Digitally Competent Graduates

Final report

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Niels Lehmann
Vicedean of Education, Arts and The Education Committee's PI for DKK

Tina Bering Keiding
Division Manager, Programme Development, CED

Dorte Sidelmann Rossen
Special consultant, Programme Development, CED

CENTRE FOR EDUCATIONAL DEVELOPMENT - CED
AARHUS UNIVERSITY

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1.0 Summary

The Digitally Competent Graduates project was the third main initiative in AU's comprehensive, long-term digitalisation strategy that was launched in 2017. The first main initiative focused on strengthening digital research ecosystems. The second focused on the development of educational IT infrastructure and the systematic use of educational IT applications.

The goal of 'Digitally Competent Graduates', the third main initiative, was to ensure that all AU graduates acquire the digital competencies relevant to their subject. This goal was to be achieved by incorporating digital course elements and methods into the curriculum and by developing the digital competencies of teaching staff within these areas.

The main initiative 'Digitally Competent Graduates' was comprised of four sub-initiatives:

- Analysis of AU's degree programmes to map the need for digital development
- Development of the programmes' curricula
- Competency development for teaching staff
- Extracurricular coding camps for particularly motivated students

Two targets were set for the initiative, to be reached by the end of 2025:

- Development of a plan for the digital development of 40-50% of AU's approx. 80 full-time programmes
- Participation in formal or informal competency development, for example participation in courses and upskilling or collective development process, on the part of 400-500 members of teaching staff.

As the final evaluation shows, this initiative has met all of its objectives fully, and has already made a profound impact on AU's degree programme portfolio. During the extended strategic framework period:

- an analysis of the digital development needs of 122 out of AU's 212 degree programmes – corresponding to 57% (target 40-50%) – was carried out, plans to address them were developed, and the first steps in implementing the plans were taken. For some programmes, the changes required are minor and can be implemented immediately, while for others, long-term efforts are necessary that involve building research capacity, further competency development in relation to subject-specific digital competencies, and curriculum development.
- 2309 teaching staff participated in formal competency development (target 400-500 teaching staff) focussing on both learning technology and subject-specific digital topics.
- a significant number of external grants were awarded to AU to support both subject-specific digital competency development and the development of the degree programmes' digital curricula.

- several extracurricular activities were developed and offered aimed at enabling particularly motivated students to acquire digital competencies.
- initiated curriculum development on a wide range of the university's degree programmes.

All faculties will include the dimension of digitalisation in their upcoming strategic programme development work. Generative AI is a recurring theme at all five faculties that has implications for all three main initiatives under AU's digitalisation strategy (2017-2025): Development of digital research ecosystems, Educational IT and 'Digitally Competent Graduates'. The project Assess GenAI, launched in 2025, will support these efforts.

In much the same way as the 'Educational IT' project prepared Aarhus University to deliver online teaching on a large-scale during the COVID19-lockdown, the 'Digitally Competent Graduates' project has been an important precursor to the university's work on Generative AI. We assess that the project has contributed significantly to establishing a solid foundation for realising the university's ambition to be a digital frontrunner that is "ahead of technological developments and the labour market demand for graduates with digital competences". It has done so by helping to ensure that students and staff are "equipped to navigate in a digital society", as stated in "Strategy 2030".

In the next strategy period, the Education Committee will work intensively to identify ways of incorporating Generative AI into the programmes. This includes adjustments to exam formats, ensuring that graduates acquire sufficient competences to use Generative AI, and making use of the didactic opportunities offered by AI.

2.0 Introduction: Background and structure of the report

This report summarises the results of the strategic initiative 'Digitally Competent Graduates' (DKK), which supports goal 5 in AU's strategic framework contract 2022-2025*: 'Strengthen* digital competencies on the degree programmes to equip students for the labour market of the future'.

2.1/ Digitally Competent Graduates in relation to AU's overall digitisation strategy

The Digitally Competent Graduates project was the third main initiative in AU's comprehensive, long-term digitalisation strategy that was launched in 2017. The first main initiative focused on strengthening digital research ecosystems. The second main initiative focused on increased, systematic implementation of educational IT to improve learning outcomes and time on task. During the period 2018-2023, the initiative resulted in the coordinated development of the educational IT landscape and a wide range of development and competency development activities aimed at providing teaching staff with the competencies they need to employ educational IT to make their teaching more varied and engaging.

In its capacity as the third main initiative, 'Digitally Competent Graduates' thus continued to build on several years of work with digitalisation by "initiating the further development of all programmes with a view to digitisation". The objective of the initiative was to ensure that all students acquire digital competencies through the incorporation of digital methods and subject-specific digital content in curricula and to develop the digital competencies of teaching staff (AU's strategic framework contract 2022-2025, p.9). This was to be achieved by incorporating digital course components and methods into the curriculum and by developing the digital competencies of teaching staff within these areas.

Although the three main initiatives address different aspects of digitalisation, there will be issues that involve more than one of them. For example, the development of digital research ecosystems will often be closed linked to the development of the digital curricula of the degree programmes. By the same token, the issue of AI/Generative AI is relevant to research and digital learning opportunities as well as the curricula of degree programmes (see section 4.4).

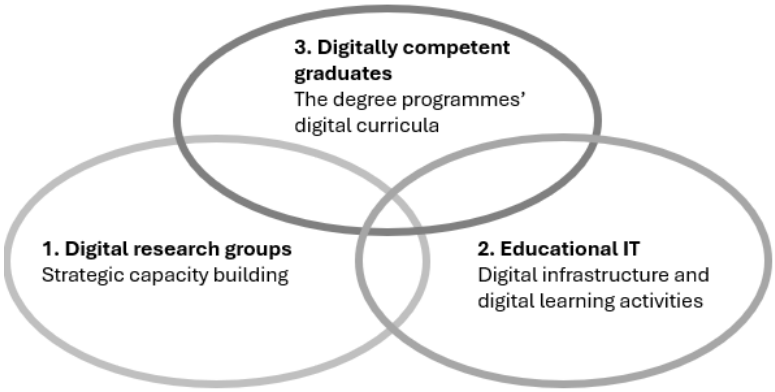


Figure 1. The three main initiatives of AU's digitalisation strategy for the period 2017-2025

2.2/ Sub-initiatives and objectives

'Digitally Competent Graduates' (DKK) was comprised of four sub-initiatives:

- Analysis of AU's degree programmes to map the need for digital development
- Development of the programmes' curricula
- Competency development for teaching staff
- Extracurricular coding camps for particularly motivated students

Two targets were set for the initiative, to be reached by the end of 2025:

- Development of a plan for the digital development of 40-50% of AU's approx. 80 full-time programmes
- Participation in formal or informal competency development, for example participation in courses and upskilling or collective development process, on the part of 400-500 members of teaching staff.

A separate target was not set for Sub-initiative 2, and no separate account of progress and results will be provided. This is because the specifics of the development of the degree programmes' digital curricula, in addition to the analysis (Sub-initiative 1), must take a number of other factors into account, such as capacity building of the research ecosystem's digital capabilities or local educational strategic initiatives, in order to ensure long-term development and solid anchoring of the degree programmes' curricula. The positive consequences of this decision for curriculum development are addressed in section 4.3. To provide insight into this development work, section 6 contains an example of curriculum development from each faculty. No separate target was set for Sub-initiative 4 either. However, the report contains examples relevant to this sub-initiative from each faculty as well.

The following report reviews the *DKK initiative under four headings:*

- Results in relation to targets (section 3)
- Lessons learned in relation to curriculum development (section 4)
- The faculties' next steps in digital development work (section 5)
- Examples of curriculum development (section 6)

3.0 Results of the DKK initiative

This section explains the impact of the Digitally Competent Graduates initiative seen in relation to the four sub-initiatives and the targets set for them.

3.1/ Analysis of the need for digital development

The ambition was that by the end of 2025, a plan would be in place for 40-50% of AU's approximately 80 full-time programmes with a view to the digital development of the programmes. However, the method of calculation, according to which the Bachelor's and Master's degrees within the same subject were counted as one programme, proved challenging when it came to degree programmes where no self-evident link exists between qualifying BA/BSc and MA/MSc programmes, for example the BA Engineering programmes, as well as in connection with MA/MSc programmes with admission from multiple BA/BSc programmes.

On this background, the Education Committee – in line with the Danish qualification framework – decided to classify BA/BSc and MA/MSc as separate and independent programmes. As a result, the number of degree programmes on which calculations were based increased from 80 to approx. 200. The target of having a plan in place for 40-50% of the programmes by the end of 2025 was retained.

Figure 2 shows how many degree programmes have carried out an analysis of current and future curricula and drafted a plan for the development of their digital profile on this background.

	Arts	BSS	HE	Nat	Tech	Total
Number of degree programmes	41	16	13	34	18	122

Figure 2. Overview of total number of degree programmes that have formulated a plan for the development of their digital profile. As of 15 November 2025, there were 212 degree programmes at AU.

A plan has been drafted for 122 out of the 212 degree programmes, corresponding to 57%; the target set for the analysis of the need for digital development has thus been met. In addition to meeting the original target in the framework agreement – formulation of a plan for 40-50% of the degree programmes – this result also shows that this effort has been continued in the extended framework contract.

The analysis and development of curricula took place at subject level in connection with faculty-wide processes. Many subjects involved the degree development team under AU's Centre for Educational Development (CED) in their analyses.

The scope of this work and any associated resultant changes in curricula depended on whether the degree programme in question already had a well-defined digital competency profile, or whether the degree programme was faced with identifying and systematising the significance of digitalisation for graduates' qualification profile and thus for the programme's curriculum.

It was possible to classify the change processes in the plans across the degree programmes reviewed in three levels:

- *Minor development process.* Not surprisingly, degree programmes with a strong digital qualification profile belong to this category; in addition, it includes degree programmes that were already in the process of or had just completed a comprehensive revision of their academic regulations, for example the BA in media studies and the BSc in physics.
- *Moderate development process*. This category contains programmes which already contains digital elements, but where their analysis has concluded that while an extensive development process is not necessary, it would be advantageous to clarify such elements in their academic regulations. In these cases, plans typically point in the direction of the development of a more explicit digital dimension in the competency profile, more explicit learning objectives for digital competencies in selected course elements or embedding additional digital elements that can be implemented within the framework of the existing academic regulations, for example the BSc and MSc in odontology.
- *Major development process.* This category includes degree programmes where a fundamental revision of parts of the curriculum are necessary, in some cases also supported by capacity building on the research side, as well degree programmes facing minor or moderate development processes that contain elements that require more intensive work, for example the BA in Scandinavian languages and culture.

3.2/ Formal competency development for teaching staff

The development of the degree programmes' digital curricula often requires – particularly in subjects where digital topics and methods are relatively new aspects of the academic profile – both targeted recruitment efforts to ensure research depth in the relevant digital areas and broad capacity building in the subject ecosystem to ensure the necessary understanding and anchoring of digital competencies across the programme's course elements.

At the same time, it is important to maintain and further develop capacity building around educational IT, which was the focus of the second main initiative in AU's overall digitalisation initiative, so that AU's teaching staff have the necessary skills to use both new and familiar learning technologies in ways that benefit the students' learning process.

For these reasons, Sub-initiative 3, 'Competency development of teaching staff', includes both offerings focussing on subjects' digital topics and methods as offerings within educational IT. Figure 3 shows the total number of participants in formalised competency development.

Year	2023	2024	2025	Total
Number of participants	755	867	687	2.309

Figure 3. Number of participants in formalised digital competency development.

The slightly higher figure for participation in formal competency development in 2024 can primarily be explained by the advent of Generative AI. Many members of teaching staff wanted to acquire both a basic understanding of the technology itself and inspiration as to how it could be used to support students' learning processes. In other words, this is a case of competency development with a clear focus on learning technology and thus a continuation of Key Initiative 2 from AU's overall digitalisation strategy (Figure 1).

In relation to the ambition to have between 400 and 500 members of teaching staff participate in formal or informal skills development, Figure 3 shows that developments far exceeded expectations based on formal competency development alone. At the same time, there was extensive informal competency development taking place at all faculties. Informal competency development, which is described in more detail in section 3.3.

3.3/ Informal competency development and digital development projects

Throughout the DKK period, in addition to formalised competency development, there was quite a lot of informal competency development, for example in the form of peer-to-peer training or participation in locally organised seminars at subject level. These kinds of activities were particularly widespread in connection with the development of the degree programmes' digital curricula. Due to the information character of these activities, it is difficult to determine how many teaching staff participated in them with any degree of certainty. However, data from the vice-deans over the years confirms that these activities were faculty wide. Below is a brief example from each faculty. These examples reflect the effort that has been and is still put into giving teaching staff a solid grasp of Generative AI, in relation to the challenges the technology poses in relation to exams, its potential as a learning technology and the demands the technology places on the digital competencies of graduates.

- At Arts, the significance of Generative AI for the degree programmes' exam system, exam formats and exam design was the overall theme of two seminars held by the Forum for Education at Arts. The aim of the seminars was to create a shared understanding of the challenges and opportunities presented by the technology. At the first seminar, the main topic was the interplay between the degree programmes and their competency profiles and exam formats. The second seminar focused on the overall structure of the degree programmes' exam system and the challenges Generative AI poses for the relationship between learning objectives, learning objectives and assessment.

- At BSS, internal frontrunners within Generative AI as a learning technology have shared their knowledge in the form of informal competency development and degree programme development. Among other activities, talks and workshops on Generative AI in research and teaching were held, with a focus on specific work processes and quality assurance.

In relation to Generative AI as a learning technology, an in-depth development project was carried out in a smaller group to explore the opportunities and challenges associated with developing and deploying customised chatbots (for example RAG-based solutions) for academic purposes. The results of this work were communicated to colleagues through presentations and workshops. Finally, in relation to the development of the degree programmes, there was general discussion on the significance of Generative AI for student's future digital qualification profiles.

- At Health a taskforce was appointed under the aegis of the DKK initiative to support faculty initiatives through coordination, knowledge-building and knowledge-sharing. The taskforce recommended establishing a forum for the digital competencies of teaching staff. The forum has since been established. As an example of informal competency development, under the aegis of the forum, a pilot project was carried out involving the establishment of Generative AI study groups for teaching staff focussing on relevant aspects of the technology. The study group's work centred on the course AI in Education - Online Course - FutureLearn developed by one of AU's partner universities in the European University Alliance | Circle U.

- At Nat, a one-day knowledge-exchange event was held in the spring of 2025 on AI in Natural Science Teaching for all teaching staff involved in the faculty's BSc courses, with a view to exchanging knowledge based on existing examples in addition to sessions where teaching staff could exchange ideas in smaller groups – both with regard to Generative AI as a learning technology in the teaching situation and strategies for developing digital competencies for use in research and in individual work routines more generally.

- At Tech, a 'didactic day' is held every year to provide inspiration and contribute to knowledge-sharing across subjects. In addition to plenary keynotes i on the year's main theme, the programme consists of a number of workshops on relevant topics on university teaching. In 2025, the main theme of one of the day's keynotes was the question of how Generative AI is changing both teaching and learning at universities and demands new digital competencies. Two of the day's workshops addressed digital topics as well: the use of M365 to support collaborative teaching activities, as well as challenges and opportunities associated with customised chatbots.

To a big extent, AU's digital competence development is supported by larger development projects, which have in common that they combine competency development with building research capacity and/or curriculum development through various formats for action learning. Figure 4 shows a selection of such projects from the period 2022-2025. The potential of this approach is underlined by the fact that these projects are all partly externally funded and, in several cases, cross-institutional. A number of these projects were approved and launched in 2025, thus contributing to a continued focus on the digital development of AU's programmes.

Project	Period	Organisational anchoring
Digitalization4Humanities	2025-2027	Arts/Cross-institutional
Exploring Agentic AI Tools for Management Education	2025	BSS
Fostering AI Literacy and Innovation with LLMs	2025	NAT
Assess GenAI: new digital competencies and forms of assessment	2025-2027	All faculties/Cross-institutional
AI literacy in language programmes: studying foreign languages in the age of AI	2024	Arts
Teach GenAI and Teach GenAI@AU: teaching with and about Generative AI technologies	2024-2026	All faculties/Cross-institutional
Digital competencies within molecular biology	2023	NAT
Digital Literacy. Digital methods for researchers in the humanities and social sciences Three throughputs	2023	Arts and BSS/Cross-institutional
KUBU (Competency development in education for the construction industry)	2020-2023	TECH/Cross-institutional
Digital Curriculum (Digital competency development based on curriculum development in the digital age)	2020-2024	Arts and BSS/Cross-institutional

Figure 4. Selection of initiated or ongoing project-based education and competence development activities at AU in the period 2022-2025. All projects are partially externally funded. For additional examples, see IT University West_Supported projects

The ongoing collection of experiences conducted alongside the monitoring of target figures shows that competency development aimed at the degree programmes' digital curricula, to a greater extent than competency development aimed at general pedagogical and learning technology issues, tends to be informal in nature or connected with development projects. This is primarily because the question of relevant digital topics, issues and methods is so closely linked to research and teaching in particular subjects that it is difficult to establish relevant formal competency development programmes with broad relevance. Teaching activities that support students' ability to code in Python is one example of this subject-specificity. In addition to a basic knowledge of Python as a programming language, there will be different problems and analytical procedures, and thus different programming skills that will be relevant to achieve, depending on whether this takes place within the framework of the BEng in biotechnology or the MA in Scandinavian language and literature.

In addition, the various aspects of digital development (research, degree programme curricula and competency development) are often closely linked, which makes collective subject-specific development projects an obvious format for academically and organisationally robust development processes.

3.4/ Extracurricular coding camps for particularly motivated students

Particularly in cases where programmes are facing a major development task in relation to the digital curriculum, it has been useful to develop extracurricular offerings that give current students the opportunity to develop their digital competencies. This has involved both cross-faculty and faculty-specific activities, for example:

- During this period, Arts offered two to three extracurricular workshops per year, including "Digital methods for all," an introduction to digital analysis of sources from the internet, "Web programming," an introduction to website construction, and "Generative AI for BA projects and Master's theses," which aimed to encourage responsible and learning-oriented use of enerative AI in longer written assignments.
- HE hosts AI cafés for students working on project assignments, Master's theses or Bachelor's projects. The cafés are open to all students and are offered regularly every semester. Two Coding Camps were also held for students at HE and NAT.
- At NAT, weekly coding camps (3 hours) were held for students in connection with the subject "Genome analysis and statistics" with a focus on supporting their learning in the course. The scheme was tested on three occasions with a particular focus on establishing best practice with a view to implementing the activity in the new, combined Bachelor's degree programme in molecular biology and molecular medicine.
- TECH has worked to support students' programming competencies. In 2025, partly supported by the IT-vest-funded project Teach GenAI@AU, the development of extracurricular offerings in Playful Coding in Python was initiated at three of the faculty's engineering departments. Programming-oriented course elements are already included in the curricula of the programmes at these departments, but in light of a new recruitment strategy and the resultant increased diversity of the student body, the faculty has assessed that an extracurricular offering that lowers the barrier to learning would support learning outcomes, retention and well-being.
- Across BSS, HE, NAT and TECH, in collaboration with the Royal Library and CED, a major trial of the so-called PIX system (The Pix Platform) was conducted in the period 2023-2024 with a view to assessing whether the system could function as a common framework for the ongoing development, evaluation and certification of students' general digital competencies. The PIX system is based on the DigComp 2.2 framework (see section 4.2). However, the conclusion was that the resources spent on local adaptation and operation were not commensurate with the benefits, and that students' digital skills are more appropriately documented through the curricula of the programmes.

4.0 The DKK initiative: Lessons learned in relation to curricular development

In addition to the ongoing and final monitoring of the DKK initiative in relation to the targets (see section 3), the initiative was monitored from a didactic development perspective with a view to identifying lessons learned that might contribute to this work going forward, including in particular Sub-initiative 2, 'Development of the programmes' curricula'.

This has primarily taken place through regular dialogue between vice-deans, directors of studies and heads of degree programmes. In addition, AU's Centre for Educational Development (CED) systematically and regularly collected experiences in connection with facilitating development work and conducted a series of wrap-up interviews with key individuals from all five faculties. The highlights from these activities are summarised below.

4.1/ Models for curriculum development

The analysis of curricula for digital competencies and development of plans for how digital competencies can best be embedded in existing or new degree programmes has shown that different models are being used. Generally speaking, it was possible to identify four approaches regarding how the degree programmes organise the learning activities that support students' acquisition of subject-relevant digital competencies.

- *The extracurricular approach,* whereby digital competencies are acquired outside the formal curriculum in the form of teaching activities that students must actively choose to participate in.
- *The integrated approach,* whereby digital competencies are embedded in and acquired as integrated aspects of multiple courses without being the sole focus.
- *The distributed approach,* whereby one or more course elements is dedicated to supporting students' acquisition of digital competencies.
- *The interdisciplinary approach*, whereby digital competencies are acquired through curriculum elements shared by several programmes, for example in the form of online resources that can be integrated into multiple courses or as a course offered on multiple degree programmes.

The four approaches to embedding digital competencies differ with respect to how the digital elements are linked to the overall structure of the programme and whether they take the form of independent course elements or are incorporated into other course elements (Figure 5).

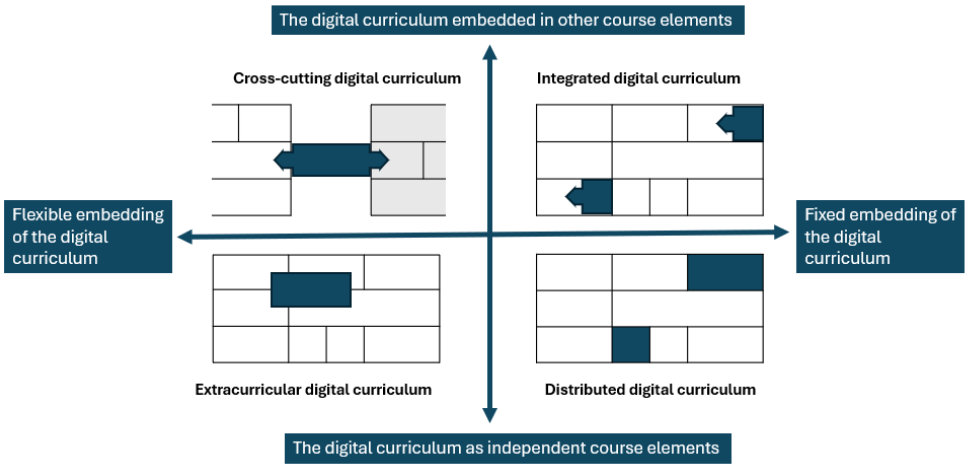


Figure 5. Four models for embedding digital competencies

Degree programmes will often combine approaches, depending on how the digital competency in question relates to the programme's overall curriculum. One example is the BSc in animal science, which contains a compulsory course element in the first semester that introduces basic digital methods (distributed approach). The acquired competencies are applied and further developed in other course elements (integrated approach). See section 6.5

The four approaches have been developed through multiple experience-based iterations and are used to facilitate discussions on how digital competencies can be incorporated into degree programme curricula. Particularly in cases in which a degree programme did not yet have a digital profile, this has been an opportunity to consider options for working on the long-term development of a digital profile, while also giving students the opportunity to acquire the relevant competencies in the short term – for example, by starting with an extracurricular approach and then gradually developing activities that are more closely linked to the other course elements of the programme.

4.2/ DigComp 2.2 as an overall framework

Early in the project period, the internationally recognised framework for digital competencies, *'DigComp 2.2 – The Digital competency Framework for Citizens'* was examined and tested as a framework for understanding what digital competencies can be. After a few adjustments to tailor the framework to AU's context, the Education Committee decided that it could be used as a tool for dialogue and inspiration in discussions of the various dimensions of the digital competency profile for the degree programmes.

Based on this decision, the Centre for Educational Development (CED) developed the dialogue tool shown in Figure 6 to support the subjects in their analysis of digital topics and methods of their degree programmes and the associated digital competencies. The model's framework for the analysis of the digital curriculum has two levels: In relation to the overall qualification profile of the degree programme and more specifically in relation to the individual course elements.

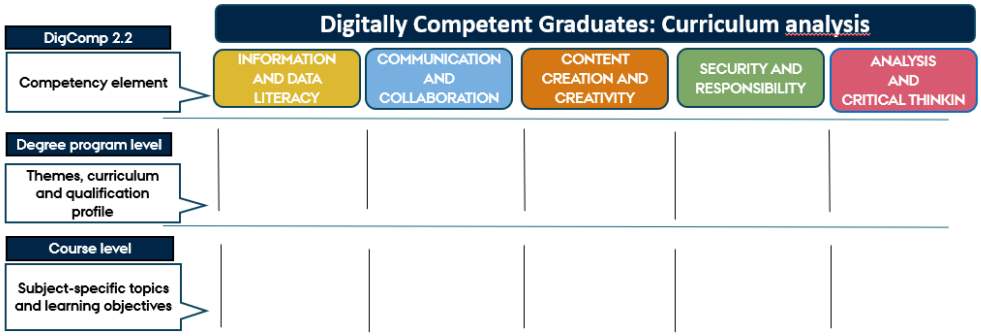


Figure 6. Dialogue tool developed to frame discussions of specific digital competences

Lessons learned from using the DigComp 2.2 framework are as follows:

- The framework provided a shared set of concepts for describing digital competencies and thus helped enable knowledge-sharing and dialogue both within and across programmes and faculties. This was valuable both in competency and development processes and in relation to knowledge-sharing in more informal forums.
- The five dimensions provide a broad perspective on what digital competencies can be. This offers potential for identifying important digital competencies that, for various reasons, have not been explicitly included in the programme's curriculum. This can be seen, for example, in relation to 'security and responsibility', which is included in many degree programmes, but which often takes the form of a both self-evident and implicit aspect of students' ability to work with digital issues and methods. However, the breadth of the framework also means that degree programmes must prioritise in order to ensure a meaningful balance between digital competencies and the overall profile of the programme.
- The highly generic description of the five competency dimensions has contributed to the model's applicability across subjects, while also making it possible to formulate both competency profiles and learning objectives precisely in relation to each individual programme.

4.3/ From plan to practice: depth and temporality in development processes

For some subjects, the 'Digitally Competent Graduates' initiative primarily involved reviewing the digital competencies that were already embedded in their degree programmes or that were in the process of being incorporated into their programmes as part of ongoing processes. For other subjects, this was a completely new task, that required a lengthy process of identifying the subject-relevant digital competencies that must now be systematically integrated into the programmes. As a consequence, the processes can be experienced as either an incremental development or a more radical transformation of the subject, and thus as more or less demanding.

By decoupling the analysis of development needs from the development process itself, the subjects were thus able to articulate their overall development needs and draw up a plan in which it was possible to integrate the development of the digital curriculum is with other initiatives, such as long-term revisions of academic regulations, research strategy priorities and competency development.

It thus appears that the faculty-based organisation and the division of the initiative into Sub-initiative 1 'Analysis of AU's degree programmes to map the need for digital development' and Sub-initiative 2 'Development of the programmes' curricula' (see section 2) were crucial to the success of the initiative and an important contribution to sustainable development processes.

4.4/ Future perspectives: AI/Generative AI as a subject-specific digital competency

AI and Generative AI in particular have a significant impact on the digital curriculum in education that some of the development plans drawn up just a few years ago already need to be revised.

The first educational questions related to AI and Generative AI in particular concerned issues of examination and validity in testing, as well as the opportunities offered by learning technology to support the acquisition of subject content – regardless of whether this had a digital dimension or not.

At the joint closing seminar for the DKK initiative, which was attended by more than 50 people with responsibility for educational development, it became clear that AI/Generative AI, more than any other technology, influences research, students' work with academic content, and the digital competencies that future graduates must possess. In this sense, AI and Generative AI in particular intersect with all three dimensions of AU's digitalisation efforts to date, which places them at the nexus of the three overlapping circles (Figure 1).

Several societal developments underline the need to incorporate AI into higher education programs. Not least, the Draghi-report emphasizes that it is crucial for Europe to catch up with developments in the US. Similarly, reports from the consultancy Gartner point to a near future in which there will be virtually no academic jobs that are not carried out with the support of Generative AI.

The primary aim of the degree programmes must continue to be deep disciplinary expertise. The challenge, therefore, is to develop programmes in which students can both strengthen their subject knowledge through the appropriate use of Generative AI and acquire competences in applying Generative AI itself.

However, this inclusion of Generative AI requires teachers who are themselves familiar with these tools. In the coming period, it will therefore also be necessary to invest substantially in professional development of teaching staff, while at the same time building the infrastructure needed to support the continued development of programmes and teaching.

5.0 The faculties' plans for the future

Taken as a whole, 'Digitally Competent Graduates' has created a solid point of departure for AU's continued digitalisation efforts through:

- systematic analysis and planning of the digital development of the degree programmes' digital curricula
- competency development for teaching staff, both in the form of continual competency development within the field of learning technology and through informal and project-based development activities related to the subjects' digital topics and methods
- extracurricular activities for particularly motivated students
- curriculum models and analytics tools that can support development work going forward

The coordinated – but still faculty- and degree programme-aligned approach – has ensured immediate relevance and provided a deeper understanding of differences from faculty to faculty. In line with this, the future focus areas will also be different from faculty to faculty.

5.1/ Arts: Digital competencies in all degree programmes

The faculty's educational development in the coming years will be strongly influenced by the comprehensive plan adopted by the faculty leadership team because of the Master's degree reform. According to an approved implementation plan, all the faculty's programmes are to be completely revised by 2030. In connection with this process, the vice-dean circulated a memo which, among other things, emphasises the importance of incorporating digital competencies into all programmes and highlights the need to address the challenges that Generative AI poses for the design of examinations. On this background, it will be possible to bring the work done under the aegis of DKK to fruition. For those degree programmes for which where development plans for their digital profile have been developed, the task is to implement them. Regarding the degree programmes for this is not this case, it will be necessary to accelerate the process, drawing up the plan in parallel with the revision of the academic regulations. In the case of a few degree programmes, digitalisation steps that have already been implemented will be reviewed with a view to upgrading them, including incorporating Generative AI skills.

5.2/ BSS: AI as a learning and subject-specific technology

BSS' goal is always to strengthen its programmes through high-quality, research-based teaching with a focus on labour market relevance and on creating good job opportunities for the faculty's graduates. Regarding digitalisation, this means there is a consistent focus on developing degree programmes by incorporating and embracing new technologies where relevant. Currently, there is a focus on digital competencies in relation to AI, just as in recent years there has been a focus on redesigning examinations that have been challenged by AI.

The individual degree programmes work with AI-driven development in relation to pedagogy and didactics. For example, some courses employ AI-based digital instructors. What is crucial is that degree programmes reflect the new digital reality in order to ensure their relevance both in terms of students' current learning processes and future work situations. For this reason, the degree programmes incorporate and embrace AI in relation to the specific academic context, so that students learn to understand, apply and make critical choices in this regard. Going forward, there will be an increased focus on integrating AI tools as a natural part of all degree programmes. In addition, there will be a focus on ensuring that teaching staff are offered ongoing competency development in digital methods so that their teaching reflects the latest knowledge and practices.

5.3/ HE: Three-part development effort

Based on CED's developed Dialogue Tool, the faculty formulated a number of general digital competencies that are relevant to all the faculty's degree programmes (see section 6.3). Within this framework, the subject groups subsequently discussed and formulated the digital competency profile and course elements for each programme, which will be included in ongoing and future revisions of the academic regulations. In coming years, development will thus take place in three domains: Students, academic/teaching staff, curriculum.

- *Students:* Generative AI as a learning technology is included in the study competencies course provided by the Royal Danish Library. All students encounter this at different points in their studies (commencement of studies, start of Bachelor's project and start of Master's thesis). On some programmes, students are offered a masterclass in AI technology, and at the Department of Public Health, all students with large projects are given an opportunity to participate in AI cafés during the semester. In the spring of 2026, another extracurricular coding camp will be held, and an assessment will be made as to whether the need has shifted with a view to continuing to offer this activity to particularly interested students, or whether the degree programmes now meet this need.
- *Academic/teaching staff:* A teachers' forum for teaching staff with a particular interest and expertise in Generative AI will continue its work. The forum assesses the usefulness of external courses within AI. These courses can cover AI as a learning technology or as a subject-specific method. They also share their own knowledge and function as 'ambassadors' on their own degree programmes. All academic staff are offered an opportunity to participate in courses on the use of Generative AI in the research process, as well as knowledge and competencies that can be used in supervising students who are designing larger project assignments. Individual teaching staff must incorporate relevant digital topics and tools in their courses, as described in the relevant academic regulations.
- *Curriculum:* HE has a strategic framework for developing its degree programmes, and digital learning objectives are one of the elements. The inclusion of digital learning objectives that have already been adopted will take place in connection with the current revisions of the academic regulations. The academic regulations define the level of the learning objective (knowledge, skills or competency). No specific tools are named in the academic regulations, as developments are happening so rapidly. HE will monitor the implementation of the new degree programmes, among other things to ensure that individual courses, regardless of whether they involve digital topics and tools in the subject or digital learning tools. Digital learning tools challenge our ability to ensure that individual students achieve the desired learning objectives.

The connection between subjects, teaching and testing will be a topic that will be discussed regularly in 2026, starting with a theme day at the Health Forum for Education in spring 2026.

5.4/ NAT: Creative digital competencies

Over the past five years, the programmes at NAT, under the auspices of the "Digitally Competent Graduates" project, have mapped and assessed the generic digital competencies that the programmes equip students with. At NAT, all students are users of digital solutions, while some also develop or will develop such solutions themselves. The programmes have also evaluated digital competencies and whether they are adequate to the real-world challenges within the specific subject area of the programme.

In the coming years, NAT will work with a common strategic direction in relation to more creative digital competencies, while still maintaining a strong focus on subject-specific digital competencies. In other words, how natural science degree programmes should respond to a society and labour market characterised by rapid technological development. In addition, NAT's degree programmes are working to examine existing examination formats, not least in light of the use of Generative AI, which was launched at NAT's 2026 education day.

5.5/ TECH: AI as a transformer of subjects and disciplines

At the Faculty of Technical Sciences, educational development in the coming years will be strongly influenced by the implementation of the work-integrated Master's degree programmes at all departments. We anticipate that this will result in more project-oriented modules and thus provide an occasion to rethink of the examination forms at portfolio level with a special focus on AI. Finally, in the coming years, TECH will focus on the use of AI not only as a tool, but as a means of transforming subjects and disciplines. In this connection, TECH will be actively involved in the cross-university project Assess GenAI, including through the coordination of one of the subject-specific tracks.

6.0 Examples of curriculum development

In addition to identifying the development needs associated with Sub-initiative 1, extensive development work has been carried out on the curricula of many degree programmes (Sub-initiative 2). The following describes an example from each faculty of how identifying the digital competencies of the future has led to concrete changes in the curriculum of the programmes.

6.1/ Arts: Digital History – from non 'digital native' to a programme with a digital profile

 # Interaction between the development of research groups and educational development
 # Different models for supporting digital elements over time

Contact: *Nina Javette Koefoed.* Email: *hisnk@cas.au.dk*

Digitalisation affects the field of history in several areas and, in recent years, has developed into an independent dimension of history under the heading 'Digital History'.

'Digital History' covers a wide range of topics, including everything from the use of digital methods in historical analysis and the importance of digitising archives, catalogues and collections to the popularisation of history on social media and other digital platforms.

Digitalisation opens new opportunities but also presents a number of challenges that affect all aspects of historical research, from source collection, methodology and analysis to teaching and dissemination. It has therefore been crucial to develop both the Bachelor's and Master's programmes in history towards a digital curriculum that provides graduates with the necessary competencies to work with digital tools and methods within the field of history in a professional manner.

As history is not a 'digitally native', the path towards a clear digital profile in the curriculum has involved a number of iterations. These can be summarised in three steps:

Step 1: BA Academic Regulations 2018-2020

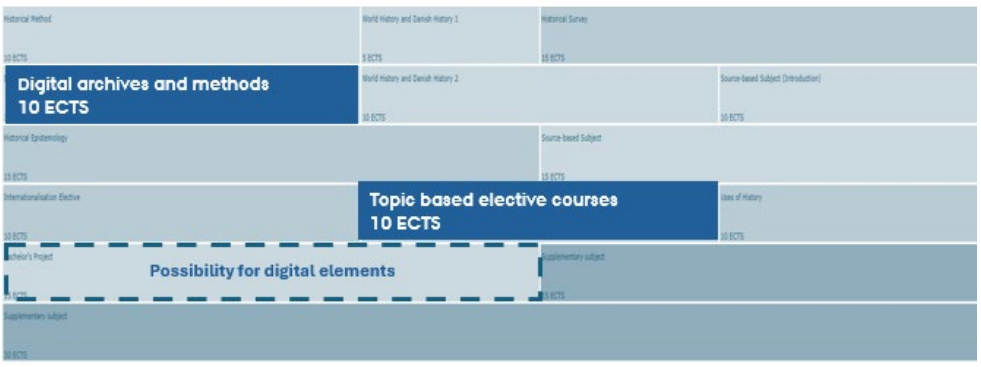
- Building a digital research group through strategic recruitment (Key initiative 1 in AU's overall digitalisation strategy)

- Development of a module on archives and digital methods, where students are introduced to digital methods and trained in understanding, accessing and using both analogue and digital archives. The module is integrated into the course element "Methodology and sources" (BA, 3rd semester)

Step 2: BA Academic Regulations 2023
Two independent course elements with a clear digital profile were developed:

- 'Digital Archives and Methods' (2nd semester) is a compulsory course element that ensures that all students acquire basic competencies in 'Digital History'. The aim of the course is: *'to introduce students to the collection, handling and analysis of historical data from digital archives [...] They learn to use appropriate web applications for analysing digital material, including transcription, annotation and analysis of historical text sources, and to identify appropriate research methods and software tools for working with both structured and unstructured data.'*
- Subject-based elective course with a digital element in the 4th semester, which enables particularly interested students to acquire a stronger profile in 'Digital History'. The current topic, 'Describe the history of marginalised groups', combines basic historical competencies and digital methods: *'The digitisation of new source groups and the emergence of new digital tools have now made it possible to reach out to the silent groups of history to an unprecedented degree. [...] The course introduces theoretical approaches such as experiential history, citizenship studies and life stories, combined with digital methods such as text mining and mapping.'*

It is also possible to incorporate digital topics and methods into the Bachelor's project. The digital curriculum for the bachelor's programme currently is currently as follows:



Step 3: MA Academic regulations 2024 and collective competency development

- Development of a new, compulsory course element worth 5 ECTS credits entitled 'Data Science for Historians'. The course element supports the desire for all candidates to acquire solid digital competencies and includes a clear progression from the Bachelor's programme by *'providing students with extended knowledge of how digital data is created and used in connection with historical analyses. Students will be able to understand the governing principles for (a) how data is collected and stored, (b) how data is managed and curated (production, systematisation, addition of metadata, data description, etc.), and (c) what these practices mean for the historical analyses that can be made on the basis of this data.*
- It is possible to incorporate digital topics and methods into the Master's thesis and other independent assignments. These are supported by a digital study café, where students can get help to work independently with digital methods.
- Starting in 2026, a series of subject-specific collective competency development activities will be launched within the subject area of 'Digital History'. The aim is not for all teaching staff to acquire teaching competencies in 'Digital History', but for everyone to have a basic understanding of the field, its contribution to the programmes and its potential relevance to their own research and teaching.

6.2/ BSS: Datalab – a shared digital support environment for students

 # Cross-curricular offer for students
 # Collaboration with resource persons on digital support

Contact: *Camilla Kølsen Pedersen*. Email: *ckp@mgmt.au.dk*.

Digital methods play a central role in many of BSS' degree programmes. In order to strengthen students' digital and data-processing competencies while creating a social and collaborative learning environment around data working with data, BSS developed BSS Datalab in collaboration with the Royal Danish Library.

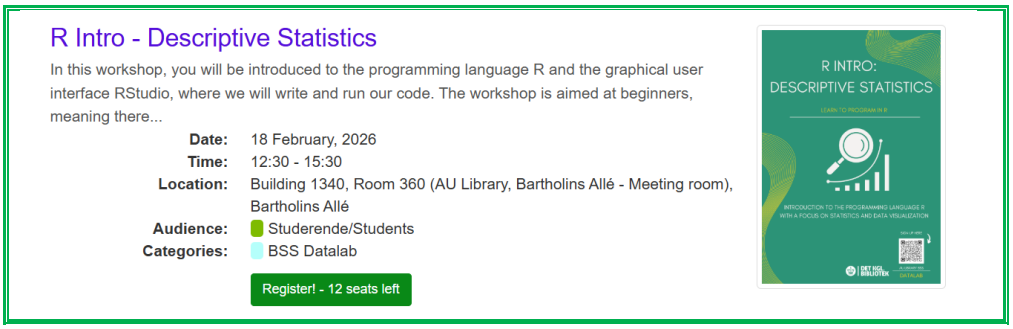
Link: BSS Datalab for students

BSS Datalab is a collaborative space where students can work with data and collaborate with each other and with the Royal Danish Library's data specialists.

The Lab is physically located at the library on Fuglesangs Allé and will be relocated to the new BSS campus in the University City. It is staffed by data experts who can help students with things like

- introduction to digital tools such as Excel, NVivo, R and Python
- extracting, cleaning and organising the students' own data
- provide guidance on how to use various analytical tools.

In addition, a number of courses are offered, most of which are open to both students and teachers, for example:

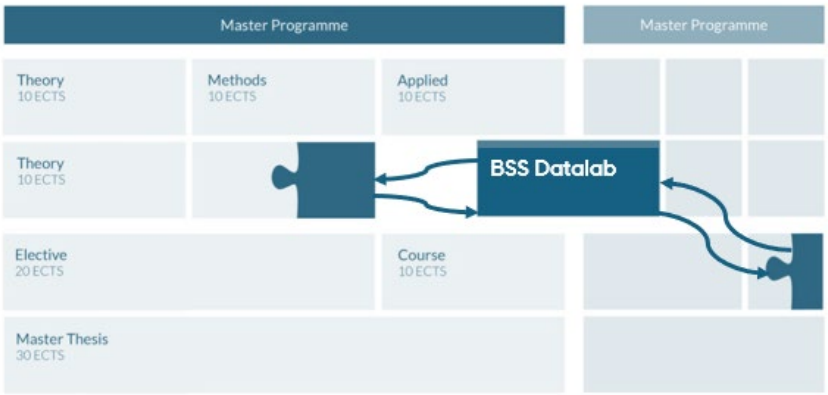


The development of BSS Datalab is based on a series of interviews with lecturers and directors of studies from the faculty's departments. The relevance of the BSS Datalab is emphasised by the positive feedback from the external panel in connection with the AACSB accreditation in autumn 2024.

BSS Datalab is intended as a supplement to teaching, so teaching staff can

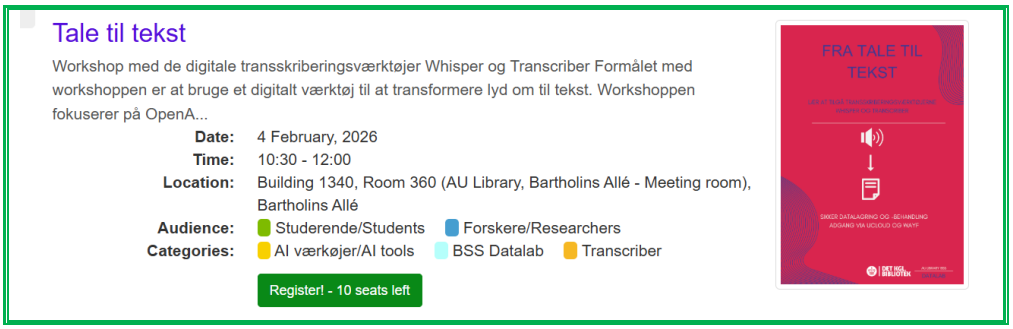
- involve BSS Datalab in their teaching
- refer students to open activities and courses
- work with staff to adapt BSS Datalab's existing offerings to their subjects.

In other words, this is a cross-curricular programme with a solid foundation in the course elements of the programmes.



The advantages of this approach are that it

- ensures a close link between the needs of the programmes and a highly specialised support environment
- creates a common framework for supporting digital competencies across individual course elements of a degree programme, minimising the challenge of students having to navigate different teachers' different approaches to the use of specific tools
- accommodates the heterogeneity of students' backgrounds and interests, as students have access to BSS Datalab's services outside of scheduled classes
- enables further digital specialisation and profiling through a combination of teaching support and student-oriented activities
- provides an academically relevant and easily accessible environment for the development of teaching staff competencies



6.3/ HE: A faculty signature for digital competencies in degree programmes

 # A faculty signature for digital competencies
 # Systematic work at three curriculum levels

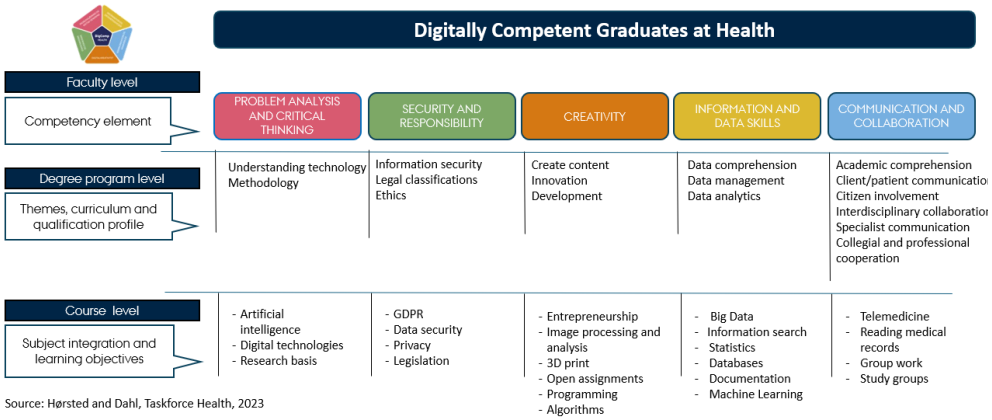
Contact: *Caroline Bindslev Hørsted*. Mail: *choersted@dent.au.dk*.

Following the Education Committee's decision that the EU framework 'DigComp 2.2 - The Digital Competence Framework for Citizens' could be a good common starting point for academic communities' discussions of the various dimensions of the digital competence profile of educational programmes, HE decided to set up a working group to operationalise the framework's five completely generic dimensions for digital competencies of particular relevance to the faculty's overall education portfolio, which in 2024 included the following programmes:

- Professional Bachelor's degree programme in dental hygiene
- Professional Bachelor's Degree in clinical dental technology
- Bachelor's and Master's degrees in public health
- Bachelor's and Master's degrees in sports science
- Bachelor's and Master's degrees in medicine
- Bachelor's and Master's degrees in dentistry
- The Master's degree programme in nursing
- The Master of clinical nursing programme
- Master's degree in health sciences
-

The Master's degree programme in optometry and visual science
The shared digital competency profile aims to ensure that going forward, the faculty's degree programmes address all the digital competencies that the cross-disciplinary working group has identified as essential, regardless of which health science programme the student graduates from. In this sense, the faculty's competency profile can be described as a common *signature* for all the faculty's programmes.

The shared Health model for digital competencies is shown below:



Source: Hørsted and Dahl, Taskforce Health, 2023

Within the framework of the model, work on digital competencies at HE took place on three levels, with the digital course objectives described in ascending order of specificity from faculty to course element level.

- Faculty level: Here the headings for the five dimensions of digital competencies from DigComp 2.2 were adjusted to better reflect the priorities set at faculty level.
- Degree programme level Within each competency dimension, a number of sub-dimensions were formulated which must be supported by all degree programmes.
- course element level: At this level, examples were formulated to provide inspiration for topics and activities to support the individual competency dimension. At this level, specific objectives for student competencies are formulated.

Below is an example from the curriculum for the 'Professional Bachelor's Degree Programme in Clinical Dental Technology' (2023) showing how a digital competency can be articulated at each of the three levels.

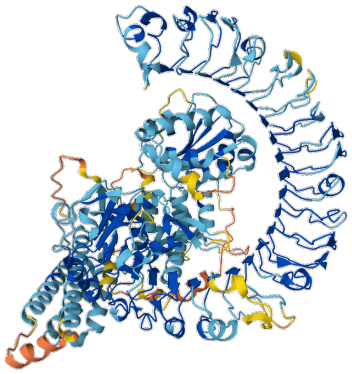
Level of description of digital competencies		
Faculty	**Competency profile of degree programme**	**Learning objectives in course element**
Security and responsibility	**Information security:** The student can describe the legal basis for professional practice as a clinical dental technician, including relevant regulations in the Danish Health Act and the Act on authorisation of healthcare professionals and healthcare activities	**1st semester, Professional training.** The student can explain the importance of rules regarding confidentiality and the GDPR (General Data Protection Regulation) and demonstrate knowledge about guidelines for professional behaviour at the university and the department

6.4/ NAT: Molecular biology – a field of study undergoing radical change

 # When technological developments transform research and education
#Research-integrated education

Contact: *Ditlev Brodersen*. Email: *deb@mbg.au.dk.*

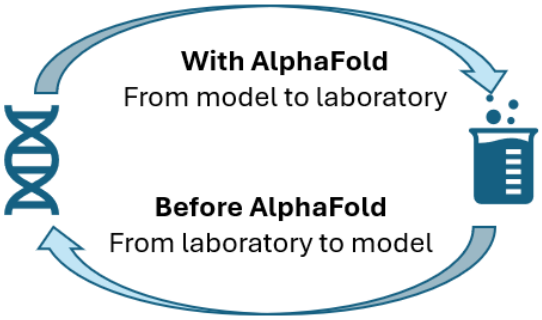
Research into molecular biology gained momentum in the 1950s with the discovery of the double helix structure of DNA and the analysis of the first 3D protein structures. Artificial intelligence is completely redefining how we approach research and is thus having an enormous impact on education. Both a much greater emphasis on students acquiring up-to-date digital competencies and on the teaching methods used in the new BA programme in Molecular Biology and Molecular Medicine (starting in 2025).



For decades, we have been striving to determine the molecular shapes of proteins using techniques such as X-ray crystallography and cryo-electron microscopy – often a long and laborious process. Then, in 2021, something remarkable happened: DeepMind announced AlphaFold, an LLM-based AI system that can predict a protein structure directly from its amino acid sequence in a matter of seconds. It was as if we suddenly had an atlas of the cell's machinery – but without the instruction manual. AI solved one of biochemistry's oldest problems – but immediately opened up a thousand new questions: How can we trust the model's prediction? What does an uncertainty of 0.8 mean? When do we still have to go to the laboratory?' (Professor Ditlev Brodersen, DKK closing day, AU, 18 November 2025).

AI-based tools can be integrated into the research process in many ways:

- Scientifically, because they provide opportunities to predict and visualise, for example, protein structures in completely new ways, which places new demands on the digital competencies of researchers, teachers and students alike. But when can we trust the model? And how do we ensure transparency in results and conclusions?
- In terms of time, insights that previously required months or, in some cases, years of laboratory work can now be modelled in a matter of minutes.
- Socially, by reversing the research process. Whereas models were previously the result of extensive theoretical and laboratory-based work, we now start with the model and ask biologically interesting questions from there. This changes roles, tasks and competency requirements in the research group.



In relation to the question of students' digital competencies in the field of AI, this means that:

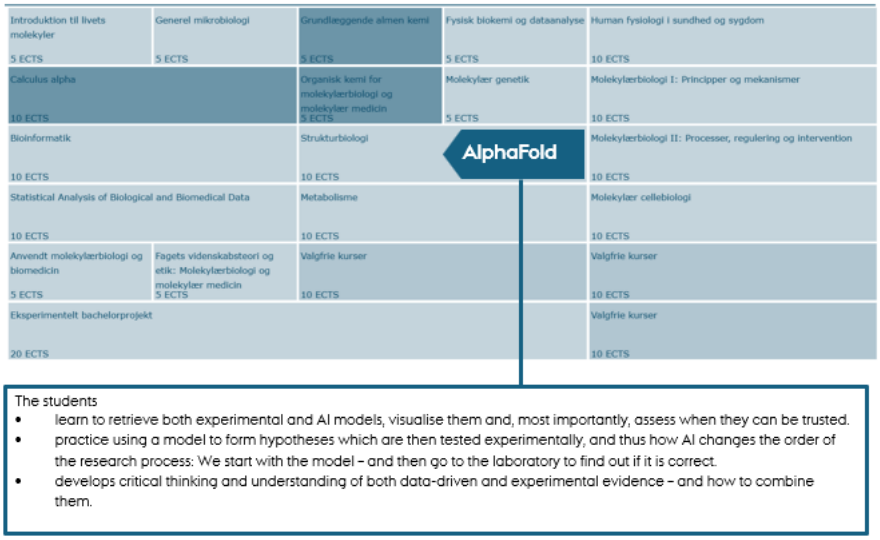
- All students should be familiar with and able to use AI at a level that reflects the level of research.
- We must not only teach students how to use AI, but also give them the theoretical and methodological grounding to critically assess AI results, e.g. knowing where bias may occur.

In the bachelor's programme in molecular biology and molecular medicine (2025), the importance of relevant digital competencies is reflected, for example, in a competency objective that states that the student *'can organise, analyse and visualise data using the relevant digital tools within bioinformatics and statistical analysis'*.

At the same time, it is difficult to identify a single aspect of the programme's overall competency profile that is not affected in some way by digital developments within AI. As a consequence, a system such as AlphaFold has a direct impact on several of the programme's competency objectives, e.g.

- Knowledge: *'can apply a wide range of methods for manipulating and analysing DNA, RNA, proteins and cells'*.
- Skills: *'can formulate hypotheses, design and conduct experiments, and interpret the resulting data within the fields of molecular biology and molecular medicine'*.
- Competencies: *'can critically evaluate relevant scientific literature, understand the significance and relevance of research results, and assess the quality and reliability of experimental data'*.

In the academic regulations, AlphaFold is integrated into the course element structural biology (3rd semester), among others.



6.5/ TECH: BSc and MSc animal science 2024 - Involvement of employers

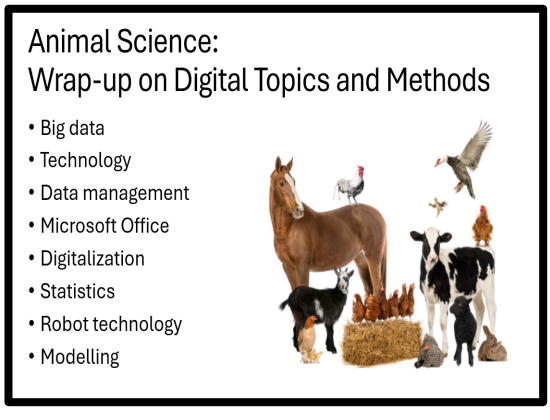
 # Involvement of employers in formulating the digital profile of the programme
 # Combination of curriculum models

Contact: *Tine Rousing.* Email: *tine.rousing@anivet.au.dk.*

When BSc and MSc in animal science were to be developed as completely new programmes in TECH's educational portfolio, digital competencies were a recurring theme in the dialogue with the employers.

Dialogue with employers also revealed an almost surprising correlation between what digital competencies employers wanted graduates to possess and the most essential research methods.

On this basis, a decision was made to prioritise work on 'Data Science in Animal Science' as the heading for the digital profile of both the BSc and MSc programmes in animal science.



This priority is reflected, among other things, in one of the skill objectives in the programme's competency profile, which states that upon completion of the BSc programme, students should be able to *'handle selected animals and perform basic laboratory procedures and participate in animal experiments in relation to feed, animal tissue and secretions, including using tools for data processing and statistical analysis of data'*.

Similarly, the recently approved BSc academic regulations require that Master's theses must contain data-based elements.

One of the first and most defining decisions for the development of the programme was the question of how the digital curriculum should be structured. Two models (see Figure 5) were considered, and the advantages and disadvantages of each were discussed:

- An integrated model in which the digital competencies taught on the BSc animal science programme are integrated into selected course elements.
- A distributed model in which they are supported by separate course elements.

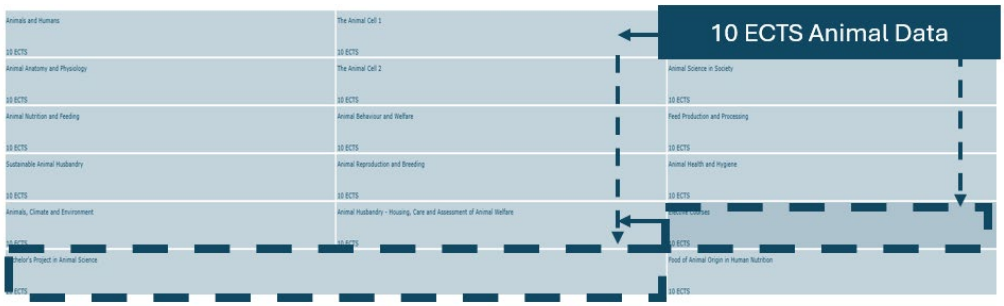
The main points from the discussions, which involved both the degree programme heads and course coordinators for the entire Bachelor's programme, as well as staff from 'Programme Development' at CED, are summarised below.

Integrated Curriculum - digital competencies embedded in other course elements
Possible benefits • Direct link between animal science issues and data/statistical methods, highlighting immediate relevance and applicability • Flexibility because digital methods can easily be adapted to changes in academic content Possible disadvantages • Digital technology is becoming an ad hoc tool and is less and less regarded as a core competency in animal science per se. • Risk of fragmentation in the students' learning process: they encounter many "data science elements" but may not gain an overview and understanding of the discipline's core methods and theories. • Coordination is required to ensure consistency and progression in the digital curriculum, because it is subject to the organisation of the other course elements. This makes it vulnerable to even minor changes in lesson plans.
Distributed curriculum – digital competencies as independent course elements
Possible benefits • Supports the development of data science competencies as an independent dimension of animal science expertise • Easier to create coherence and adjust content based on the students' learning process without interfering with other course elements – and thus requires less ongoing coordination. Possible disadvantages • The risk of the course element lacking integration with both the overall animal science competency profile and the individual course elements

Based on the discussions, the digital curriculum was based on a combination of distributed and integrated elements, where students' digital competencies are developed through:

- An independent course element, 'Animals and Data', in the first semester. All exercises in the course element are based on animal science-related topics.
- Specifically digital topics and/or methods are integrated into the project-based course element in all semesters (marked with P in the box diagram below), e.g.
- 'Animal Anatomy and Physiology' (2nd semester), where digital competencies are included in the learning objective *'Prepare oral presentations that meet the standards for scientific communication in animal science based on relevant data material and theoretical topics within the core areas of the course'.*
- 'Animal nutrition and requirements' (3rd semester), where digital competencies are included in the learning objective *'Use variance analysis for statistical evaluation of simple data sets and identification of outliers'*.
- Opportunity for further profiling through elective subjects
- The bachelor's project, where the learning objective *'Discuss the relevance and quality of the literature used, the theories/models used and any data, including experimental design and statistical methods'* explicitly highlights digital competencies.

The structure of the digital curriculum for the BSc in animal science is illustrated below.



7.0 Concluding remarks

As the third main initiative in AU's comprehensive and long-term digitalisation strategy, 'Digitally Competent Candidates' has focused on the digital development of academic regulations (Sub-initiatives 1 and 2) and the continued competency development of teaching staff (Sub-initiative 3), as well as extracurricular offerings for particularly interested students (Sub-initiative 4).

The faculty- and degree programme-specific approach has ensured immediate relevance and provided a deeper understanding of differences across faculties, while the cross-disciplinary discussions and coordination in the Education Committee have ensured the necessary synergy and experience sharing in relation to cross-disciplinary topics.

During the entire framework contract period

- an analysis of the digital development needs of 122 out of AU's 212 degree programmes – corresponding to 57% (target 40-50%) – was carried out, plans to address them were developed, and the first steps in implementing the plans were taken. For some programmes, the changes required are minor and can be implemented immediately, while for others, long-term efforts are necessary that involve building research capacity, further competency development in relation to subject-specific digital competencies, and curriculum development.
- 2309 teaching staff participated in formal competency development (target 400-500 teaching staff) focussing on both learning technology and subject-specific digital topics.
- a significant number of external grants were awarded to AU to support both subject-specific competency development and the development of the degree programmes' curricula.
- several extracurricular activities were developed and offered aimed at enabling particularly motivated students to acquire digital competencies.
- curriculum development was initiated across a wide range of the university's degree programmes.