23 The Netherlands

This note provides an overview of the Netherlands' digital education ecosystem, including the digital tools for system and institutional management and digital resources for teaching and learning that are publicly provided to schools and educational stakeholders. The note outlines how public responsibilities for the governance of digital education are divided and examines how the Netherlands supports the equitable and effective access to and use of digital technology and data in education. This includes through practices and policies on procurement, interoperability, data privacy and regulation, and digital competencies. Finally, the note discusses how the Netherlands engages in any initiatives, including with the EdTech sector, to drive innovation and research and development towards an effective digital ecosystem.

Key features

- In the Netherlands, the independence of educational institutions is a constitutional right. This means that the government does not intervene in the type of administration and management of schools, nor in the delivery of education programmes. The role of education ministry is focused on guiding schools in making responsible decisions with regards to the use of technologies. The only requirement is that schools must have some form of pupil tracking system.

- There is no centrally managed student information system, and the government does not publicly own, provide, or directly subsidise digital tools for school management (e.g. student admission system, learning management system). The government only offers school budget and guidelines to inform schools' decision-making. Schools are primarily responsible for choosing and providing access to appropriate and quality digital infrastructure and resources, and for organising and developing both teachers' and students' digital competence.

- Private companies have numerous opportunities to provide schools with their digital tools and resources, and public-private partnerships in the educator sector are common. This includes collaborations between schools and companies where some of these collaborations are supported by public programmes and initiatives funding EdTech companies. Given the wide range of digital infrastructure developed by different stakeholders in the education sector, a key area for improvement concerns the interoperability of technologies and the data they generate.

- Regulatory issues, such as the equity of access to digital technologies and protection of data and privacy, are governed by binding rules set at the national and EU levels. While the government monitors and evaluates the adherence of schools to these policies, schools themselves are responsible for ensuring equal access and data privacy protection. Little regulatory effort has been made so far regarding more advanced technologies, such as AI-powered tools, although some initiatives are in the pipeline to tackle their increasing use in education.

- The Dutch digital education strategy has long focused on ensuring and improving connectivity, especially for disadvantaged groups of students and schools. Connectivity will remain a strategic concern, in addition to upcoming areas, such as digital safety, digital literacy, safeguarding public values within the digital transition, and building a public value-driven digital government.

General policy context

In the Netherlands, freedom of education is a right guaranteed under the Article 23 of the Constitution. This freedom refers to the freedom of anyone to found schools, determine the principles on which they are based (be that religious, philosophical, or pedagogical) and organise teaching and curricula autonomously. Therefore, while the government sets (and checks) quality standards and overall educational objectives, there is *no specific national curriculum* offered or approved by the government. In this respect, the Netherlands is an exception internationally. Schools themselves are expected to be responsible for the nature of education they deliver.

Division of responsibility

This distinctive circumstance has shaped how the digital ecosystem for primary and secondary education is structured in the Netherlands. The role of the national Ministry of Education, Culture and Science (*Ministerie van Onderwijs, Cultuur en Wetenschap*) is limited to providing funding to schools and setting quality standards and overall attainment targets. As long as schools ensure the quality of education and meet the government-set targets, they have autonomy and (primary) responsibility to find and provide access to appropriate and quality digital infrastructure for education.

Though, this high level of autonomy of schools does not mean that the government plays no role. To help schools make well-informed decisions, various guidelines are provided by the ministry and Kennisnet, the ministry's public agency committed to ICT innovation, as well as by various cooperatives of schoolboards and councils at different levels of education.[1]

The decentralised administration and management, in conjunction with responsibility devolved to schools, suggests that private vendors have significant opportunity to offer privately developed digital tools and resources for education. The co-existence of various tools developed by different companies and organisations implies that the interoperability of technologies and data is a crucial issue in the country.

Digital education strategy

In 2019, jointly with other ministries and public agencies, the Ministry of Education, Culture and Science published an education-specific digital strategy: *Digitization Agenda for Primary and Secondary Education*. Many key points of this strategy, such as digital inclusion and accelerating educational innovations, have been updated and reflected in a more recently published nationwide digital strategy: *Dutch Digitalisation Strategy 2021*, leading to several changes in the government's digital education policies and expenditures.[2] This manifested in the efforts, *inter alia*, to improve broadband, Wi-Fi, and mobile coverages in schools. In 2020, for example, the Dutch government invested approximately EUR 24 million to provide 75 000 devices to students for their participation in remote learning (Dutch Digitalisation Strategy, 2021).[3] Extra funding was also provided to disadvantaged groups of students and schools, such as students with special educational needs and from low socio-economic backgrounds, as well as schools within low socio-economic or rural regions (although schools can decide whether they would rather use the funding for non-digital forms of support). Relevant guidelines about ensuring connectivity and organising remote learning were also provided by Kennisnet and SIVON – the cooperative of schoolboards for procuring educational resources.[4]

In terms of future priorities, enhancing connectivity will remain one of the ministry's priorities, especially for the regions where connectivity still constitutes an issue (e.g. the Caribbean part of the Netherlands). Yet, in the upcoming strategy, the government aims to pay greater attention to the issues of digital safety, digital competencies, and teacher autonomy, as well as safeguarding public values within the transition to digital education. The example of the latter includes the Kennisnet's publication of the Ethics Compass, which educators can use as a practical tool for raising ethical questions about digitalisation in education.[5]

The public digital education infrastructure

In terms of software, the government provides only few components of the digital education infrastructure to education providers. Given the substantial autonomy of the education providers, generally they choose and acquire themselves digital tools for school management, as well as digital resources for teaching and learning from the private sector or other education stakeholders.[6]

Digital ecosystem for system and school management

Student information systems and learning management systems

In the Netherlands, there is no centralised student information system that the ministry uses to directly manage students' personal information. Instead, one of the ministry's executive organs, the Education Implementation Service (*Dienst Uitvoering Onderwijs*; hereafter DUO), compiles the information it receives from schools. Schools are mandated under the Register of Education Participants Act (*Wet Register Onderwijsdeelnemers*) to provide their data to DUO, and they do so through a link between their student administration systems and one of the DUO's registers: the Register of Education Participants (*Register*

Onderwijsdeelnemers). DUO then uses the received information to calculate educational statistics and school funding, while the Inspectorate of Education (*Inspectie van het Onderwijs*), another public agency of the ministry, uses it to evaluate school performance.[7]

DUO's various registers store a variety of information received about schools, ranging from the courses they provide (Register of Institutions and Programmes; *Registratie Instellingen en Opleidingen*) and the enrolments of students from primary to higher education, to the results of schools' compulsory assessments in primary education (Register of Educational Participants). DUO uses the citizen service number ("Burgerservicenummer", or BSN) as unique and longitudinal student identifier for its information system.Some types of the data, such as school address, schoolboards, number of students and teachers as well as amount of funding, are made openly available on DUO's webpage.[8]

As it is mandatory for schools to provide the information about themselves and students, they use one of the Pupil Tracking Systems (*leerlingvolgsysteem*), which are equipped with at least the administrative functionalities of most learning management systems. These Pupil Tracking Systems (referred to as learning management systems in this report) are developed by private companies for schools to administer assessments, monitor students, and manage and organise their learning. Primary schools are obligated to use a Pupil Tracking System to keep track of the progress and results of the students, such as their test outcomes, assignments, socio-emotional development, etc.[9] While using a learning management system is technically not mandatory for secondary schools, most also use one. However, there is no direct government involvement in offering, procuring, or directly subsidising a learning management system. Schools can also choose which specific system they use.[10]

Administrative management and other support systems

DUO's interface entails several features of student admission system, digital credential system, and administrative function system, in the sense that students can access their personal page on DUO to check their exam results for upper secondary education and vocational education and training (VET), retrieve digital credentials for secondary education and VET, have their credentials verified, and enrol themselves in higher education and submit scholarship application. DUO is also in charge of providing student loans and school expense allowances, collecting tuition and student debts, and administering state exams annually in secondary schools. Nevertheless, it is not fully-fledged as a student admission or school administration system, since schools cannot use it directly to register or enrol students, or manage their budgets or schedule. It mainly records the result of all these actions. Schools thus independently choose and procure their own digital tools from private vendors and other educational stakeholders to manage administration and student learning (e.g. learning management system, administrative function system).

Digital ecosystem for teaching and learning

Kennisnet, the ministry's public agency on ICT innovation, runs *Wikiwijs* (meaning "Wikiwise"), an open wiki service designed to facilitate the creation and sharing of teaching materials.[11] There is also *Schools TV*, a public television channel run by the public broadcaster NTR, delivering educational contents for primary school students.[12] In addition, some government subsidies are used for procuring digital tools to support students with special educational needs or support organisations that do so.

Apart from these few cases, however, the ministry gives schools full autonomy to procure on their own and use the digital (and non-digital) teaching and learning resources. Although a vast majority of schools use a learning management system to help organise teaching and learning, as well as various digital resources including a distinctive use of intelligent tutoring systems for teaching Dutch language and maths, none of these tools and resources are publicly owned, procured or directly subsidised.[13] The role of the ministry is therefore limited in providing components of the digital ecosystem for teaching and learning.

Access, use and governance of digital technologies and data in education

Although the ministry does not own, procure, directly subsidise, or mandate the use of digital tools for school management or specific teaching and learning resources, it provides funding to schools and makes efforts to support education providers in acquiring and using digital tools and resources.

Ensuring access and supporting use

Equity of access

The Dutch government has undertaken several efforts to secure digital equity in education. In secondary education, schools are responsible for the access and delivery of the free (digital) learning resources to every student. The ministry also provides guidelines to help students equitably access and use digital technologies at all levels of education. Such effort is manifest in the initiatives like the Equal Opportunity Alliance (*Gelijke Kansen Alliantie*), which works with schools, municipalities, and other stakeholders in education to better understand what they would need to foster equitable education, and to promote equal opportunities for all students.[14]

However, there is no binding regulation as regards ensuring digital equity across schools. Schools are thus expected to deal by themselves with arranging digital access for students from lower socio-economic backgrounds. Only during the COVID-19 outbreak did the government exceptionally subsidise digital devices for students to help them access education, and implement measures to encourage disadvantaged or vulnerable students to return to school after the school closures (OECD, 2021[1]). The devolution of responsibilities to schools regarding digital infrastructure might lead to possible inequities across schools, such as an uneven access of hardware, and to disparities in access to learning materials between primary and secondary levels, where the former is not covered by binding rules.

Supporting the use of digital tools and resources

Given the decentralised structure and high educational autonomy of schools, the Dutch government does not involve itself much in ensuring access to digital tools for school management or digital resources for teaching and learning. Neither does it mandate the use of specific tools or resources, nor provide criteria for procuring digital education infrastructure. Yet, to support the use of various private tools and resources that schools may acquire, Kennisnet has developed a step-by-step school guide to choosing digital learning resources.[15] In addition, together with schoolboards, it has created a database called the *Catalogue Information Connection Point* (*Koppelpunt Catalogusinformatie*), which provides an overview of available (digital) learning resources.[16] Via Kennisnet, the Dutch government also monitors the level of digitalisation in schools.[17] Schools can also join the cooperatives of schoolboards like SIVON to exchange knowledge and expertise, collectively organise demand bundling, jointly purchase ICT facilities, and ensure favourable conditions in price-quality and range of ICT products and services for the schools.

Cultivating the digital competence of education stakeholders

As with many other aspects of education, the main responsibility to provide training for developing teachers' digital competences falls within the remits of each school and schoolboard. Compared to the European average, there is indeed a higher share of primary and lower secondary schools in the Netherlands that promote the use of digital technologies in teaching and learning, as well as teachers' relevant professional development (European Commission, 2019[2]). Conversely, the ministry does not have system-level policies directing teachers' digital training and development programmes. The initial teacher training in the country is also implemented by higher education institutions, which determine the contents of training programmes autonomously.

However, there are several (non-binding) initiatives to help cultivate the digital competences of teachers and students. In early 2022, the Dutch government initiated the *Masterplan Basic Competencies* – a programmatic intervention to enhance teachers and students' basic skills (reading, writing, arithmetic, and digital literacy) through an integrated and sustainable long-term programme. The focus of this programme is on, *inter alia*, teacher training, developing effective teaching methods and learning resources, and strengthening the connection between school and the environment.[18] As digital competence is increasingly considered an essential part of the foundational learning for teachers and students, the ongoing curriculum reform in primary and secondary education will develop learning objectives about digital skills and literacy. This is expected to be implemented from the school year 2024/25.

In addition, through the programme Impulse Open Learning Materials (*Impuls Open Leermateriaal*), the ministry aims to support teachers in effectively using and developing open learning resources, and to improve the public infrastructure for using those resources.[19] Also, albeit not specific to education, the ministry-funded initiative *Network Media Literacy* (*Netwerkmediawijsheid*), comprising over 1 000 organisations, is committed to fostering the (digital) media literacy of Dutch citizens.[20]

Governance of data and digital technologies in education

Supporting the use of digital technology and the data it generates can only work if stakeholders recognise that this use will not work to their detriment. As schools are themselves responsible for the procurement of digital technologies, part of the regulatory efforts concerns offering guidelines to support schools in making adequate decisions, protect the data and privacy of stakeholders, and ensure the interoperability of digital education ecosystem.

In education, as with other sectors in the Netherlands, data protection falls under the European Union's General Data Protection Regulation (EU GDPR), which has also been incorporated into the domestic law.[21] Schools bear the primary responsibility in handling the data and protecting privacy of students, teachers, and school staff, and so they must ensure that their suppliers comply with the EU GDPR. Schools are also held accountable in case of errors related to the use of digital technologies. Many schools have thus worked on their privacy policy, appointed a Data Protection Officer, and sought to raise privacy awareness among the staff. When individual schools are not capable of doing so (e.g. auditing every supplier), they can unite in the SIVON cooperative and collectively approach private vendors and request a proper protection of data and privacy. In this regard, the role of the ministry and public agencies like Kennisnet is limited to providing relevant guidelines to support schools. For example, guidelines about evaluating the effectiveness of digital technology for education, specifically safeguarding the data and privacy of students and teachers in the education sector, and facilitating data transfer between schools.[22]

It is notable that education data and privacy protection in the Netherlands is implemented also through public-private partnerships. In 2018, backed by the government, public and private parties in the education sector (e.g. learning management system providers, education publishers, Kennisnet, schools, etc.) joined forces to draw up a privacy covenant, in which they agreed on how to handle students' data generated and exchanged through digital tools and tests, in accordance with the EU GDPR. This covenant has now translated into the deployment of *ECK-iD* – a unique, sectoral, non-longitudinal (hence limited in time) and encrypted educational ID number assigned to students to protect their anonymity. All schools can use the *ECK-iD* when transferring data with digital tools for system and school management or for learning, and almost all of them do so.

Another key area of improvement in the country concerns the interoperability of technologies and the data they generate, given the co-existence of a broad spectrum of digital infrastructure developed by different companies and stakeholders. To tackle this, several public and private parties have joined forces to establish norms which all public and private parties should adhere.[23] Schools are responsible for complying with these norms, while the government and public agencies provide relevant guidelines to support

schools. For instance, Kennisnet offers guidelines about the use of open standards and interoperability, and encourages schools to use the tools with specific characteristics so as to improving interoperability between tools across Dutch schools and organisations.[24] Although the ministry does not conduct any inspection or random control to proactively enforce the rules governing the data and digital technology in education, its public organ, the Inspectorate of Education, oversees schools' adherence to policies, visiting every school once every four years or so, to ascertain whether schools (both public and private) meet the general targets and provide the expected quality of education.

No specific domestic policy effort is in place to regulate the (so far limited) use of automated decision-making and AI-based tools in the education sector. However, as AI-powered platforms have recently become more and more used in school teaching (e.g. the use of intelligent tutoring systems for teaching maths and Dutch language), the ministry and Kennisnet have embarked on related policies. Relatedly, Kennisnet published reports mapping out the opportunities and threats of AI for education, and the Acceleration Plan for Educational Innovation with IT.[25] The ministry also collaborates with the Ministry of Economic Affairs and Climate Policy to enable the National Education Lab AI (*Nationaal Onderwijslab AI*), financed by the National Growth Fund, to work on human-centred advanced digital educational innovations, including AI.[26]

Supporting innovation and research and development (R&D) in digital education

In respect of educational independence, the ministry does not directly commission universities to research specifically about particular themes of digital education. However, it communicated clear research and development priorities about digital education technology and the use of education data to encourage research in this field. Many universities have identified their own research agenda to coincide with the ministry's priorities, ranging from using digital technologies to improve learning outcomes, assessment and student engagement, to developing early warning systems and supporting teaching. Part of the regulatory efforts also lies in setting up rules to ensure that researchers and research institutions can equitably access educational data for R&D purposes.

In parallel, several public agencies carry out research on digital education, including Kennisnet and the Initiative for Education Research (*Nationaal Regieorgaan Onderwijsonderzoek*), a taskforce of the Dutch Research Council delivering a long-term programme for scientific research – many of which come with a digital focus.[27] In addition, the ministry subsidises *Dedicon*, a foundation that develops innovative tools for students with visual and reading disabilities.[28]

Other key drivers behind the digital innovation in education in the Netherlands are the vibrant public-private partnerships and collaborations across the government, public organisations, schools, and EdTech companies. The Dutch government is one of few OECD systems that invests directly in EdTech start-ups. Their Seed Capital scheme is funded by the Ministry of Economic Affairs and Climate Policy and administered by the Netherlands Enterprise Agency (*Rijksdienst voor Ondernemend Nederland*), providing capital for investment funds backing innovative entrepreneurs in the technology and creative sectors. CapitalT Seed B.V. is a case within the Seed Capital scheme, a venture capital fund investing in early-stage software start-ups including EdTech such as *Scoodle* (which is an online tutoring platform allowing students to connect with tutors across the world). In addition, besides the direct investment in start-ups, sometimes the government also provides competitive educational grants and other monetary incentives to promote the development of digital learning resources and educational software, and non-monetary incentives to promote collaboration between schools and EdTech companies.

References

European Commission (2019), *2nd survey of schools : ICT in education : objective 1 : benchmark progress in ICT in schools, final report*, Publications Office of the European Union, https://digital-strategy.ec.europa.eu/en/library/2nd-survey-schools-ict-education-0. [2]

OECD (2021), "Netherlands", in *Education at a Glance 2021: OECD Indicators*, OECD Publishing, Paris, https://doi.org/10.1787/5a37ecf5-en. [1]

Notes

[1] Kennisnet: https://www.kennisnet.nl/. The cooperative and councils include: SIVON (cooperative of schoolboards for procuring [digital] educational resources, https://sivon.nl/); PO-Raad (council for schoolboards in primary education, https://www.poraad.nl/); VO-Raad (council for schoolboards in secondary education, https://www.vo-raad.nl/); MBO-Raad (council for schoolboards in secondary VET, https://www.mboraad.nl/).

[2] https://www.nederlanddigitaal.nl/documenten/publicaties/2019/11/19/digitalisation-agenda-for-primary-and-secondary-education;

https://www.nederlanddigitaal.nl/documenten/publicaties/2021/06/22/the-dutch-digitalisation-strategy-2021-eng

[3] The devices were exceptionally distributed during the pandemic. Under the normal situation, schools themselves are responsible for ensuring the (digital) accessibility of their education.

[4] See, for instance, guidelines (https://www.lesopafstand.nl/lesopafstand/corona/draaiboeken/) and the General COVID-19 resilience plan for education (https://open.overheid.nl/documenten/ronl-ac5946d6c3245c238c16a8fcd53251fc2f923e8b/pdf)

[5] https://www.kennisnet.nl/artikel/11339/het-ethiekkompas-helpt-u-met-ethische-vraagstukken-over-digitalisering/

[6] A few companies (e.g., Google and Microsoft) provide some of these tools as 'freemium' models, i.e., providing some basic service free of charge, and charge for additional features.

[7] https://english.onderwijsinspectie.nl/

[8] https://duo.nl/open_onderwijsdata/

[9] https://www.rijksoverheid.nl/onderwerpen/basisonderwijs/vraag-en-antwoord/hoe-legt-de-basisschool-de-prestaties-van-mijn-kind-vast

[10] Examples of these systems are *Boom LVS*, *IEP-LVS*, *Dia-LVS* (in primary education); *Magister* and *Somtoday* (in secondary education).

https://www.boomtestonderwijs.nl/boomlvs; https://www.bureau-ice.nl/basisonderwijs/iep-leerlingvolgsysteem/; https://www.diatoetsen.nl/basisonderwijs/leerlingvolgsysteem-lvs/; https://www.magister.nl/; https://som.today/

[11] https://www.wikiwijs.nl/

[12] https://schooltv.nl/

[13] Examples include: *Gynzy, Muiswerk Educatief (Flexi), Prowise Learn (Rekentuin, Taalzee en Words&Birds), Snappet* and *Squla en ThiemeMeulenhoff (Got it)*.

[14] Equal Opportunity Alliance: https://www.gelijke-kansen.nl/

[15] https://www.kennisnet.nl/publicaties/stappenplan-voor-het-kiezen-van-nieuwe-digitale-leermiddelen/

[16] https://www.kennisnet.nl/diensten/koppelpunt-catalogusinformatie/

[17] Kennisnet is responsible for primary and secondary education as well as VET. For higher education, there is SURF, a cooperative association of Dutch educational and research institutions, and universities): https://www.surf.nl/. For monitoring and measuring the level of digitalisation, see the following links:

https://www.kennisnet.nl/app/uploads/kennisnet/publicatie/kennisnet-monitor-hybride-onderwijs-vo-1.pdf; https://www.kennisnet.nl/app/uploads/Kennisnet-ict-monitor-mbo-2021.pdf; https://www.kennisnet.nl/app/uploads/kennisnet/publicatie/vierinbalans/Vier-in-balans-monitor-2017-Kennisnet.pdf

The government also funds a website to provide information on remote learning: https://www.lesopafstand.nl/

[18] https://www.rijksoverheid.nl/documenten/kamerstukken/2022/05/12/kamerbrief-masterplan-basisvaardigheden

[19] https://www.openleermateriaal.nl/

[20] https://netwerkmediawijsheid.nl/

[21] https://wetten.overheid.nl/BWBR0040940/2021-07-01

[22] For instance, Kennisnet has an *Information Security and Privacy* (*informatiebeveiliging and privacy*) approach*,* which provides step-by-step plans and guidelines for good information security to minimise risks and protect privacy of citizens; SIVON provide guidelines for the schoolboards and schools that carry out Data Protection Impact Assessments; MBO Digitaal on the network information security and privacy.

[23] For instance, several councils in the education sector (PO-Raad, VO-Raad, MBO-Raad), the branch organisations of educational publishers (MEVW), distributers (KBb-e) and educational software developers (VDOD), as well as the Ministry of Education, Culture and Science.

[24] Kennisnet also provides guidelines on numerous topics related to schools, such as the use of education technology, digital testing, digital safety and data-usage and protection. For higher education, SURF is in charge. See the following guidelines as some examples:

https://www.kennisnet.nl/samenwerking/edustandaard/;
https://standaarden.surf.nl/index.php/Metadata_voor_interoperabiliteit_van_repositories;
https://www.kennisnet.nl/artikel/12352/waardenwijzer-in-gesprek-over-onderwijswaarden-en-digitalisering/

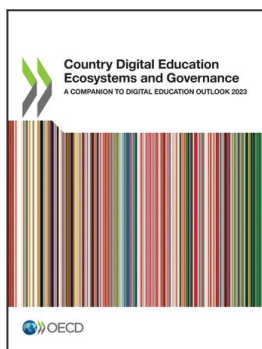[25] https://www.kennisnet.nl/app/uploads/kennisnet/publicatie/Kennisnet-Technology-Compass-2019-2020.pdf;

https://www.kennisnet.nl/app/uploads/Kennisnet-surf-value-compass-english.pdf;

https://www.versnellingsplan.nl/en/

[26] For the knowledge exchange platform, see: https://kennisopenbaarbestuur.nl/thema/artifici%C3%ABle-intelligentie-en-publieke-waarden. For the National Education Lab AI, see: https://www.nationaalgroeifonds.nl/projecten-ronde-1/nationaal-onderwijslab. The National Education Lab primarily consists of a public workplace environment where public and private parties work together on a project basis on advanced digital educational innovations (such as AI) that address important challenges in education.

[27] https://www.nwo.nl/en/netherlands-initiative-education-research-nro

[28] https://www.dedicon.nl/