

LABOUR MARKET

# 'WORK FIELD WANTS SYSTEMIC THINKERS WITH EXPERTISE'

'Do not just teach students academic skills, but also teach them how to apply scientific knowledge'

BY GERT VAN MAANEN

Employers are quite satisfied with the academically trained biologists and biomedical scientists, but they also see points for improvement. 'Keep courses broad, ensure they are in-depth and teach students to work with applications.'

**T**rain biologists and biomedical scientists as broadly as possible, but also let them immerse themselves in knowledge that is specific to our sector. This seemingly difficult to fulfil desire from the professional field is one of the conclusions of the *Labour Market Research in Life Sciences and Biomedical Sciences in the Netherlands 2020-2021*, which The Netherlands Institute of Biology (NIBI) carried out on behalf of eight Dutch universities and of which the trend analysis was publicly presented on 20 September in the Consultation regarding Higher Biology Education (OHOB). The study consists of a combination of a written survey, in-depth interviews with employers and consultations with relevant branch and professional organisations in five sectors: Life Sciences & Health, Agri & Food and Horticulture, Ecology & Sustainability, Communication & Education and Policy.

An important general conclusion is that the consulted organisations in all fields are satisfied with the level of knowledge delivered by the university programmes in biology and biomedical sciences. Still, all sectors plead for a certain breadth in the study programmes, while also striving for a clear focus. For example, they insist on the importance of graduates being able to understand the biological systems and mechanisms that are specific to the professional field. However, between the five sectors consulted there are large differences in the knowledge elements, skills and attitudes that are considered most or least important. For example, the Life Science & Health sector deemed the knowledge elements molecular biology, cell biology and biostatistics very important while ecology and plant biology were seen as far less important. Whereas the Agri & Food and Horticulture sector underlined the importance of plant biology, genetics and biostatistics and regarded health technology and endocrinology to be less important.

**SURPRISING**

Therefore, the third main conclusion of the survey stating that respondents 'find knowledge of evolution of little importance', is somewhat surprising. The knowledge element 'evolutionary biology' indeed receives a low score in the sector Life Science & Health, but scores high in the sectors Ecology & Sustainability, Communication & Education and Policy. The research report translates the conclusion into a challenge for the study

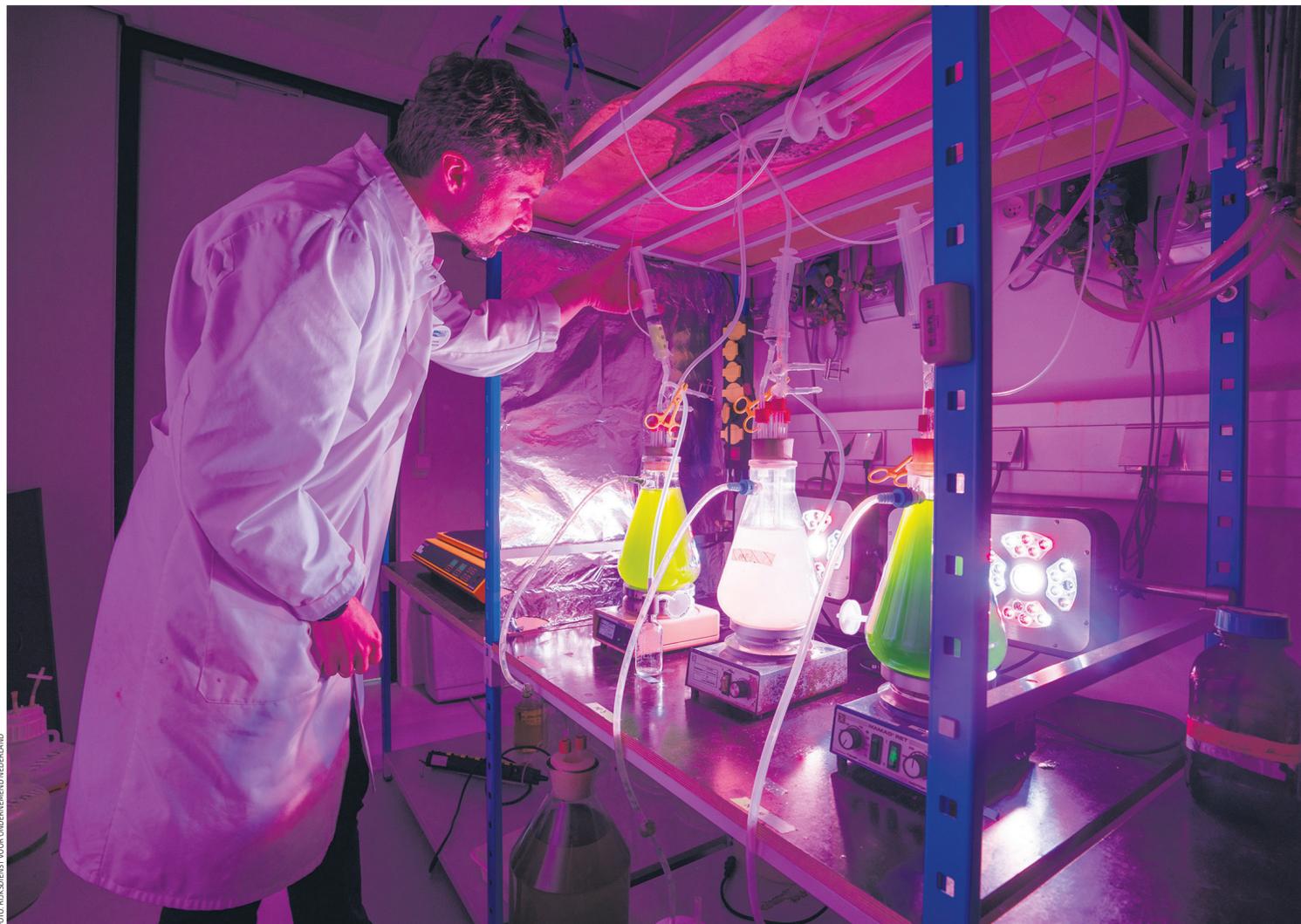


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programmes: 'to address evolution and evolutionary thinking in a context relevant to the professional field'. A recommendation that also resonates in a more general sense in the Trend Analysis 2009-2021, which NIBI director Leen van den Oever compiled based on three labour market surveys from 2009, 2014 and 2021. Biology and biomedical sciences are becoming more and more specialised, also in the respective bachelor programmes. 'It remains a challenge to give the knowledge of systems, indicated by the labour market as distinctive, a proper place in all study programmes, perhaps in different contexts', Van den Oever summarises. According to him, this also applies to the widely shared desire to provide students with sufficient knowledge in dealing with data. 'Biology is experiencing a massive surge in data handling activities in all fields. The reliable and statistically sound extraction of information

from data must be addressed more than ever in the study programmes. Biologists today are asked to make statements about the course of processes. Therefore, one of the main conclusions of the current labour market survey is that in addition to biostatistics, modelling is an indispensable part of the biologist's toolkit'.

**NEEDS**

The study identifies more needs that are common to various professional fields. For example, it is suggested to not merely focus on teaching the use of scientific publications as reporting tools, but also on policy advice or scientific journalism. In particular, coherent and convincing writing and presentation in Dutch seems to be a growing problem for graduates. All organisations find the scientific research internship important but suggest a second master's internship with a freer interpretation. 'Teach them to work in the context of applying scientific knowledge', says the report. The respondents also point out that the performance pressure on students is high, as they are being 'pushed through the system' and that a school mentality is overly prevalent. Students go to school, are given lessons and are often led to overcome challenges. The challenge is to focus less on that and more on delivering young, self-confident profes-

sionals with a critical attitude.

The research report also gauges the opportunities that employers see for people who have only completed a university bachelor's degree in biology or biomedical sciences. The Agri & Food and Horticulture, and Communication & Education sectors, with 84 and 80 percent respectively, see various opportunities for this, followed at some distance by Ecology & Sustainability, with 66 percent. The Policy and Life Sciences & Health sectors are generally more dismissive and only 40 and 23 percent of respondents see any opportunities for those graduates. The importance attached to foreign experience also varies. In Agri & Food and Horticulture, 62 percent of respondents attach importance to this, followed at a considerable distance by Communication & Education (38 percent) and Life Sciences & Health (33 percent). The Policy and Ecology & Sustainability sectors, with 17 and 15 percent respectively, attach the least importance to gained experience abroad. ■

The report *Arbeidsmarktonderzoek biowetenschappen en biomedische wetenschappen in Nederland 2020-2021* is available via the NIBI website: [www.nibi.nl/pagina/onderzoekarbeidsmarkt](http://www.nibi.nl/pagina/onderzoekarbeidsmarkt).

**TOP-5 SKILLS 2021 (2014)**

- 1 Reporting (-)
- 2 Communicative competence (5)
- 3 Acquiring new knowledge (3)
- 4 Working together (1)
- 5 Analytical thinking skills (4)

**TOP-5 WORK ATTITUDE 2021 (2014)**

- 1 Independent (4)
- 2 Critical attitude (-)
- 3 Solution-focused (1)
- 4 Self-reflection (5)
- 5 Curious (-)

**EXPERIENCES OF EMPLOYERS**

Annemieke van Agthoven is the human resources manager at Koppert Biological Systems, a supplier of biological pesticides and other sustainable cultivation innovations, with six hundred employees and a head office in Berkel en Rodenrijs



'We have many students on work placements in our research and development department, often even up to thirty or forty per year. At the moment, they leave the company after their internship without meeting anyone from human resources. We are going to change that soon, because we want students to really get to know our company and to discuss the possibility of working together now or in the future. Connecting education to the labour market is a joint-responsibility, for which we can set up initiatives together'.

'It is good when students also learn that doing research costs money and therefore must be profitable. We still often see that 'good' is a very difficult concept for researchers. They strive for perfection, but then there is always a risk that there is no longer a need for a product, because market developments always continue. Working in a more market and client-oriented way and connecting with the client at an earlier stage can ensure that products become better. This requires active cooperation and should also be applied to training and education

processes. By seeking cooperation, we can strengthen each other and ensure a better connection. After all, we have a common interest. Students acquire knowledge and skills and their diploma provides them with a starting qualification, but it is important that the student has a good connection with the practice/work field. That is why study programmes must open themselves up to businesses and the same applies the other way around. Universities and companies should get together and organise round table sessions to test courses for their practical use, develop modules together and make better use of each other's knowledge.'

Eric Schouwenberg is the head of the nature and biodiversity advisory group at Arcadis, a global company with 27,000 designers and consultants in the field of the natural and constructed environment, headquartered in Amsterdam



'In general, the basic knowledge of applicants is fine. Compared to the past, there is perhaps less knowledge of the work field and the various species and perhaps a less ingrained passion for nature and biology. What is most striking is that we perceive less profound systemic knowledge of ecosystems; an understanding of how landscapes and ecosystems work together. It is very important for us that our people have this broader perspective and understand the social context. Legislation and regulations also

come into play. When dealing with something like the nitrogen problem, many legal components are involved. It helps if you understand this and take this into account when giving advice'. 'Graduates are still very much focused on research and drawing conclusions, but they often lack the skills to give good advice. You must be able to really put yourself in the client's shoes and -explain and clarify recommendations in a comprehensible and convincing way. You can teach this very well by giving

students practical assignments and require them to give real advice as the end result. We have had good experiences working together with Utrecht University. It would be nice if universities and the professional field would cooperate more often in this way during internships or courses'. 'We also notice that graduates have difficulty reporting in Dutch. This is probably due to the rise of English at universities and the fact that some courses are now entirely in English. However, if you are going to work for Dutch clients, you will have to be able to express yourself well in Dutch.'

**OPPORTUNITIES WITH ONLY A BACHELOR'S DEGREE**

Table: Percentage of employers who see opportunities within their organisation for people who have completed a university bachelor's degree with examples of the type of positions (in 2014 and in 2021)

Sector	Percentage 2014	Percentage 2021	Type of functions
Life Sciences & Health	21	23	Junior positions such as junior CRA, clinical trials project officer, trainee
Agri & Food and Horticulture	43	84	Research assistant, technician position with career opportunities to researcher
Ecology & Sustainability	22	66	Junior consultant, general assistant, field assistant, data processor, junior project leader
Communication & Education	33	80	Second-grade teacher if qualified, junior education officer, assistant publisher
Policy	0	40	Junior policy advisor

**'Biologists nowadays are asked to make statements about the course of processes'**