportunities for recruiting junior researchers, PhD, and master's students. Additionally, IND will create a regular research group leader forum. This forum will serve as a platform for leaders to exchange support, share leadership experiences, and discuss strategies for research proposals and collaborations. It will also encourage the identification and pursuit of common projects that unite group members, thereby enhancing funding opportunities.

#### **Other actions relevant to the recommendations by the panel**

- To secure even more benefits from the collaboration between IND's consultancy section and research groups, it is vital to clearly define the integration's purpose and benefits. This means pinpointing objectives and how this synergy supports IND's broader goals like enhancing educational practices and influencing policy. Initiating regular interdisciplinary meetings and workshops will help in understanding the rationale behind this collaboration, promoting knowledge exchange between consultancy and research. Emphasizing joint projects from the start, where consultants and researchers work together, will ensure consultancy is informed by current research and vice versa, fostering a unified and goal-oriented approach within IND.
- IND will develop and implement a strategy to raise the visibility of the History and Philosophy of Science (HPS) section within appropriate disciplinary research communities.