Awti Advisory council for science, technology and innovation

SUMMARY

SHAKING-UP THE SYSTEM

TOWARDS A FUTURE-PROOF HIGHER EDUCATION AND RESEARCH SYSTEM

The Advisory council for science, technology and innovation (AWTI) advises the Dutch government and parliament on policy in the areas of scientific research, technological development and innovation. The AWTI provides advice when it is applied for or when the council deems it necessary. It enjoys an independent position towards the Ministers and their Departments, as well as towards other parties involved. The advisory council consists of a maximum of 10 members, each originating from different sectors of society, such as research institutes and trade and industry. The members do not represent any special interests.

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Shaking-up the system

Towards a future-proof higher education and research system

June 2019

Colophon

Photography	Bas Kijzers Fotografie
Design	2D3D Design
Printing	Quantes
	juni 2019
ISBN	978-90-77005-84-2

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The advisory report in brief

Global competition in higher education and research is growing. New developments impose ever-changing demands on workers and offer opportunities for a major shake-up of education and research. Student numbers have increased sharply and the system is becoming overloaded. Is the Dutch higher education and research system adequately prepared for the future? What do all these developments require of Dutch universities (*universiteiten*) and universities of applied sciences (*hogescholen*)?

At the request of the Dutch government, the Dutch Advisory Council for Science, Technology and Innovation (AWTI) examined these questions. In its report, 'Shaking up the system' *(Het stelsel op scherp gezet)*, the Council concludes that the Dutch higher education and research system in its present form is not future-proof, and makes a number of recommendations for improvements.

This publication is an abridged version of the full advisory report.

The Dutch higher education and research system is not future-proof

Dutch higher education and research are not future-proof. Although the system is still performing well compared to other countries, there are a number of key problem areas.

The **higher education** system needs to do more to ensure that students are in the right place within the system. There is a mismatch between choice of education programmes and the labour market. There is a shortage of graduates in sectors such as science and technology, but lack of capacity means that higher education institutions have difficulty accommodating the demand for such courses. At the same time, there is a surfeit of graduates in fields such as languages, culture, behavioural and social sciences, as a result of which a proportion of them fail to find work that matches their education level.

In addition, by no means all students end up in programmes that match their talents and ambitions. For example, almost all students from pre-university secondary education opt to go on to university, whereas some of them would be better suited to a more practice-oriented course of study ('higher professional education') at a university of applied sciences. Dropout rates are also high, with one in three students in both higher professional and university education giving up their studies during the first year (though some of them do transfer to a different programme), and not all students go on to obtain a degree. Transferring within higher education is also not always a smooth process, with all manner of practical obstacles impeding transfers from Bachelor's to Master's degree programmes or between universities of applied sciences and universities.

Dutch higher education is also insufficiently flexible and is therefore ill-prepared to meet future learning needs and opportunities. This is despite the growing demand for flexibility in education and training, partly with a view to facilitating lifelong development. This is a problem.

At present, a large part of Dutch **research** can be considered to be among the best in the world, but that position is under threat because of a lack of focus and pressure on research funding. In recent years, Dutch universities have broadened their research profile rather than making a strategic choice to concentrate more on their 'peak' areas. This limits the appeal of the Netherlands for top research talent, increasingly causing it to be seen as a 'transit country' for talent and unable to fully compete for genuine world-class researchers with countries such as the United States or Switzerland. The Netherlands is also less attractive for private investments in research and development: Dutch companies now spend more on (public) research and development abroad than foreign companies invest in public research in the Netherlands.

Dutch research could make a much stronger contribution to resolving societal challenges than it does at present. The third function of higher education institutions is **valorisation**; this currently receives less structural attention within these institutions than education and research. Moreover, knowledge partners in the Netherlands have not yet succeeded in bringing together sufficient capacity within long-term partnerships with stable funding and sufficient size and critical mass. This impedes their ability to tackle large, complex societal challenges effectively.

Present organisation and funding system act as an obstacle

The less than optimum performance of the system is a result of the way it is organised and funded. Higher education institutions are not making focused choices which are aligned with the future needs of society. The reason is that they are currently rewarded for exploiting as many funding sources as possible and for growing their market share in terms of student numbers. Higher education institutions are becoming increasingly similar as they each broaden their range of education and research activities. The present funding system does not reward them for the contribution they make to society or for making distinctive choices.

There is also insufficient coordination. While Dutch universities and universities of applied sciences have a great deal of autonomy, there is no clear framework or control structure at system level. Individual institutions are often focused primarily on their own activities and priorities and concern themselves too little with overarching societal interests. Competition for market share and research funding, differences in culture as well as different rules for universities and for universities of applied sciences make mutual

collaboration difficult, in turn rendering the functioning of the system as a whole both ineffectual and inefficient.

Universities and universities of applied sciences need to be guided more by the needs of society

In a system that is focused more on the needs of society, universities and universities of applied sciences will provide education which prepares students for the labour market of the future. Higher education is then able to adapt to the qualities and learning needs of students and to the demands placed by society on graduates. Simultaneously, such a system puts Dutch research in a better position on the international playing field and ensures greater impact on societal problems.

Recommendations

Revamped profile, collaboration and active supervision of the whole system

Achieving this requires a number of changes. In essence, universities and universities of applied sciences need to adopt a more distinctive profile and collaborate better, while the Education Minister takes more control to ensure that the system as a whole functions better. With this in mind, AWTI makes the following recommendations to the government.

1. Clarify the public mission of the system

The Minister of Education, Culture and Science should more emphatically embrace her responsibility for the higher education system as a whole. That begins with a clear statement of what is expected from the system and from higher education institutions: the Minister should periodically clarify the public mission of the system and of higher education institutions by formulating a single strategic framework for higher education, research and valorisation. Within that framework, the Minister should frame the public mission for the system in terms of system goals, ambitions and priorities. The ambitions should then be translated into specific, tangible objectives, for example the proportion of students who after graduation find work at a level and in a sector that matches their training, or achieving a position in the global top five for research in a specific field.

Such a strategic framework would give direction to universities and universities of applied sciences, making clear what is expected from the system in terms of higher education, research and knowledge dissemination, and what this means for institutions of higher education.

The public mission of higher education institutions encompasses 3 functions: education, research and dissemination of knowledge for the benefit of society:

- **Higher education:**
  - Graduates are well prepared for the labour market of the future, i.e. the range of study programmes on offer is a good match for the needs of the future labour market.
  - Higher education is readily accessible for all students with the ambition and ability; the education programmes on offer are able to accommodate different types of student and offer flexible transfer opportunities.
  - Higher education contributes to the ability of students to interpret, apply and communicate new knowledge and skills in an independent, analytical and critical way.
  - Higher education provides an ambitious study culture which fosters increased study success.
  - Workers are sustainably and flexibly employable: higher education offers flexible, demand-led programmes specifically tailored for those in work.
- **Research:**
  - Research contributes to the development of knowledge, expertise and skills in the teaching programmes.
  - Research pushes boundaries.
  - Research contributes to the development of new applications and solutions for social and economic issues.
  - The broad disciplinary knowledge base in the Netherlands is of high quality and, in specific fields, the researchers are world-class.
  - Dutch research attracts talented researchers from within and beyond the Netherlands.
  - Higher education institutes pool expertise and competences, including with other knowledge partners, in order to create impactful knowledge hubs.
  - Research extends across scientific disciplines.
- **Dissemination and utilisation of knowledge:**
  - The world of research is keyed into society: it engages in dialogue with society, involves society and shares new knowledge in an open, transparent and accessible way.
  - Research feeds the public debate with new knowledge.
  - Research actively shares new knowledge with SMEs and other businesses and civil-society organisations to enable them to make optimum use of that knowledge.

2. Monitor the system goals and steer towards stronger profiles and results

In a situation where higher education institutions are able to make their own distinctive choices about how they contribute to national ambitions and priorities, it is of particular importance that the Minister actively oversees how the system as a whole is performing and how universities and universities of applied sciences are contributing to this. What is the cumulative result of the performance of individual institutions viewed across the system as a whole? Does the quality of research and education match the level of ambition? Is the bar for the quality of research being consistently raised? Is the system as a whole sufficiently accessible? Is it delivering a good mix of graduates for the labour market?

This oversight can take the form of a 'governance cycle' in which higher education institutions first opt for a clear profile and lay this down in binding institutional plans, in which they also set out the agreements they make with other institutions on structural collaboration and how they plan to distribute or concentrate tasks efficiently. The Minister is responsible for:

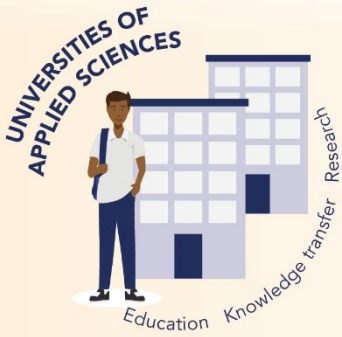
- testing whether the joint plans are meeting the public mission of the system and the specific ambitions from the strategic framework;
- monitoring the performance of individual institutions and the system as a whole using measurable indicators;
- engaging in a strategic dialogue with higher education institutions; and
- periodically evaluating higher education institutions.

This evaluation will affect the funding in the subsequent period. At the start of each new period, higher education institutions will draw up new institutional plans.

The Minister can also exercise influence by encouraging new developments and thereby mobilising the system. That will be appropriate if the system itself is not adequately generating the envisaged developments. The Minister can ask universities and universities of applied sciences to coordinate their activities with each other more effectively in order to resolve undesirable overlaps, unutilised opportunities or gaps. She can also deploy additional resources, instruments and experiments, for example by more actively promoting mutual collaboration between institutions.

With an effective and efficient governance cycle, the system can focus permanently on the public mission. This will give rise to a varied, flexible and future-proof system for higher education, research and valorisation.

Shaking up the system.
Towards a future-proof higher education and research system



RECOMMENDATIONS

Clarify the public mission of the system in a single **strategic framework** with clear system goals and priorities

Exercise **active oversight** by monitoring the system goals and steering towards clear profiles for higher education institutions and results

Ensure that higher education institutions adopt stronger **profiles** which are laid down in **binding institutional plans**

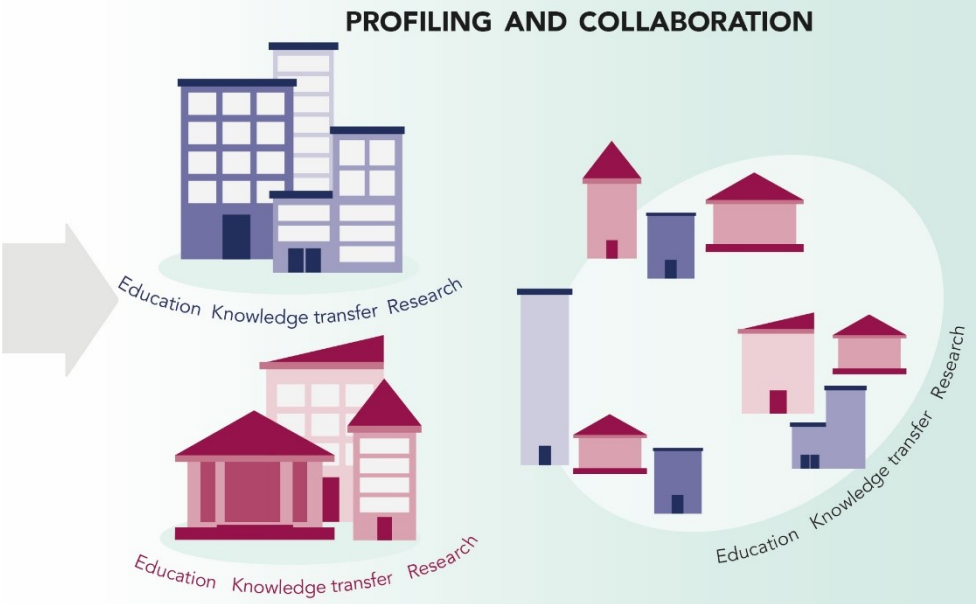
Offer higher education institutions **more tools** to achieve their chosen profiles by increasing the scope for **selection of students** and introducing **profile funding**

Promote structural **collaboration** between higher education institutions

SYSTEM NOT FUTURE-PROOF

- Mismatch between education and labour market
- Inadequately prepared for future learning needs
- Global competition in education and research
- Grand societal challenges demand knowledge and innovation

The Dutch higher education and research system performs well compared to other countries, but is insufficiently prepared for the future. Dutch universities and universities of applied sciences need to be guided more by the needs of society.



FUTURE-PROOF SYSTEM

- Students well prepared for the labour market
- Education well adapted to needs of society and to capacities and learning needs of students
- Education and research better positioned on the international playing field
- Greater impact on societal challenges

3. Consider entrusting system oversight to a dedicated body

The Minister could decide to have the governance tasks carried out by the Ministry. Alternatively, the carrying-out of these tasks could be entrusted to a dedicated body, for example a 'system authority'. The brief and terms of reference for this body would need to be clearly defined and the law and the strategic framework would have to set a clear direction. This would create a buffer between politics and the autonomous institutions in the system, and would also make it easier to maintain a focus on the longer term. Moreover, the composition of this body enables to ensure a broader embedding in the social context. Examples from abroad could be used as a guide in the precise design of such a body.

System governance in Ireland and Switzerland as an example

In **Ireland**, the Higher Education Authority (HEA) is the central regulatory body responsible for ensuring that the system and the institutions within it are meeting the expectations for higher education and research. The HEA has developed a framework (System Performance Framework) setting out the system goals and objectives. The HEA enters into a performance contract ('compact') with each education establishment, setting out the mission, objectives and priorities for that institution. The agreed performance targets are monitored and assessed, and the HEA sets the funding based on performance. The HEA has signed a Service Level Agreement with the education ministry recording the tasks, objectives and responsibilities of the HEA.

In **Switzerland**, the *Schweizerische Hochschulkonferenz* is the body with ultimate responsibility for higher education. It coordinates the activities of the Confederation and the Cantons, takes decisions on coordination and task distribution between higher education institutions, sets priorities and takes measures intended to promote the system goals. It is chaired by the Confederation and consists of representatives of the Cantons and advisory members representing the stakeholders. One of these advisory members is the chair of the *Rektorenkonferenz*, consisting of rectors of universities and universities of applied sciences and responsible for coordinating the collaboration between them. Higher education institutions adopt multi-year development and funding plans, including multi-year targets and focus points.

4. Ensure that higher education institutions strengthen their profile

Universities and universities of applied sciences must choose a clear profile in terms of higher education, research and knowledge transfer. They must clarify what their contribution is to the system goals: what do they stand for, what are their strengths and development areas, which are their target groups and what are their practical ambitions? They must also liaise with each other to coordinate their profiles and plans at sector level in order to achieve a joined-up strategic task distribution, specialisation and concentration of supply in research and education. Institutions would then lay down their profile, including the practical ambitions and coordination, in binding institutional plans, formulated in open and active dialogue with stakeholders.

A clear profile makes a university or university of applied sciences more recognisable and injects greater variety in the system. With a wide palette of higher education and research institutions, the system would be better able to meet the expectations of society, which needs a variety of different and recognisable manifestations of higher education and research (from abstract and academic to more practical in nature), at different levels, in different disciplines and for different sectors or target groups. More clearly defined profiles and greater variety in the system will ensure a better match between the supply of education and research on the one hand and the expectations of society on the other. In combination with clear agreements on collaboration, this would counter the unnecessary competition between higher education institutions, fragmentation of resources and duplication of activities.

Make way for different profiles and strong ambitions

Higher education institutions choose a profile, within which they establish a clear link with system ambitions and priorities from the strategic framework. Within this framework, they can build on their own origins and development. For example, one institution might have a strong tradition of collaborating with the business community, while another has traditionally devoted a larger share of its endeavours to teaching. In their profiles, they make clear choices on different dimensions, such as:

- Target groups.
- Orientation of the programmes (academic, vocational/practical).
- Differentiation in teaching programmes based on target group, teaching methods, level and breadth.
- Collaboration with other institutions at national, regional and international level.
- A focus on lifelong development.
- Ambitions in relation to digitalisation of teaching.
- Specialisations and specific focuses in research and education.

- Type and intensity of research.
- Ambitions in relation to dissemination and utilisation of knowledge as well as impact on society.
- Involvement of the industry and relevant professional community.

Making distinctive choices on these dimensions will give rise to different profiles. Where possible, institutions should dare to set the bar high; this would incentivise them to constantly raise their performance, in turn enabling them to grow within the fields of their profile ambitions, for example aiming for excellence in research in specific focus areas, in vocational education in close collaboration with professional practice, or in a flexible offer geared to lifelong development.

5. Give higher education institutes the tools they need to realise their profile

If they are to adopt a clear profile, universities and universities of applied sciences must be equipped to do so. They need to be given more tools to realise their profiles by broadening the scope for student selection and by linking part of their funding to the achievement of their chosen profile.

a) Expand the scope for selection

If universities and universities of applied sciences have more scope for selection of students at the point of intake, they will be in a better position to steer the student intake in a way that enables them to achieve their envisaged profile. As students' choice of study programme affects the deployment of research capacity, better control and steering of the student intake will enable higher education institutions to meet the demand for specific subject areas and disciplines more effectively. Combined with capacity control, selection will also make it easier to control the number of graduates in disciplines for which there is high – or low – demand from the labour market. Selection may also help universities and universities of applied sciences to achieve a better match between students and study programmes and therefore increase their chances of successful study.

The accessibility of the system is still of paramount importance: students must be able to find a place within the system that matches their talents and ambitions. Universities and universities of applied sciences have a joint responsibility here and therefore need to coordinate their strategic choices about selection at sector level. This requires mutual coordination and collaboration to ensure the smoothest possible (re)orientation of students towards their choice of study, for example by jointly offering them complementary education programmes.

b) Introduce profile funding

The funding must enable the system to achieve the system ambitions and support the profiling of the individual higher education institutions. The method of funding must match the profile chosen by the institutions. A proportion (between 5% and 30%) of the funding of universities and universities of applied sciences from the direct state funding (the so-called first flow of funds) therefore needs to be linked to the achievement of the profile and ambitions set out in the institutional plan.

Higher education institutions choose their own profile, complete with ambitions and objectives, and indicate the measurable results on which they should be assessed, using simple, relevant and robust indicators and clear benchmarks. There is scope in the assessment for qualitative evaluation of the results and the context in which they have been achieved. If an institution scores above the criterion, it is entitled to a bonus.

Profile funding is an effective means of setting in motion changes, and has two clear benefits. First, it supports the profiling of higher education institutions by rewarding them for achieving their selected profile. Second, it encourages them to focus more on the realisation of the outcomes which form the contribution to their social mission.

6. Promote collaboration between higher education institutions

Universities and universities of applied sciences need to pool their strengths in structural alliances. Acting together will enable them to meet the expectations of society more effectively. There is already some collaboration in the higher education sector, in both research and teaching, but is generally limited to collaboration among universities of applied sciences or among universities, rarely crossing the two sectors. The government is fully committed to encouraging and facilitating research collaboration between universities, universities of applied sciences and both the business community and civil-society organisations. Despite this, this collaboration is rarely deep, structural and long-term. As a result, the full potential of pooling the strengths of different higher education institutions, with each institution's contribution building on its own profile and its own strengths, is not achieved. Clearly defined profiles of individual institutes both demand and facilitate complementary collaboration.

Given the relative lack of deep collaboration between different types of higher education institution, it is up to the Minister of Education, Culture and Science to initiate the desired developments. The Minister could explicitly invite universities and universities of applied sciences to engage in structural partnerships, and could ensure that funding is available for this over an extended period, going beyond individual government terms. This could be readily linked to the governance cycle as described in Recommendation 2.

Universities and universities of applied sciences should include these partnerships in the description of their profiles in their institutional plans. They should also make clear what form of collaboration they envisage with international partners. They should engage in collaboration that spans several years and is clearly recognisable for the outside world. The partnerships could focus on education, top research or mission-driven research and innovation.

Universities and universities of applied sciences could organise a complementary range of Bachelor's and Master's teaching programmes in **educational networks**, with different orientations and targeting different groups. They would offer opportunities for reorientation and switching programmes, thereby improving the transfer opportunities. This would speed up the process of ensuring that students end up in the right place.

Strong research groups from universities and scientific institutes could join forces in **top-class research alliances** based around specific research fields, technology areas and themes in order to jointly secure a place among the world's best research practitioners. Such alliances would enable Dutch research to develop clear leadership in top-class research at global level. This in turn would attract top talent and private investments in research and development.

Universities and universities of applied sciences could work together with other public knowledge organisations, companies and civil-society organisations in **mission-driven consortia** to enable societal challenges to be addressed effectively. Complex societal issues require intensive collaboration throughout the chain from research through to practice in order to bring together the necessary knowledge and expertise.

Examples of pooled resources in structural partnerships

Energy Academy is a partnership between the University of Groningen, Hanze University of Applied Sciences, Energy College and the Energy Delta Institute. The Academy provides teaching based around the theme of energy transition at senior secondary vocational, higher professional and university level, offering programmes at Bachelor's and Master's level as well as a postgraduate MBA programme. It also offers online teaching modules, a PhD summer school and a range of other teaching programmes. The partners also collaborate on interdisciplinary research and innovation, for example providing facilities in which students, researchers and businesses can work together to test and develop energy innovations, and where start-up businesses are given a helping hand.

The **Flemish Institute for Biotechnology** (VIB) is one of four strategic research centres in Flanders, Belgium. The ambition of these centres is to excel in scientific research and knowledge transfer. They receive long-term grant funding for this which they use to fund strategic fundamental research. VIB carries out research on the functioning of the human body, on plants and on microorganisms. The emphasis is on translating fundamental research into practical applications for medicine and agriculture. Valorisation is an emphatic part of VIB's mission. VIB operates as a virtual research institute, with 1,470 researchers working in 75 university research groups at the five Flemish partner universities. As well as the researchers themselves, the research facilities are also based at the universities. VIB has a framework agreement with the universities, under which the proceeds from publications and intellectual property rights are shared. The participating research groups are evaluated based on performance indicators, collaboration and international benchmarks. A performance that is not up to scratch leads to removal from the VIB network. VIB enters into a new agreement every five years with the Flemish government and the universities, stipulating what the annual contribution will be from the government and setting the key targets for VIB. Good results in the five-year evaluation and adjustment of the VIB targets may lead to additional contributions from the Flemish government.

Advanced Research Center Chemical Building Blocks Consortium (ARC CBBC) is a national public-private consortium which performs research on sustainable chemical building blocks for energy carriers, coatings and materials. Researchers from three universities work closely with researchers from three multinationals: AkzoNobel, BASF and Shell. ARC CBBC is a virtual research consortium with three hubs located at the universities, linking together different fields of expertise. ARC CBBC covers the entire knowledge chain, from fundamental research on new chemical conversions and functional materials up to and including the development of new, energy-efficient processes and the development of new energy carriers and components for chemical building blocks

This summary pertains to the AWTI advisory report *Het stelsel op scherp gezet. Naar toekomstbestendig hoger onderwijs en onderzoek* ('Shaking up the system. Towards a future-proof higher education and research system'). The report may be found at www.awti.nl.

In preparing the report, two background studies were carried out on the organisation and functioning of the higher education and research system in England, as part of the United Kingdom, and in Switzerland. These background studies may be found at www.awti.nl.

The advisory report was prepared by a project group comprising Council members Sjoukje Heimovaara (chair), Dave Blank, Koenraad Debackere and Arno Peels, and staff members Hamilcar Knops and Annelieke van der Giessen (secretaries), Paula Gouw, Inge van den Bosch and student intern Isabelle Schroeten.

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