# Informatics Education in Europe: *Are We All In The Same Boat?*

Association for Computing Machinery

INFORMATICS EUROPE

# Informatics Education in Europe: *Are We All In The Same Boat?*

*Report by*
**The Committee on European Computing Education (CECE)**

*Jointly established by*
**Informatics Europe** & **ACM Europe**

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# Table of Contents


Executive Summary: Recommendations & Findings ..... iv

1. Informatics—A Foundational Discipline ..... 5

2. Terminology ..... 8

3. Methodology for Data Collection and Validation ..... 11

4. Interpretation of the Data ..... 13

4.1 Informatics ..... 13

4.2 Digital Literacy ..... 18

4.3 Teacher Training ..... 20

5. Acknowledgements ..... 23

Appendices

A. About Informatics Europe and ACM Europe ..... 24

B. Selected Case Studies ..... 25

B.1 Recent Evolution of Informatics Education in Denmark ..... 25

B.2 Recent Evolution of Informatics Education in France ..... 26

C. Data Modes ..... 28

D. Country Fact Sheets ..... 83

# Executive Summary

This report describes the findings and recommendations of the Committee on European Computing Education (CECE), jointly established by ACM Europe and Informatics Europe to bring forward a detailed picture of the state of basic education in Informatics, Digital Literacy, and Teacher Training in these disciplines in Europe.

Similar to the "Running on Empty" study, which gathered data within the United States, this report presents a mapping across 55 administrative units (countries, nations, and regions) of Europe (including Israel) with autonomous educational systems. In this, it provides supplementary evidence for the recommendations of the previous report entitled "Informatics Education: Europe cannot afford to miss the boat"[1].

The data collected over the course of two years and the findings derived from an in-depth study include a description of recent policy and implementation changes, provide evidence of the need for such changes, and provide support for the recommendations that follow.

## Recommendations: Informatics

- All students must have access to ongoing education in Informatics in the school system. Informatics teaching should preferably start in primary school, and at the latest at the beginning of secondary school.
- Informatics courses must be recognised by each country's educational system as being on a par with courses in other STEM disciplines. In particular, they must be given the same credit, e.g. for STEM requirements.
- The teaching of Informatics must be undertaken only by teachers who have obtained a formal education and qualification in Informatics and appropriate methodological training.

## Recommendations: Digital Literacy

- Digital Literacy needs be taught from the early stages of education. However, it cannot be viewed as a substitute for the teaching of Informatics, the science enabling information technology, and must not be confused with it.
- Teaching of Digital Literacy should follow an agreed-upon, general curriculum that is periodically updated to reflect new developments in information technology. It should emphasise not only skills but also the principles and practices of using them effectively, safely, and ethically.
- Teaching of Digital Literacy should be undertaken with care and sensitivity by teachers who have undertaken appropriate training. For this, teacher training modules on Digital Literacy need to be developed and implemented.

## Recommendations: Teacher Training

- The vicious circle of a shortage of Informatics courses and Informatics teachers needs to be broken by training and hiring Informatics teachers even in times of budget shortages.
- The hiring of Informatics teachers must follow the same standards as for all other disciplines. In particular, neither formal requirements nor methodological training must be sacrificed.

1 Gander et al. (2013): Informatics education: Europe cannot afford to miss the boat, Report of the joint Informatics Europe & ACM Europe Working Group on Informatics Education.

The primary goal of this study is to provide country-by-country description of the state of affairs of education in Informatics, Digital Literacy, and Teacher Training in Europe. Given the widespread confusion as to the difference between Informatics and Digital Literacy, we also aimed at demonstrating the distinction between these two concepts.

Based on a study of qualitative data collected in more than 35 European countries (including Israel) and their education autonomous regions, this report provides a rich source of information about the state of education in Informatics and Digital Literacy as well as the important matter of teacher training in these disciplines. Using written questionnaires and personal connections we surveyed an extensive network of reliable contacts and national official sources in virtually all European countries. While complete coverage has been a challenge, in particular for countries where autonomous educational administrative regions exist, the report brings forward an unprecedented level of detail and information.

The emerging picture overall confirms that across Europe there is a growing realisation of the importance of offering young students the opportunity of sound education in Informatics, without which European countries will be compromising their effective role in our digital society. The level of effort and achievement in the relevant education varies a lot and depends on a number of interplaying complex factors, including social and economic development, the level of organisation and influence of the local teaching and academic Informatics community, and the influence of successful developments in the international community. Below we summarise the most relevant findings of this study.

## Findings: Informatics

- The evident lack of compulsory, or at least elective, Informatics courses in schools across Europe shows that Informatics is not regarded as being on par with other scientific disciplines.
- In several countries/regions, students can graduate from secondary schools without ever being exposed even to the basic principles of Informatics.

## Findings: Digital Literacy

- Digital Literacy is accepted as an educational subject across Europe. Teaching of this subject starts early, very often in primary schools.
- There are rarely stand-alone curricula for teacher training in Digital Literacy. Thus, there is the danger that the subject is taught by teachers who do not have the appropriate subject-matter knowledge.

## Findings: Teacher Training

- In general, provisions are in place to train Informatics teachers in the same way as teachers of any other discipline.
- In many European countries/regions, low-level re-training requirements, if any, for teaching Informatics undermine its recognition and adoption as a foundational discipline.

This report is complemented by an online interactive map (http://cece-map.informatics-europe. org) that provides a global view of the data collected and allows easier comparison across countries.

# 1. Informatics—A Foundational Discipline

Internationally there is a quite fast emerging breeze in the direction of making *Informatics* part of national curricula and part of the general education for all. This trend reflects the growing recognition that Informatics is an important foundational competence along with the three Rs: reading, writing, and arithmetic/mathematics.

In most European countries, the ambition is not yet as high as it ought to be considering the impact that the digital revolution has had on all aspects of society.

The European school systems are mostly concerned with *Digital Literacy* and *Information and Communication Technology* (ICT) as a supporting context-free medium/technology to enhance learning. Digital Literacy is of course necessary (for pupils and teachers alike), but it is far from sufficient. It is necessary for Europe to aim higher: to be a first-class player in the digital society.

**Terminology**

**Informatics** is a distinct scientific discipline, characterised by its own concepts, methods, body of knowledge, and open issues. It covers the foundations of computational structures, processes, artefacts and systems; and their software designs, their applications, and their imapct on society.

**Digital Literacy** covers fluency with standard software tools and the Internet.

These are brief definitions of Informatics and Digital Literacy. For more elaborate definitions, see the subsequent section on terminology.

Considering the current level of development and pervasiveness of technology in society, to offer new generations only the possibility of learning in school how to *use* technology, and not the skills and fundamentals to allow them *to create, control, and develop it further*, is not farsighted and sustainable. Certainly, pupils must learn how to use technology and how to act properly in the digital reality; however, it requires a far more comprehensive approach to form and educate the new generations to contribute to shaping the digital reality in which we increasingly live.

Informed, competent, critical, and reflected contributions can only be achieved by rooting the entire educational system upon the scientific basis of information technology—Informatics—and how it impacts society.

Informatics is a complex discipline; it has existed for around 75 years and is about conceiving, designing, and understanding computational structures, information processes, and systems in the broadest sense of these terms.

In the 21st century, it is remiss not to thoroughly embrace and include the discipline of Informatics in school curricula. This is not a trivial task, but it can be achieved with the right policies and contribution from the scientific and education community.

## Background

The digital technologies that have seen the light of day in the past 25-50 years (e.g. the personal computer, the internet, and the world-wide web) were only the beginning of a profound transformation in our society. In the next 15-20 years, we will see dramatic changes that will challenge and impact all professions[2], scientific disciplines[3], and school subjects[4]. We must carefully pave the way to this future, properly educating the current and future generation of students and citizens.

Digital technologies are not "just another technology" like the steam engine, the telegraph, the aeroplane, and penicillin. All other technologies invented by mankind, are technologies that stretch physical abilities. Digital technology and its scientific basis, Informatics, radically challenge the way we think about, understand, and organise the World. The impact on society is pervasive and profound, e.g. politically, economically, legally, medically, scientifically, and educationally.

Therefore, it is of profound importance that Informatics becomes part of general education so that all children are educated to become critical, competent and reflective citizens who can contribute in the broadest sense to shaping the future of our society.

The foundational principles of Informatics and its characteristic ways of shaping thinking, expression, and work are more important for education than its specific technologies. There are several reasons why we should be cautious about focusing too heavily on technologies:

1. General education must focus on foundational formation and long-lasting knowledge and competencies.

2. As much as astronomy is about telescopes and surgery is about lancets, so Informatics is much more profound than specific technologies that on the surface are ever changing and thus hard to get a hold on.

3. Excessive focus on concrete technologies would create a subject and a school culture involving an inherent (superficial and expensive) technological race which is impossible to win and that only would create frustration

2 Schwab, K. (2015): The Fourth Industrial Revolution. Portfolio Penguin.

3 Emmott, S. et al. (2005): "Towards 2020 Science", Microsoft Research.

4 Académie des Sciences (2013): "L'enseignement de l'Informatique en France: Il est urgent de ne plus attendre".

and a sense of insufficiency among teachers, students, and parents.

## Radical New Opportunities

It is undeniable that modern technologies must play a significant role in education, but as a means, not as the goal. Thus, there is something much more important and more principled at stake, namely the radical new opportunities that Informatics provides in the form of a paradigm shift with respect to understanding, expression, and socially/network-wise.

### *Understanding*

Informatics provides the scientist's workbench of the 21st century. Via digital dynamic models we can realise, analyse, and reflect about the world—in short: conceive and model the world. Informatics provides radical new ways of realising the world.

### *Expression*

Informatics is the 21st century's means of expression. Via numerous digital tools (including programming and modelling tools) we can use computational processes and systems to build dynamic simulations instead of just writing analogue, static descriptions. We can create generative rather than merely representational expressions.

Informatics provides radical new ways of expressing ourselves, since we are not limited by what can exist or is built in the physical world, as in natural sciences and engineering. Informatics creates its own virtual worlds limited only by our imagination and creativity.

### *Socially/network-wise*

Neither physical nor political nor organisational boundaries are obstacles in Informatics. With Informatics, geographical and temporal distances are eliminated and our traditional understanding of personal and work-based communities are challenged and altered. Informatics provides radical new challenges and opportunities socially as well as network-wise.

But we must pursue these new radical opportunities; they do not just exist.

## Control or Be Controlled

In a not too distant past, only very few people knew how to read and write. When more learned to read, it was still the case that only a few people had access to the writings of the time. Consequently, the power in society was controlled by very few institutions, which generally did everything to maintain and expand their power by suppressing and exploiting ordinary people.

We have come a long way since the dark middle ages, and within the past 100–200 years, the majority of mankind has learned to read and write. Nobody doubts the importance of this for a more human, democratic, and fair development of society. Paradoxically, we nowadays run the risk that information technology itself will create a new dark age, namely if only a few "high priests" will have the power of the science and technology that increasingly defines the reality in which we all live.

Informatics (and its derived technologies) is the control panel to civilisation and we all have a simple choice: we can control or be controlled. The phrasing "control or be controlled" may seem somewhat dramatic and categorical; Douglas Rushkoff, who wrote the seminal book "Program or Be Programmed", elaborates on this in the short video introduction to his book.

## Informatics– A Unique Intellectual Challenge

Let us finish this introduction by quoting one of the grand pioneers of Informatics, Edsger Dijkstra; in 1972—45 years ago—he closed his Turing Award Lecture (the Nobel Prize of Informatics) as follows[5]:

"Automatic computers have now been with us for a quarter of a century [now 70 years]. They have had a great impact on our society in their capacity of tools, but in that capacity, their influence will be but a ripple on the surface of our culture, compared with the much more profound influence they will have in their capacity of intellectual challenge without precedent in the cultural history of Mankind. […] This challenge, viz. the confrontation with the programming task, is so unique that this novel experience can teach us a lot about ourselves. It should deepen our understanding of the process of design and creation, it should give us better control over the task of organizing our thoughts. If it did not do so, to my taste we should not deserve the computer at all!"

5 Dijkstra, E.W. (1972): "The Humble Programmer", Communications of the ACM 15(10):859–866.

# 2. Terminology

In this section, we provide clear definitions of the terms used throughout the report; when necessary we also provide commentary on any ambiguity in their more general uses.

An inherent challenge of complex knowledge systems is the definition of a universally accepted and adopted terminology. For Informatics, a relatively young science, this is still a fundamental problem, making it difficult to convey a clear message to society as a whole about the relevance and impact of the discipline. It also makes particularly difficult the creation of well informed, sound policies. Currently, a broad range of terms is used both for defining the academic discipline as well as its applications and ramifications. Terms with different meanings are used in different contexts by different communities. For Europe, additional complexity is added when considering the numerous national languages and the history and development of the field in each country.

Information Technology (IT) is the term used by the general public to describe the domain we are addressing, but it is also a broad and ambiguous term; even in the specific context of education, it is highly ambiguous. Different stakeholders, policy makers, school managers, educators, pupils, parents, and the general public may have different interpretations. Some of the more prevailing interpretations are:

- Infrastructure and technology such as the Internet and computer equipment (PCs, tablets, 3D printers, etc.).
- Digitalisation of workflow in educational institutions among all involved parties (public stakeholders, management, administration, teachers, pupils, and parents).
- Learning management systems to facilitate efficient learning, evaluation, and assessment processes.
- Instructional technology that facilitates learning of specific skills, e.g. reading and arithmetic.
- Practical and operational knowledge and skills about how computers, operating systems, standard software and networks operate.
- Basic user skills, i.e. fluency with standard IT tools such as word processors, web browsers, spreadsheets, etc.
- Knowledge and competencies about computational structures, processes, artefacts and systems.

The ambiguity of IT in education is a fundamental problem. It is supplemented by an abundance of additional terminology, e.g. Computer Science, Computing, Computational Thinking, Digital Literacy, Digital Skills, Informatics, Instructional Technology, and ICT. Consequently, terms are often misused and misinterpreted by players in and around the field.

In this report, we refer to two general terms:

**Informatics:** knowledge and competencies about computational structures, processes, artefacts, and systems.

**Digital Literacy:** basic user skills, i.e. fluency with standard tools such as word processors, web browsers, spreadsheets, etc.

Even for these two terms, the distinction is not always clear; however, the differences are fundamental and need to be carefully understood. One of the main goals of this study and report is to clarify and describe the differences between Informatics and Digital Literacy, particularly in the context of education.

## Informatics

The characterisation of Informatics (also known as computing or computer science) has developed significantly over the past 50 years or so. While natural sciences are defined with reference to the world in which we live, Informatics as a scientific discipline is harder to define; it does not have the empirical foundations of the natural sciences; it is more than symbolic reasoning as in mathematics; and it is far from just being a compilation of engineering principles and technology. For these reasons, we speak of describing the discipline and not defining it.

Several distinguished scientists have provided characterisations of the discipline of Informatics; we present here three complementary characterisations:

- Nygaard (1986)[6] used the term 'Informatics' to underline the importance of conceptual modelling and to convey that information systems are "networks of people, information processing equipment and other machinery, interacting through direct inter-human and (an increasing proportion of) electronically supported communication links".

6 Nygaard, K. (1986): Program Development as a Social Activity, In Proceedings of the IFIP 10th World Computer Congress, INFORMATION PROCESSING 86, Dublin Elsevier Science Publishers, pp. 189-198.

- Harel (1987)[7] in his book "Algorithmics: the Spirit of Computing", describes the discipline as covering three complexities: computational complexity; behavioural complexity; cognitive complexity.
- Denning and Rosenbloom (2009)[8] describe computing as a fourth great domain of science alongside the physical, life and social sciences.

What we would like to emphasise in this report is that Informatics is not a sub-discipline of Mathematics or any of the other scientific disciplines or domains; Informatics is a distinct scientific discipline, characterised by its own concepts, methods, body of knowledge and open issues. It covers the foundations of computational structures, processes, artefacts and systems; and their software designs, their applications, and their impact on society.

Informatics is a discipline encompassing fundamental concepts and practices such as:

- Data, information, and representation
- Algorithms and programming
- Patterns and parameterisation
- Abstraction and conceptual modelling
- Devices, network, and the web
- Computation and communication
- Design and interaction
- Security, privacy, and ethics
- Societal impact

## Digital Literacy

Based on reports from UK[9] and Europe[10], we use the following description of Digital Literacy:

Digital Literacy encompasses applied basic practical skills every citizen should be familiar with, to live in the 21st century. Digital Literacy covers fluency with standard software tools and the Internet.

In the context of education, it is expected that after being exposed to this area early in schools, one should be able to:

- Select and effectively use standard software, e.g. word processors, presenter tools, web browsers, and spreadsheets (act, process, and communicate with these tools);
- Critically retrieve and filter digital information;
- Evaluate ordinary user aspects of digital security, privacy, and credibility.

In this report, we refer to Informatics and Digital Literacy in the context of education. We collected data from different European countries regarding the status of Informatics and Digital Literacy in the national schoolsystems.

In the questionnaire from which data was gathered, we used a shorter description of Informatics and Digital Literacy, the same given in the recent Informatics Europe/ACM Europe report "Informatics education: Europe cannot afford to miss the boat"[10]:

> **Informatics** covers the science behind information technology. Informatics is a distinct science, characterised by its own concepts, methods, body of knowledge, and open issues.
>
> **Digital Literacy** covers fluency with computer tools and the Internet.

In the next sections we present our study in more detail, including the methodology used to collect the data, the data collected, and a brief factual interpretation of the findings.

7 Harel, D. (1987): Algorithmics – The Spirit of Computing, Addison-Wesley.

8 Denning, P.J. and Rosenbloom, P.S. (2009): The Profession of IT – Computing: The Fourth Great Domain of Science, Communications of the ACM, Vol. 52 (9), pp. 27-29.

9 The Royal Society (2012): Shut down or restart? — The way forward for computing in UK schools. The Royal Society.

10 Gander et al. (2013): Informatics education: Europe cannot afford to miss the boat, Report of the joint Informatics Europe & ACM Europe Working Group on Informatics Education.

# 3. Methodology for Data Collection and Validation

The initial step for data collection was a thorough analysis of the papers published in the two special issues of ACM Transactions on Education featuring "Computing Education in (K-12) Schools"[11]. Through personal contact with the associate editor responsible for these two issues, CECE established contact with all European researchers who had submitted papers reporting on the status of Informatics education in schools in their countries. All lead authors of these reports formed the initial core set of contacts for our data collection. This set was expanded by contacts from the professional networks of CECE members and through active networking at conferences such as ICER, WiPSCE, ISSEP, and ECSS, and meetings held at the Lorentz Center and Schloss Dagstuhl.

In the fall of 2014, a first questionnaire was sent out to 34 contacts in 23 European countries. This questionnaire focused on understanding the national standards and the level of implementation of both Digital Literacy and Informatics in the national curricula. Furthermore, the questionnaire solicited reports on best practices and lessons learned. To broaden the geographic coverage of the report, CECE continuously tried to solicit the participation of academics from the remaining European countries. In total, 68 contacts from 55 European countries and regions[12] contributed to the data presented in this report.

Reflecting the information gathered through these questionnaires, a data model for the data presented in this report was developed. Based upon this model, a collaborative web-based interactive map was produced. This platform was shared with all contacts with the goal of validating the correctness of the data entered and adding new or updated information where needed.

At the end of 2015, this first phase of data entry validation was completed. Subsequently, access to the map was opened to members of ACM Europe and Informatics Europe. To ensure completeness and accuracy of the data reported for each country, the members of ACM Europe and Informatics Europe were asked to cross-validate the information present in the database and to use the platform or e-mail to provide feedback.

In parallel with this semi-public validation phase, a second questionnaire was sent to all established contacts. In this questionnaire, CECE followed up on certain aspects of the first questionnaire and expanded the scope of the data collection to include the availability of Informatics courses as well as to gather information about teacher training in Informatics. Again, the collaborative web-based platform was used to collect and enter the data as well as to provide feedback. Wherever possible, official documents were consulted to ensure the accuracy of the data to the best of the committee's knowledge. However, as official documents are usually written in the local language, the committee occasionally had to rely on the contacts' responses only.

While every effort was made to ensure the accuracy and consistency of the data collected, updated educational policies or legislative changes may affect the accuracy of the data in the future. To alleviate this, the interactive web map (http://cece-map.informatics-europe.org) can be used to file reports and to suggest updates.

Although extreme care has been taken to ensure the data of interest was correctly extracted from the questionnaires, the people we surveyed, and other sources, we cannot completely guarantee the accuracy, reliability, completeness of this information. As usual with such reports, conclusions drawn from the information provided in this report and further use of the data should be viewed with caution.

11 ACM Transactions on Computing Education (TOCE), Special Issues on Computing Education in (K-12) Schools, Part I: TOCE 14:2 (June 2014) [http://dl.acm.org/citation.cfm?id=2767124], Part II: TOCE 15:2 (May 2015) [http://dl.acm.org/citation.cfm?id=2767124]

12 Throughout the report, we consider administrative units that have autonomous educational systems. Depending on the country, this can be the country itself, e.g. Denmark, a nation, e.g. Scotland, or a federal state, e.g. Bavaria.

# 4. Interpretation of the Data

With this study, we aim at providing a broader picture of the current status and developments around the major challenge of introducing and establishing Informatics as a school subject in Europe. Our approach to reach this goal was to liaise with and survey contacts in the various European countries who have a sound knowledge and understanding of their national educational system, many of whom are deeply engaged in the discussions and efforts to tackle this major educational challenge in their own countries. It is important to note that for the purposes of this report we considered a broader view of Europe, including almost all the countries of the continent and not just the member countries of the European Union (see list of collaborators in the Appendix).

In this section, we provide a synthesis of the data collected in an attempt to bring forward an emerging global picture of the European landscape regarding the status of Informatics education in schools. Following the general structure of the detailed surveys and the data collected (see previous section), three broad domains are identified: Informatics, Digital Literacy and Teacher Training. Within each domain, we summarise the results emerging from the more specific questions featured in the surveys, called here *data modes*. All details, including geographical coverage, questions applied and country specific results can be fully explored in the Appendix.

## 4.1 Informatics

The report *Informatics education: Europe cannot afford to miss the boat*[13] recommends that "all students should benefit from education in Informatics as an independent scientific subject, studied both for its intrinsic intellectual and educational value and for its applications to other disciplines".

When considering the impact that the digital revolution has had on all aspects of society it would be natural to expect Informatics to be taught at least at the secondary school level, though elements of the foundations of Informatics could be taught at a much earlier stage. Of course, finding a place for Informatics in the school curriculum is often problematic since it requires to find smart and sustainable solutions for including a new foundational discipline among historically firmly established subjects in a system that in most countries already works at its maximal capacity. Deep structural changes, and possibly a rethinking of the entire educational system might be required, making this a non-trivial problem for education policy makers and the teaching community. Other factors also play an important role, such as the perceived importance of Informatics to society and the availability of properly qualified teachers.

As a community, we have followed with great interest the developments in England, where a strong grassroots movement, including academics, teachers, parents and supported by key policy makers[14], was able to promote fundamental changes and implement policies to establish Computing as a foundational discipline in schools from an early stage[15]. Due to the level of effort and achievement, the UK experience has reached public awareness and has been communicated broadly in both specialised and general media. The developments in most European countries are not as widely communicated and even in specialised forums and communities, there is a lack of knowledge of what exactly is happening in terms of educational policy and practices across Europe regarding Informatics teaching.

An important goal of this report is to contribute on bringing awareness of the current state of affairs to a higher number of European countries. With that in mind, we hope to expand our take on the problem and have a glimpse of the different levels of development and successful actions. By surveying colleagues from different European countries, we aimed at learning when Informatics, if at all present, is first introduced in the schooling system; what are the de facto opportunities students have for properly learning the subject; and what is the situation regarding the preparation of teachers of the subject. A non-in-depth understanding of the policy landscape regarding curricula and education policies was also sought. The results are summarised and interpreted below. A detailed breakdown of the data by mode and region is given in the Appendix.

Note that there is some variation in the total number of countries that provided the data in each specific data mode. In a few cases not all questions were, or could be, properly answered by our national contacts. Hence, the numbers of data points range between 38 and 55 depending on the data mode. Figure 1 shows for which countries/regions of Europe data has been available. In the case of autonomous

13 Gander et al. (2013): Informatics education: Europe cannot afford to miss the boat, Report of the joint Informatics Europe & ACM Europe Working Group on Informatics Education.

14 The Royal Society (2012): Shut down or restart? — The way forward for computing in UK schools. The Royal Society.

15 https://www.gov.uk/government/publications/national-curriculum-in-england-computing-programmes-of-study

regions or states, these are treated separately. Currently, this is the case for the nations of the United Kingdom, the regions of Belgium, the states of Germany, and the autonomous regions of Spain.

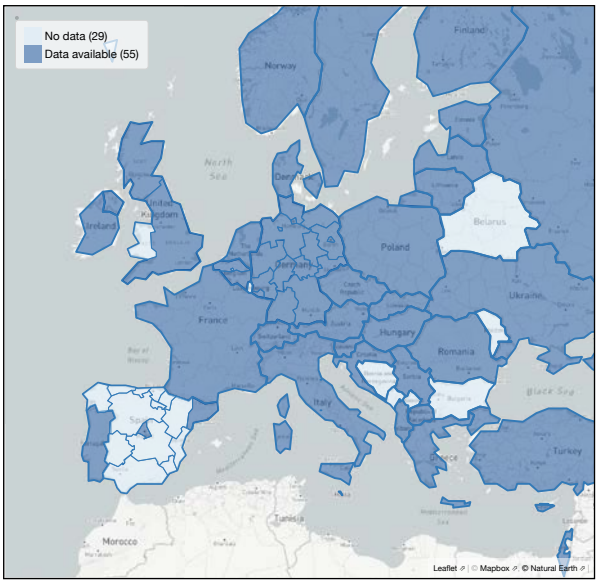


*Figure 1. Availability of Data*

Within the limits of the project, the group was unable to gather data for Andorra, Bosnia and Herzegovina, the Brussels region of Belgium, Bulgaria, the No Mans Area of Cyprus, the Faroe Islands, Kosovo, Liechtenstein, Luxembourg, Moldova, Monaco, Montenegro, San Marino, all regions of Spain with the exception of Catalonia and Madrid, Wales in the UK, and the Vatican.

### *Informatics: First Contact*

The data shows that in a small number of countries, elements of Informatics are introduced already in primary schools, namely in Croatia, Slovenia, the Ukraine, and all the countries of the UK (therefore 6 out of 53 countries/regions included in this data mode, i.e. 12%). After primary school, there is a split between places introducing Informatics at lower secondary level (27 out of 53 countries/regions; 50%) and those introducing it at higher secondary level (20 out of 53 countries/regions; 38%).

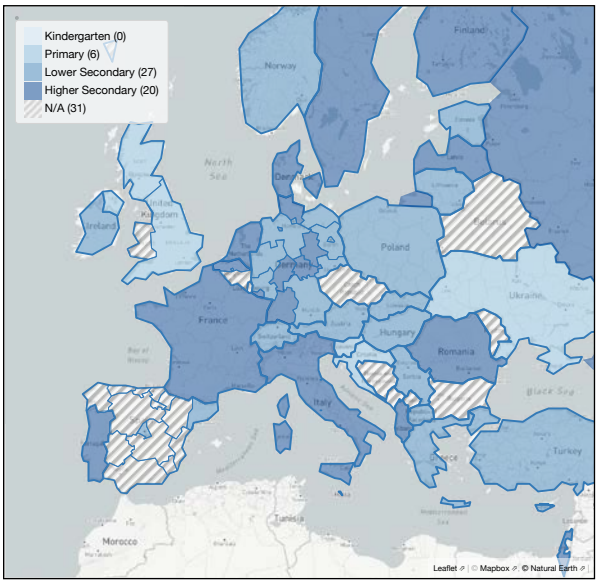


*Figure 2. Informatics: First Contact*

This reflects a considerable variety of views across Europe about the foundational and fundamental importance of Informatics as a discipline; generally it is not seen as sufficiently important that the associated thinking is being embedded in the minds of pupils from an early age. Given the wealth of research on how to teach Informatics in (lower) secondary schools or even earlier and the status of Informatics in teacher training almost everywhere (see Section 4.3), there is not a sound justification for only offering Informatics courses at the latter stages of secondary school.

The interpretation of the data acquired for this data mode, which does not distinguish between optional, elective, or compulsory courses, should be combined with the interpretation of the data acquired for the next mode. For example, looking at Denmark and France, the two countries for which we include case studies (see Appendix B), one can see that pupils in both countries may have their first contact with Informatics in higher secondary school. However, the responses in the data mode discussed below show a significant difference: while each Danish pupil has the opportunity to take Informatics classes in higher secondary school, in France, this is the case only for pupils attending certain types of schools; see Appendix B for more details.

### *Informatics: Availability of Courses*

The availability of Informatics courses is very patchy across Europe, with strongly varying opportunities for pupils to study this subject. In a large number of countries/regions, Informatics courses are available to all students (22 out of 50 countries/regions; 44%). However, in many countries/regions, Informatics is available only to a subset of students (10 out of 50 countries/regions; 20%). These two categories make up most of the countries/regions for which data was collected. In eight countries and three states in Germany, the study of Informatics is compulsory for a varying number of years (11 out of 50 countries/regions; 22%). At the other extreme, Sweden, Finland, and the Walloon region of Belgium do not offer any Informatics teaching at all (3 out of 50 countries/regions; 6%).

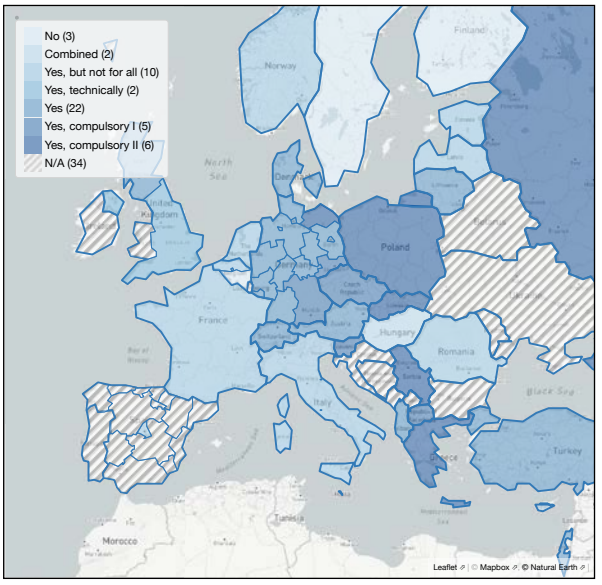


*Figure 3. Informatics: Availability of Courses*

An attempt was made to determine the uptake of Informatics courses when students were free to make a choice and select Informatics from a list of classes. Gathering such information proved to be problematic; the small amount of evidence available was not encouraging.

The overall picture across Europe on the availability and uptake of courses is somewhat depressing. In contrast to other subjects, e.g. Mathematics, Informatics is not offered to the full student population. In many countries/regions, students can graduate from secondary schools without having ever been exposed to Informatics. As a consequence, students do not even have a choice to decide for themselves whether or not to pursue Informatics as a subject of study. It appears that Informatics as part of general education is not held in sufficiently high regard by important stakeholders and policymakers and this is "harming [Europe's] new generation of citizens, educationally and economically"[16].

To follow up on this, we asked our contacts to provide us with a breakdown by grade. We were interested to see in which grade(s), if any, Informatics courses were offered and whether they were compulsory or not. For courses that are not compulsory, we asked our contacts to indicate whether these were elective courses, i.e. could be chosen from a set of courses needed to fulfil a certain requirement, or optional courses, i.e. not suited to fulfil any requirements.

This follow-up study gathered data from 47 countries/regions and the results are depicted on the next page. There are three main findings: first, only in a very small number of countries, is Informatics offered in lower secondary education or even primary schools—be it only as an optional or elective subject; second, where Informatics is offered in higher secondary schools, it is usually offered as an elective course; third, there is only a handful of countries/regions in which Informatics can be studied throughout (almost) all of secondary school. Given the optional nature of many such offerings, elective courses in higher secondary school often need to "go back to the roots" since it cannot be assumed that all pupils have previously attended Informatics courses.

### *Informatics: Curriculum Consistency*

Generally, the curricula tend to be defined nationally (or at state level, where states have autonomy for education policy); this reflects the recognition of Informatics being a distinct discipline in these places (49 out of 54 countries/regions; 90%). In a small number of cases the definition of the curriculum is left to schools, these being the Flemish speaking region of Belgium, Estonia, Finland, Ireland, and Sweden (5 out of 54 countries/regions; 10%).

16 Gander et al. (2013): Informatics education: Europe cannot afford to miss the boat, Report of the joint Informatics Europe & ACM Europe Working Group on Informatics Education.

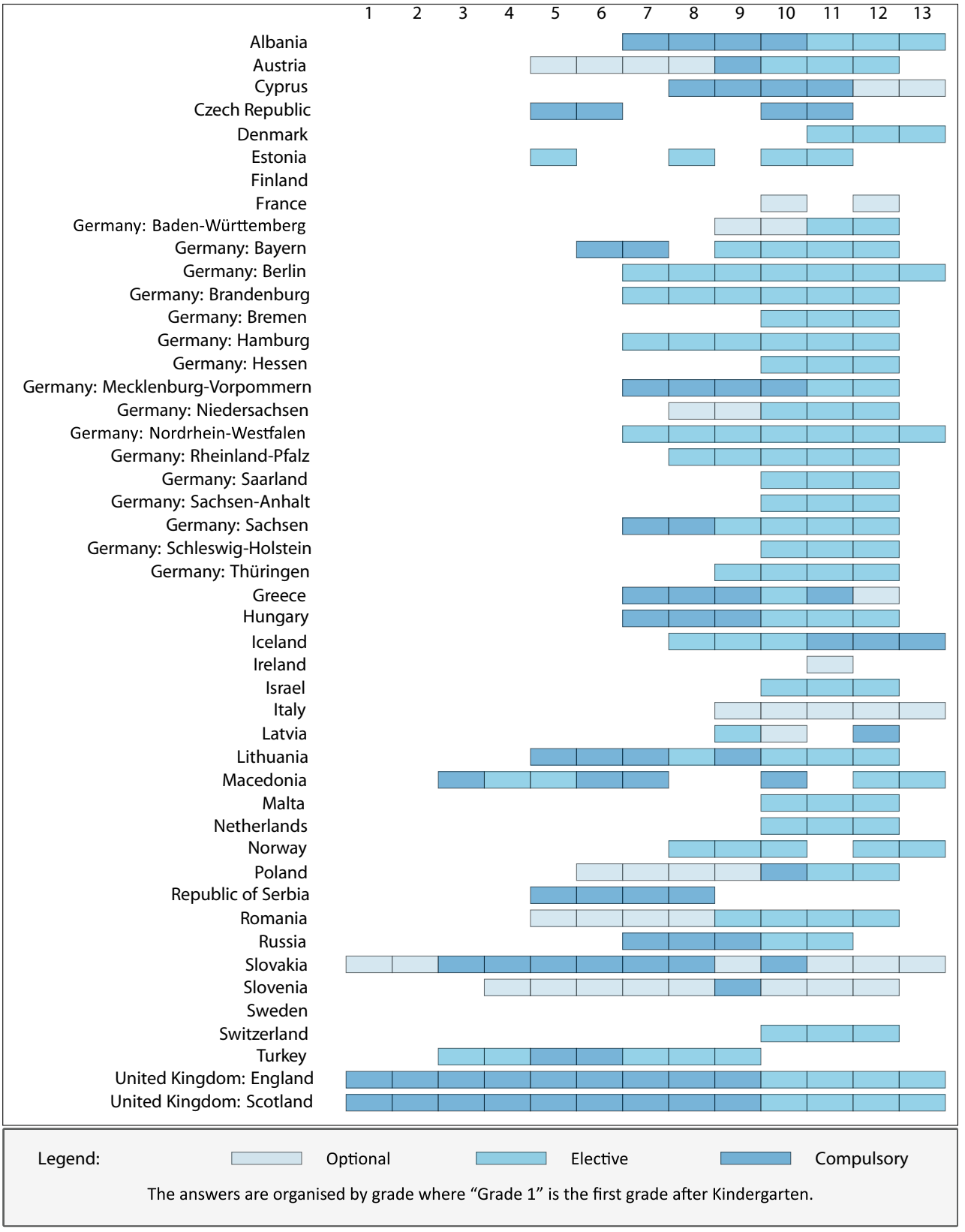


*Figure 4: Availability of Informatics Courses (by Grade)*

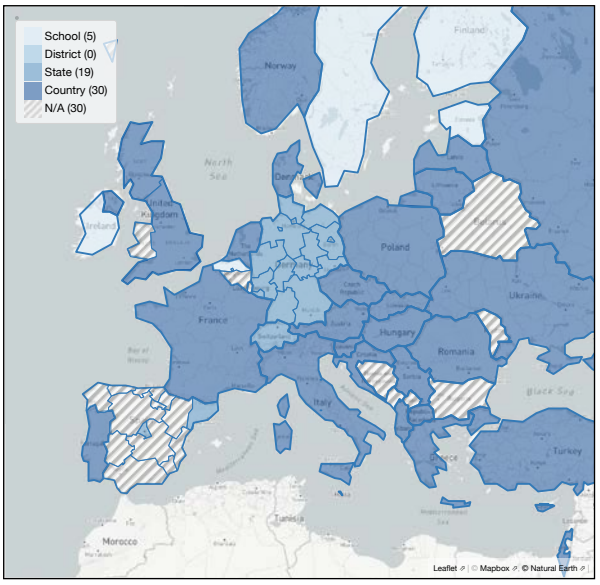


*Figure 5. Informatics: Curriculum Consistency*

The existence of curricula is important but needs to be matched by the presence of enthusiastic and well-qualified teachers who deliver courses that resonate with pupils, challenge them, and attract their curiosity to pursue the subject further. All too often the main achievement is just the existence of the curriculum with much more development being needed to complete the picture.

## 4.2 Digital Literacy

To complement this study, similarly to Informatics, we have also collected data on the current status of Digital Literacy education in Europe. The previous ACM Europe/Informatics Europe report recommends that "all students should benefit from education in Digital Literacy, starting from an early age and mastering the basic concepts by age 12"[17]. Among our goals here were to find out whether and where this is the case in Europe, what form this education, if present at all, takes in any given country, and at what age education in Digital Literacy starts.

### *Digital Literacy: First Contact*

The data shows that pupils in the great majority of Europe (41 out of 52 countries/regions; 79%) first encounter Digital Literacy in Primary School. Just the Flemish region of Belgium (1 out of 53 countries/regions; 2%) already starts Digital Literacy at Kindergarten, while a small number of countries and some states in Germany start later, mostly in Lower Secondary level (9 out of 53 countries/regions; 17%). Just one country— Romania—and the Sachsen-Anhalt federal German state have no formal Digital Literacy content until Higher Secondary level (2 out of 53 countries/regions; 4%). The proper acquisition of digital skills is itself of interest but importantly these skills can be employed to facilitate and support learning. As such the introduction of digital skills even at a very early age can reap considerable benefits and these can be across all disciplines. These benefits will be more greatly enhanced as the digital skills are further developed.

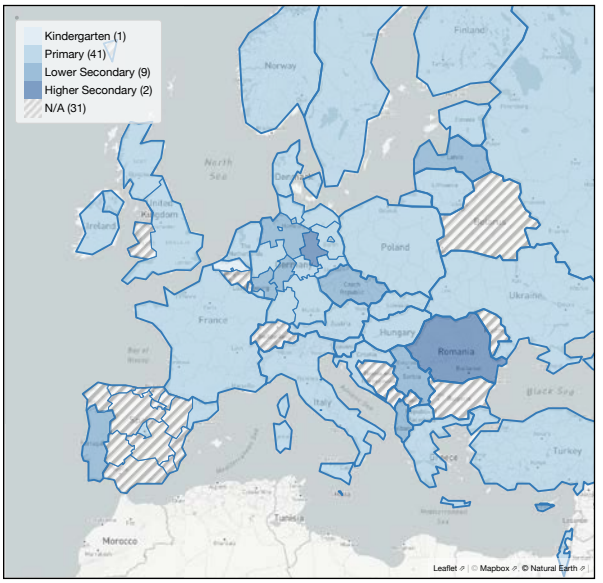


*Figure 6. Digital Literacy: First Contact*

17 Gander et al. (2013): Informatics education: Europe cannot afford to miss the boat, Report of the joint Informatics Europe & ACM Europe Working Group on Informatics Education.

### *Digital Literacy: A Separate Subject?*

Two possible approaches to teaching Digital Literacy are found in Europe; the subject is taught either as a separate subject (28 out of 54 countries/regions; 52%), or as individual topics integrated into other subjects (26 out of 54 countries regions; 48%).

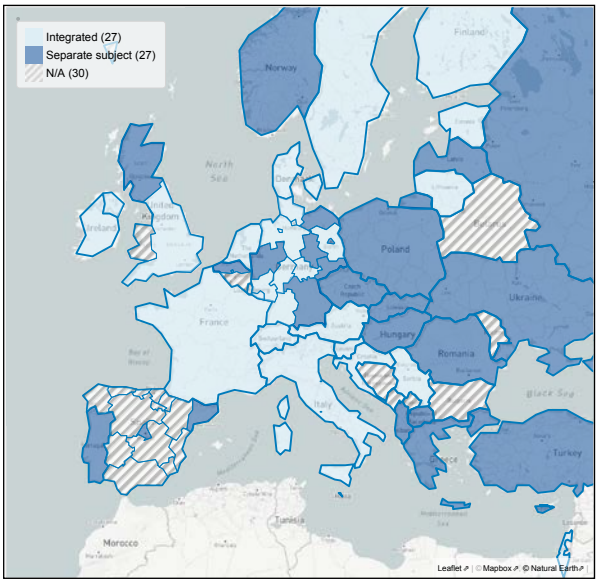


*Figure 7. Digital Literacy: A Separate Subject*

Both approaches are entirely valid and involve the non-trivial task of ensuring that pupils use computers in a disciplined, effective, efficient, and safe manner while ensuring also that they maintain a long-term interest in keeping up-todate as technology evolves and reaping the benefits of those changes.

### *Digital Literacy: Curriculum Consistency*

In most countries and regions included in this data mode (40 out of 53 countries/regions; 76%), the Digital Literacy curriculum is defined at national or state level, ensuring consistency of content across the whole of an administrative region. There are, however, several countries (Austria, Switzerland, Estonia, Finland, Ireland[18], Israel, Italy, and the Ukraine) and five German states where curriculum content is left to individual schools (13 out of 53 countries/regions; 24%).

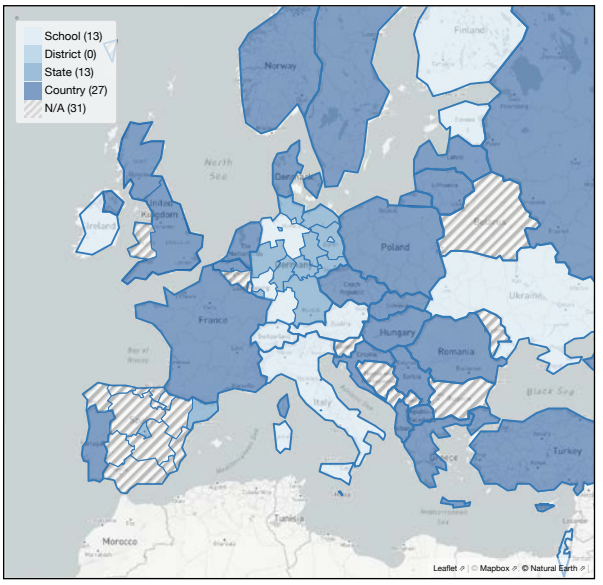


*Figure 8. Digital Literacy: Curriculum Consistency*

Generally, across Europe, this reflects a view that Digital Literacy is of sufficient importance that it merits attention at the highest levels in education. Such curricula need constant updating given the rapid changes in technology (e.g. the emergence of voice activated devices and robots) and that needs to be addressed. Such curricula should "emphasise not only skills but also the principles and practices of using them effectively and ethically"[19], in particular drawing attention to matters associated with safety and privacy.

### *Digital Literacy: Enrolment*

The response rates for enrolment were comparatively low; reliable data could only be obtained for 33 countries/regions. For them the data shows that once Digital Literacy is taught, it is usually taught to all students (26 out of 33 countries/regions; 79%). Only Cyprus and some German states teach this subject selectively; in these cases (7 out of 33 countries/regions; 21%), only a very small number of students (less than 10%) are being taught.

18 There are, however, clear government/policy guidelines regarding the use of ICT across other subjects that all schools are expected to follow.

19 Gander et al. (2013): Informatics education: Europe cannot afford to miss the boat, Report of the joint Informatics Europe & ACM Europe Working Group on Informatics Education.

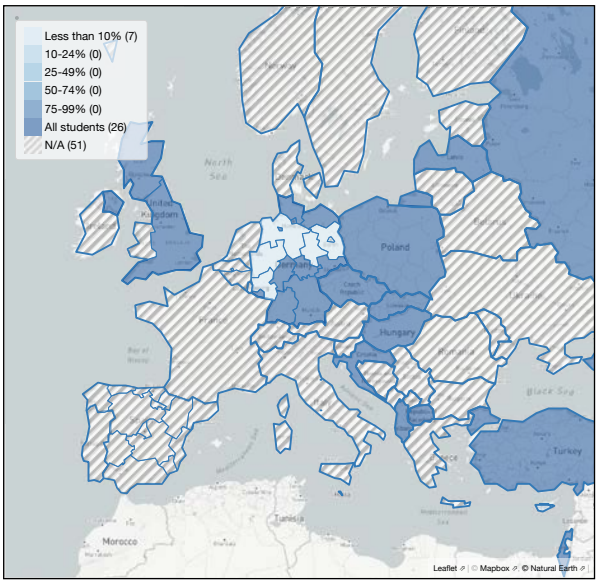


*Figure 9. Digital Literacy: Enrolment*

## 4.3 Teacher Training

A good supply of well-educated and enthusiastic teachers is crucial to support Informatics education in schools at all levels. In many areas, an undersupply is a major problem that can and does lead to stress and isolation. Indeed, retaining the services of Informatics teachers is often problematic and can be addressed in part by providing them with support and by taking steps to keep them up-to-date with developments. Establishing a national or regional teachers' Centre can help. Most of a Centre's activities can be online, but from time to time it is desirable that face-to-face activities take place. Workshops where teachers present and share their work, or seminars where they hear computer scientists or industry employees speaking about their work including theoretical and technological innovations that occurred in the field, can altogether form a mutually supportive computing teachers' community supporting.

The questionnaire sought to look at qualifications for entry to the teaching profession in Informatics, to ask if these differed for entry to other disciplines and to seek some clarification on the nature of preparation that aspiring teachers receive for the teaching of both Informatics and Digital Literacy.

In addition to the data modes discussed here, the Appendix also contains overviews of the number of subjects each teacher is trained in as well as issues about the security of employment for teachers.

### *Teacher Training: Special Qualifications*

In 47 out of 54 countries/regions (87%), there are special studies for teaching Informatics in secondary schools just as there are for "established" subjects like Mathematics or Physics. Only in seven countries/regions (13%), has no dedicated teacher training for Informatics been established. In some of these countries/regions this is due to the fact that Informatics is not available as a subject in secondary schools at all (see Section 4.1).

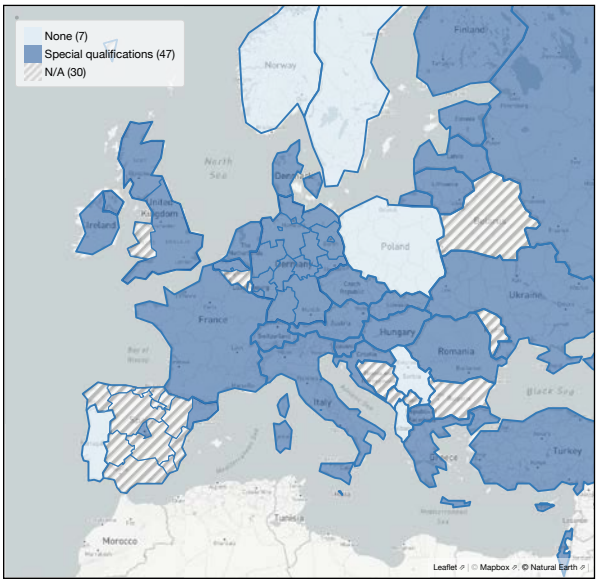


*Figure 10. Teacher Training: Special Qualifications*

Despite the number of countries where no special studies are offered, the status quo in Europe is actually encouraging as provisions for training Informatics teachers, hence, also for offering Informatics courses, are in place. However, the effectiveness of these provisions is uncertain.

### *Teacher Training: Typical Path Availability*

In almost all parts of Europe, Informatics can be studied as a subject for the teaching profession just like any other subject, e.g. Mathematics (45 out of 49 countries/regions; 92%). Only in four regions/countries for which data is available, are such studies currently not possible; see, however, the Appendix for a report on recent changes in France.

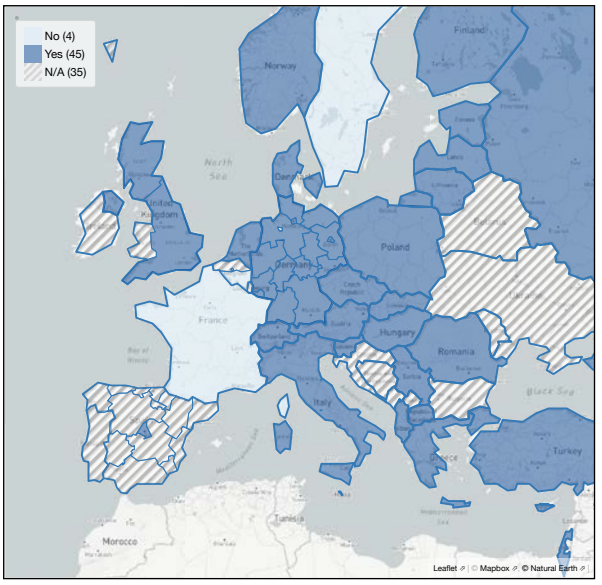


*Figure 11. Teacher Training: Typical Path Availability*

The data gathered shows that, at least in principle, teacher training in Informatics is considered and undertaken on the same level as for any other subject.

### *Teacher Training: Stand-alone Curricula*

There are several countries that offer both a stand-alone Digital Literacy curriculum and a standalone Informatics curriculum to teachers during their training, namely Albania, Cyprus, Scotland, Lithuania, Latvia, Norway, and Russia. A few countries/regions offer a stand-alone Digital Literacy curriculum to teachers during their training (see Figure 12: 8 out of 43 countries/regions; 19%).

In most European countries/regions there is a stand-alone Informatics curriculum for the training of Informatics teachers (see Figure 13: 44 out of 48 countries/regions; 92%). However, Informatics does not feature as a possibility in teacher training in the Walloon region of Belgium, France, Latvia, and Sweden.

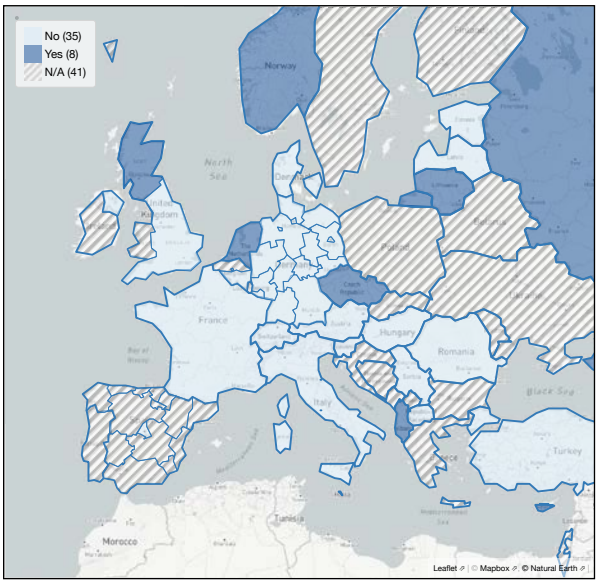


*Figure 12. Teacher Training: Stand-alone Curricula (Digital Literacy)*

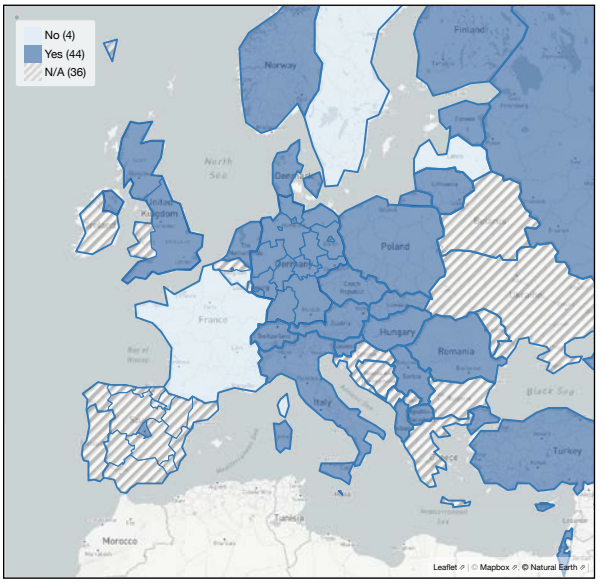


*Figure 13. Teacher Training: Stand-alone Curricula (Informatics)*

It is of considerable concern that so few countries address Digital Literacy in the training of all teachers, including primary teachers. We note that whether or not teacher training contains modules on Digital Literacy and how to teach it, was not addressed in the survey as defining the modules in the implementation of teacher training curricula is usually done at the level of the academic institutions. Hence, no statements regarding the situation at the level of regions or countries could be derived. Nonetheless, teaching Digital Literacy effectively is not straightforward and the constant changes to technology present a challenge. Most children

will have some aptitude for computing even when they first enter the school system and it seems wise to build on this for the purposes of enhancing their education and their educational experience.

It is gratifying that stand-alone curricula in Informatics do exist in most countries across Europe reflecting recognition of its relevance, but ideally such curricula should exist everywhere.

### *Teacher Training: In-Service Training*

Initial training is normally accompanied by a period of in-service training; depending on the country/region, this type of postgraduate training takes place either before starting to teach at a school (e.g. in the German states) or as part of continuing professional development (e.g. as in Israel). In roughly half of the countries/regions for which data was available, the duration of this in-service teacher training is between six months and one year (21 out of 45 countries/regions; 47%) while in most other countries/regions the required period is between one and two years (21 out of 45 countries/regions; 47%). Data from only three countries (Russia, Slovenia, and Turkey) indicates that there is no in-service period requirement (3 out of 45 countries/regions; 6%).

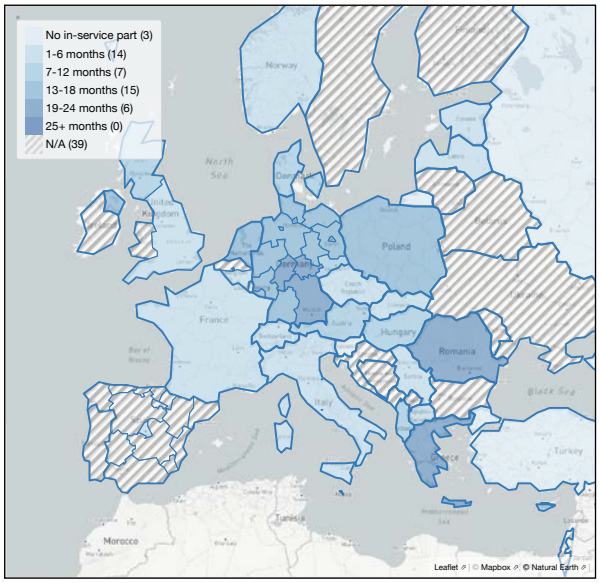


*Figure 14. Teacher Training: In-Service Training*

While across Europe it is agreed that a supply of well-educated teachers is needed, it seems that in-service training after graduation is not undertaken to the same extent in all countries. In addition to the practical training, continuing professional development should be encouraged, if not mandated, for teachers in Digital Literacy and Informatics. Unless Informatics is taught on a larger scale, schools may have only a small number of Informatics teachers; so community-building efforts are of importance. The "master teachers" programme currently in effect in the United Kingdom is one way of alleviating this situation; another option would be to have national or regional teachers' centres as Israel.

### *Teacher Training: Entry Requirement*

For teaching in secondary schools—the level at which Informatics tends to be taught—the requirements for entry in most countries/region where data was available consists of a Masters' degree, either an M.Ed. degree or an M.Sc. degree with a relevant postgraduate teaching certificate (29 out of 48 countries/regions; 60%). Some countries/regions require a B.Ed. degree or a B.Sc. degree with a relevant postgraduate teaching certificate (9 out of 48 countries/regions; 19%) while other countries/regions do not require any teaching-related degree or certificate (10 out of 48 countries/regions; 21%). In all countries/regions surveyed, the requirements are the same across all subjects.

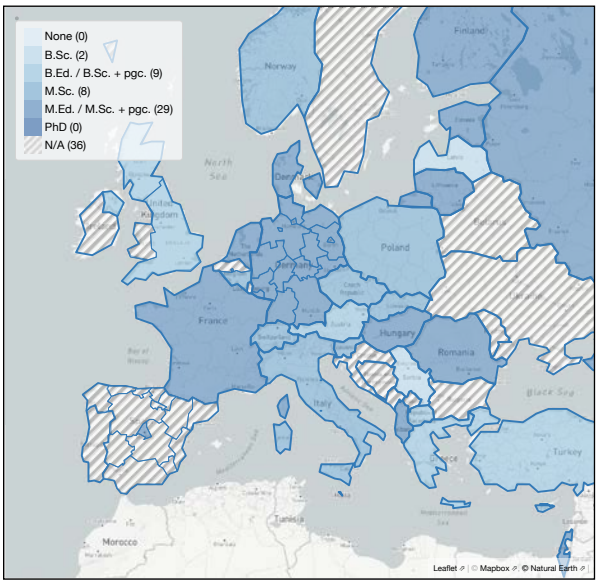


*Figure 15. Teacher Training: Entry Requirement*

One of the inhibitors to the uptake of Informatics at school in some areas seems to be the availability of a good supply of well-qualified and enthusiastic teachers. In many areas, this is a major problem, e.g. because there are more lucrative possibilities in employment in business or industry. Solutions need to be found. Even where teachers do exist, they are often present in very small numbers and feelings of isolation can exist.

In seeking solutions to this problem, there is a tempta-

tion to reduce requirements for entry to the profession or to increase the incentives. Certainly, reducing standards is ill-advised though attracting teachers from well-served areas or changing standards presents possibilities. There is scope for the community across Europe to share experiences on this topic and to support one another.

### *Teacher Training: Professionals as Teachers*

Steps to encourage Informatics graduates to enter the teaching profession were not addressed in the study. However, questions were asked regarding the possibility of computing professionals (such as software engineers) with an academic non-educational degree and work experience, but no formal educational training, switching careers to become Informatics teachers. In practice, this path is closed in most countries, with only Austria, Greece, and Slovenia (3 out of 46 countries/regions; 7%) being prepared to consider this transition. Of the remaining countries/regions, most require minor additional educational training (26 out of 46 countries/regions; 57%); while the others have closed this path completely (17 out of 46 countries/regions;36%).

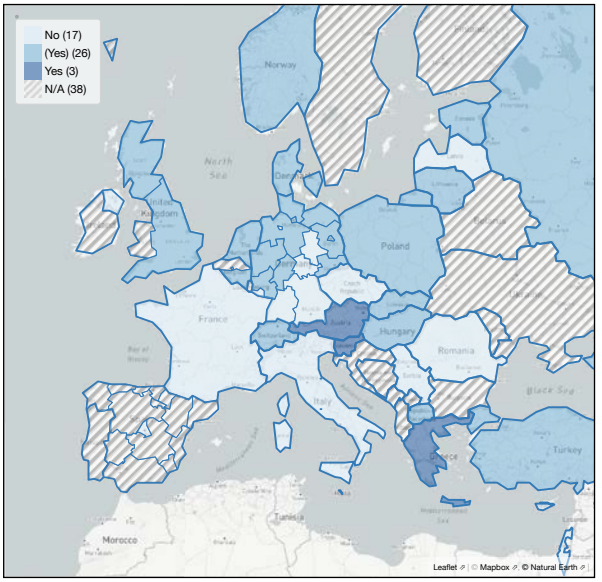


*Figure 16. Teacher Training: Professionals as Teachers*

Most countries value the importance of didactical training by not allowing the possibility of switching careers from the IT profession to teaching without educational re-training. As with any other subject, Informatics teachers should be well-educated regarding the disciplinary facet as well as the pedagogical methodological facet. This requirement is crucial; thus, it is recommended that this path should be closed completely wherever it is still open or partially open.

### *Teacher Training: Professional Experience Replacing a Degree*

Another possibility that was investigated was to consider professional experience as a substitute for formal subject qualifications, with the possibility of requiring some minor additional educational training. In practice, this is possible without additional formal training in the Walloon region of Belgium, England, and Mecklenburg-Vorpommern in Germany (3 out of 47 countries/regions; 6%). In several other countries/regions, such a career change is possible with minor additional training, these including Albania, Iceland, the Netherlands, Norway, and Turkey (5 out of 47 countries/regions; 11%). The large majority of countries/regions, however, do not allow professional experience to replace an academic degree (39 out of 47 countries/regions; 83%).

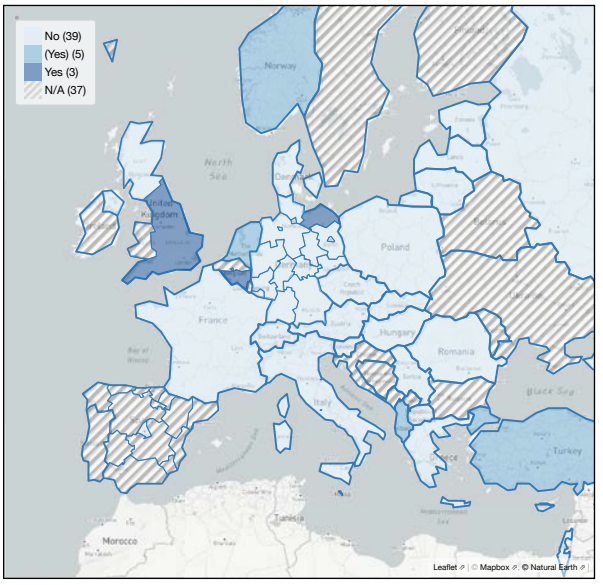


*Figure 17. Teacher Training: Professional Experience Replacing a Degree*

It is encouraging that most countries understand that having professional experience is not enough for teaching, even if the experience was in computing and they do not allow professional experience to replace a formal education. Unlike scientists or professionals working in industry who usually specialise in a specific area, teachers should be discipline experts able to convey the material properly, invoke students' curiosity and project their discipline in an attractive way. This needs more than professional experience; it needs formal broad education of the discipline as well as special pedagogical knowledge. Hence, the occasional suggestion to bootstrap the teaching of Informatics by having professionals (co-)teach in schools without any extra train-

ing does not only go against pedagogical thinking but it is simply not in line with current legislature.

### *Teacher Training: Re-Training Without Completing a Full Academic Training*

The study further sought to gain insights about the possibility of teachers of Mathematics, Physics, Engineering, or Business being able to become teachers of Informatics. Questions were asked about the amount of additional training required. Was it full academic training or did the required training fall short of that? Then could the training be classified as minor or substantial? Or was it possible to teach Informatics without any additional training? A wide spectrum of possibilities emerged.

In twelve countries/regions (Cyprus, the Czech Republic, Greece, Hungary, Israel, Malta, Romania, and the German states of Bayern, Bremen, Hessen, Saarland, and Schleswig-Holstein) no teacher of these subjects is allowed to re-train to teach Informatics unless he/she completed a full academic training. That means that there are only a relatively small number of European countries/regions that require Informatics teachers to have completed a full academic training with no exception to this rule.

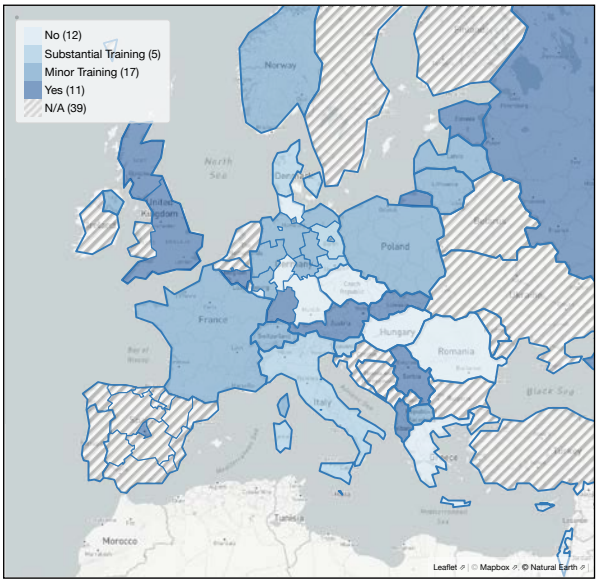


*Figure 18. Teacher Training: Re-Training of Mathematics Teachers Without Completing a Full Academic Training*

The most frequent exception to the rule is to relax the requirements for re-training Mathematics teachers; the corresponding chart is shown on the right. The number of countries/regions allowing Mathematics teachers to teach Informatics with no formal retraining (11 out of 45 countries/regions; 25%) is about the same as the number of those requiring only minor retraining (17 out of 45 countries/regions; 36%). The remaining countries/regions require either substantial re-training (5 out of 45 countries/regions; 9%) or a full academic training (12 out of 45 countries/regions; 27%).

Also, only very few countries offer a non-trivial re-training for in-service teachers that is more than a certificate course but less than a full academic training. It appears that the administrative overheads and the off-service time needed to re-train makes such a program infeasible.

In Austria, the Walloon region of Belgium, Estonia, the German state of Baden-Württemberg, Slovakia, the Spanish region of Madrid, and the England and Scotland nations of the United Kingdom, any teacher is allowed to teach Informatics without any extra training (8 out of 38 countries/regions; 21%) or with only minor additional training (10 out of 38 countries/regions; 26%); the corresponding chart is shown below(left).

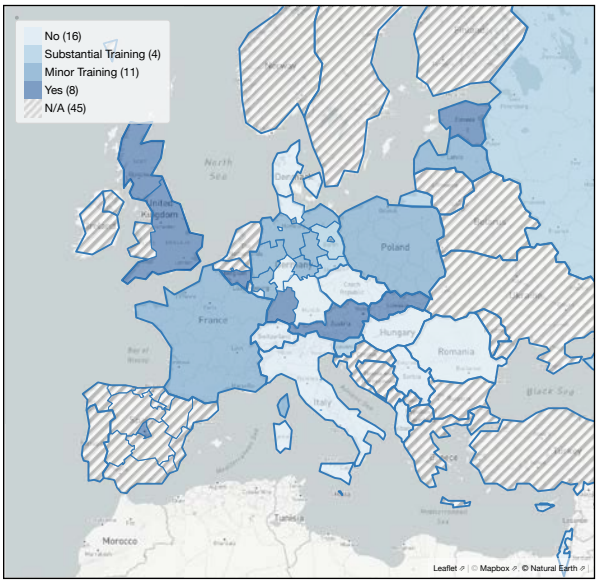


*Figure 19. Teacher Training: Re-Training of Teachers for Any Subject Without Completing a Full Academic Training*

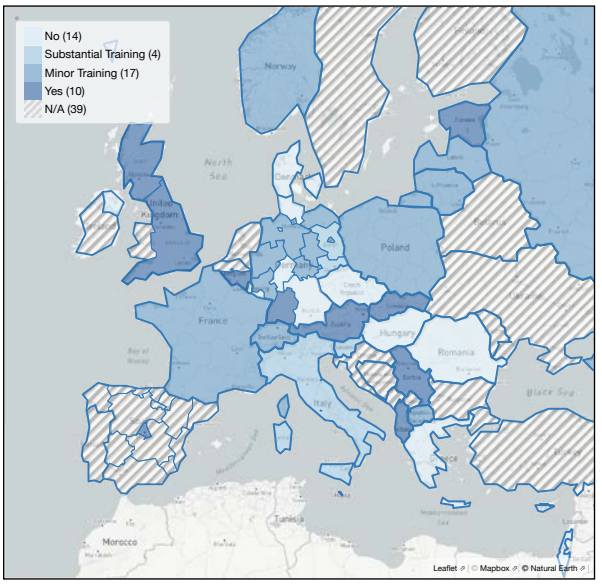


*Figure 20. Teacher Training: Re-Training of Physics Teachers Without Completing a Full Academic Training*

Data for Physics teachers (See Figure 20), Engineering teachers (See Figure 21), and Business teachers (See Figure 22) has been collected. As several countries do not offer Engineering or Business as a stand-alone subject, the data regarding these subjects is less complete.

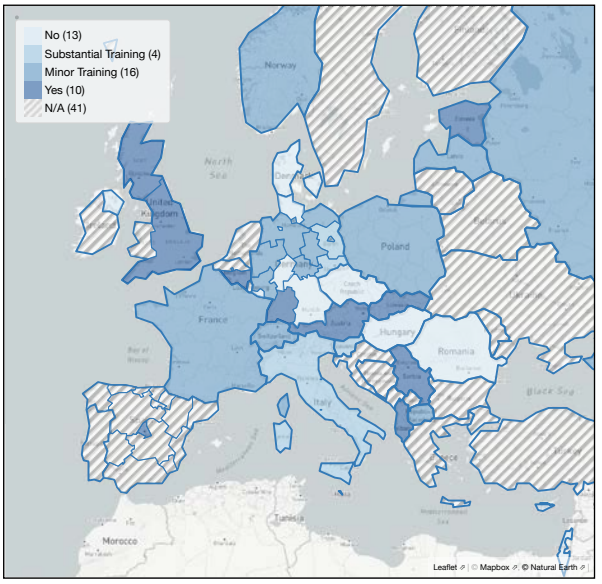


*Figure 21. Teacher Training: Re-Training of Engineering Teachers Without Completing a Full Academic Training*

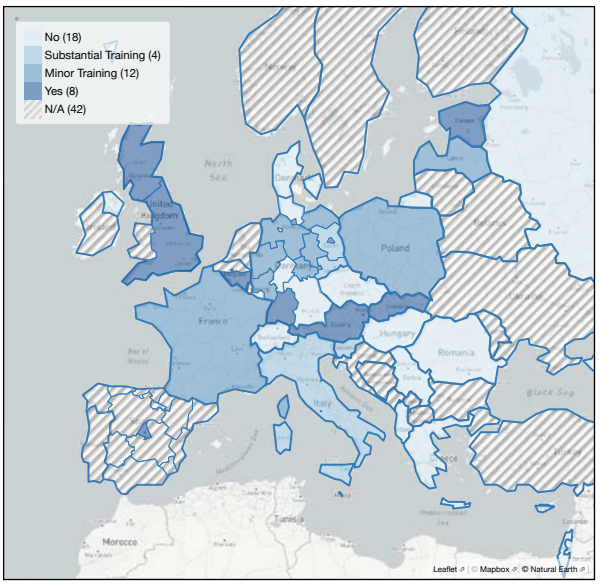


*Figure 22. Teacher Training: Re-Training of Business Teachers Without Completing a Full Academic Training*

An important conclusion is that a rather large number of European countries do not, at least de facto, consider Informatics to be a subject that is on par with other subjects as teachers are not required to study the subject matter before teaching it. In several countries, Mathematics teachers, Physics teachers, or Engineering teachers are allowed to teach Informatics without any extra training, and—as discussed above—some countries allow any teacher to teach Informatics without any extra training.

As already mentioned, Informatics is a distinct scientific discipline, characterised by its own concepts, methods, body of knowledge and open issues. In all countries, Informatics teachers should be required to have full academic training, as is the case with other scientific disciplines. Even a very well established Informatics curriculum cannot be implemented if there are no well-educated and trained teachers. These teachers need to have a formal disciplinary education and the methodological skills crucial for the discipline.

# 5. Acknowledgements

This project would not have been possible without the dedication and contributions of many European colleagues and volunteers:

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CECE was established by and acknowledges the support of ACM Europe and Informatics Europe and the members of the respective boards.

# A. About Informatics Europe and ACM Europe

**Informatics Europe** (www.informatics-europe.org) is the association of European Informatics/Computer Science academic departments and research laboratories. The mission of the organisation is to foster the development of quality research and education in Informatics. Specific aims include:

- To act as the representative of the European Informatics research and education community.
- To foster high-quality research in the field.
- To keep improving the quality of Informatics teaching.
- To help the public understand the contribution of Informatics to social and economic development and the scientific challenges of the discipline.
- To foster the cooperation among education, research and industry.
- To establish effective relations between the Informatics community and governmental authorities.
- To provide links to other national and international organisations with complementary aims.

Among its many services, Informatics Europe organises the annual European Computer Science Summit, where Deans/Chairs of faculties/departments, laboratory directors and senior faculty and researchers gather to discuss common issues and challenges; provides regular reports with key facts and figures of Informatics higher education in Europe; offers a process of research quality assessment for academic departments; organises awards such as the Best Practices in Education and the Minerva Informatics Equality Awards.

**ACM** (www.acm.org), the world's largest educational and scientific computing society, delivers resources that advance computing as a science and a profession. ACM provides the computing field's premier Digital Library and leading-edge publications, conferences, and career resources. The **ACM Europe Council** (europe.acm.org) was launched to recognise and support European ACM members and activities. Comprised of European computer scientists, it aims to increase the level and visibility and relevance of ACM activities across Europe. It is focused on a wide range of activities, from high-quality ACM conferences in Europe, through expanding ACM chapters, to encouraging greater participation of Europeans in all dimensions of ACM. Its goals are:

- Join with other computing and scientific organisations in Europe to offer new programs and activities.
- Encourage nominations of European members for the advanced grades of Senior Member, Distinguished Member, and Fellow.
- Work with ACM SIGs to increase the number of ACM conferences in Europe. Increase the number of ACM chapters and level of activity in Europe.

## B.1 Recent Evolution of Informatics Education in Denmark

There is currently a positive development regarding Informatics in school in Denmark:

- In 2016, Informatics has become a compulsory or elective subject in secondary education; earlier, it was only optional.
- In 2017, Informatics becomes a new optional subject in the final years of primary school.
- Various governmental strategy reports recommend Informatics as a compulsory subject in school but also in all relevant study programs in higher education as well as adult and further education.

### *Secondary School*

In 2016, the Danish Parliament reached agreement about a new reform for secondary school. As a consequence of the reform, Informatics is introduced as a distinct subject for common "bildung" and preparation for further education.

In various forms, Informatics has existed in Danish secondary school since 1971, but only as an optional subject (further details about the history of computing in Danish secondary school can be found here[20]).

There are three types of secondary schools in Denmark: general secondary school also known as gymnasium (stx), technical secondary school (htx) and business secondary school (hhx).

With the new secondary school reform, Informatics has become a compulsory subject in hhx, a semi-compulsory subject in htx and an elective subject in stx.

The general requirement for secondary school teachers in Denmark is a master's degree in two subjects, a major and a minor (a minor is 120 ECTS). The Ministry of Higher Education and Science and the Ministry of Education have just started the process of defining specific entry requirements for prospective Informatics teachers.

Continuing education programs will soon appear as in-service training/professional development for secondary school teachers who wants to fulfil the entry requirements for Informatics. Similarly, degree programs will be developed for university students aiming for a career as secondary school teacher in Informatics.

### *Primary School*

The Minister of Education has just announced an optional Informatics subject for grade 7–9 that schools can offer from summer 2017.

### *Political Recommendations*

Until recently, there has not been a political awareness of the importance of general Informatics education in the Danish school system. However, things are changing rapidly.

In December 2016, the Danish Growth Council (formerly known was the Danish Council for Trade and Industry) published a 120-page report with recommendations to the Danish government.

The report contains an extensive list of recommendations, and five of these are highlighted as so-called "Here & Now Recommendations". One of the five "Here & Now Recommendations" is about Computational Thinking as a mandatory component in education at all levels. In the summary of the report (p. 6) it says:

"Computational Thinking must become an integrated and compulsory part of education at all relevant educational programs – in primary, secondary and tertiary education as well as adult and further education. It is crucial that the proper digital and analytical level of knowledge is secured among teachers throughout the educational system."

On pp. 23–26, the recommendation is elaborated under the headline Computational Thinking must be part of the educational food chain.

Other governmental strategy reports are on their way with supposedly similar recommendations; two are expected in the first half of 2017: A national STEM strategy and a strategy for Denmark's digital growth.

20 Caspersen, M.E. and Nowack, P. (2013): Computational Thinking and Practice — A Generic Approach to Computing in Danish High Schools, http://www.cs.au.dk/~mec/publications/conference/41--ace2013.pdf

## B.2 Recent Evolution of Informatics Education in France

***General***

The situation is changing rapidly in France. The government has strongly asserted that Informatics education is essential for the training of the whole population, insisting on the fact that is should not be limited to Digital Literacy but that it should promote real understanding of the main CS notions and of how they are used for creative activities in various fields. This has even been worded in a law (everything is worded in a law in France). Programs have been defined and published for all classes. Their implementation has started, but quite slowly and with a very reduced training of teachers (lack of money, and still strong resistance in many places). No Informatics discipline is created for the time being, meaning that the qualification of teachers remains accessory to other disciplines, which we feel as an impediment to rapid extension. One of the said reason is the persistent shortage of math teachers, with the fear that introducing an Informatics discipline will worsen it; another fear expressed by the authorities is that it would be hard to find Informatics teachers due to the salary gap between the low salaries of teachers and the high salaries offered by Industry (both statements are yet unproven). There are probably also unsaid reasons, but we are definitely not desperate about the creation of real disciplinary diploma and actively fighting for it. In any case, the movement seems started, and the global government mindset has visibly changed by 180° in the last 3 years w.r.t. Informatics education, which had before encountered a strong opposition since the suppression of any programming teaching. In the sequel, we will go backwards w.r.t. student age, because this is how Informatics education has been introduced. Note that the previous teaching limited to computer and software usage is now considered not to be an education to Informatics.

***ISN : Informatique et sciences numériques (Informatics and Digital Sciences)***

This is the first CS teaching of the new period. ISN is a "specialty teaching" (optional) introduced for scientific Baccalauréat students only, with a final exam counting for the Baccalauréat. It started in September 2012. Its basic CS program has been designed by a group of inspectors, teachers, and researchers. It is designed for 2 hours per week. Two books have been written (in French), one for students and one for teachers; they propose an ambitious program, not to be followed as such but to serve as a reservoir for subjects and projects, as well as articles on the history of computing. The program and is available at the following address (in French): http://www.education.gouv.fr/pid25535/bulletin_officiel.html?cid_bo=57572. It is in the process of being updated with a new proposal published in March 2016: http://www.education.gouv.fr/cid110997/ projet-ajustement-programme-specialite-informatique-sciences-numeriqueclasse-terminale-scientifique.html The ISN program is open or not depending on regional Academies. Some have been really proactive, while others have not moved at all. In the last 2 years some Lycées have run the program but have decided to abandon it, some other, more numerous, have decided to start it. In 2015-2016, about half of the Lycées have opened the ISN program, and about 22,000 students have followed it, of which 23% are female (a growing proportion). Teaching is done mostly based on a mix theory / project, with a large freedom for teachers. The teachers can be of any existing discipline, but with a predominance of math and technology teachers in practice. Teachers need to have a specific qualification to teach this program. In some academies, they have been well-trained, often with the cooperation of researchers (especially from Inria, which leads a strong action towards general public education); in some others, they got the qualification with a very light training only. And, of course, the academies that do not yet propose the ISN teaching have not opened a teacher training.

***ICN : Informatique et création numérique (Informatics and Digital Creation)***

ICN is a new wider audience program is oriented towards understanding the foundations of Informatics, including algorithmics and programming, their use for the processing of as text, images, to data analysis and visualisation, etc., this for a variety of applications domains. The idea is to explain students what is Informatics and how it impacts the society and their own activities. Since September 2015, ICN is proposed as an enseignement d'exploration optional teaching in classes of Seconde générale or technologique (Baccalauréat-2), 1h30 per week, with a program available at http:// cache.media.educagénétion.gouv.fr/file/31/94/3/ensel7386_annexe_455943.pdf. Since September 2016, it is also proposed as an optional teaching for the classes of Première (Baccalauréat-1) L (Literary), ES (Economic and Social) and S (Scientific), 2h per week. In 2017, it will be extended to the terminale (Baccalauréat) classes of the Series L (Litterary) and ES(Economic and Social) with an exam counting for Bac-

calauréat, also with 2h per week. The associated program is available at address http://www.education.gouv.fr/pid285/bulletin_ officiel.html?cid_bo=104657. In all cases, ICN is not a rigid program, and the teaching is supposed to be mostly project-based with a lot of autonomy for teachers. The way ICN teachers will be trained is not yet clear.

***Informatics Teaching at Collège Cycle 4 (Baccalauréat–5 to –3), Cycle 3 (Baccalauréat–8 to –6), and Cycle 2 (Baccalauréat–10 to –8)***

For Cycle 4, Informatics is currently being introduced within both mathematics and technology existing courses with a program that was also designed in cooperation between inspectors, teachers, and researchers. This program is not a separate one, but is included in the (very long) complete program of Cycle 3 teaching. It is about an initiation to the basics of algorithmics, data processing, programming, and how Informatics interfaces with the real world. No timing is specified yet. Since the program is very new, no data is available about the actual implementation. The training of teachers remains an open question. For Cycle 3, last 2 years of primary school and first year of college, the same goals are mentioned but the teaching is only meant as an initiation. For Cycle 2, primary school before cycle 3, it is said that "already in CE1 (second year of Cycle 2, about 7 years old), pupils can code with using a specific software which will lead them in CE2 (8 years old) to the understanding and production of simple algorithms". We push for a mix of plugged and unplugged activities. But the introduction of Informatics in these 3 cycles is completely new and cannot yet be commented. The training of teachers remains an open question, and a difficult one since primary school teachers currently receive very little scientific training.

# C. Data Modes

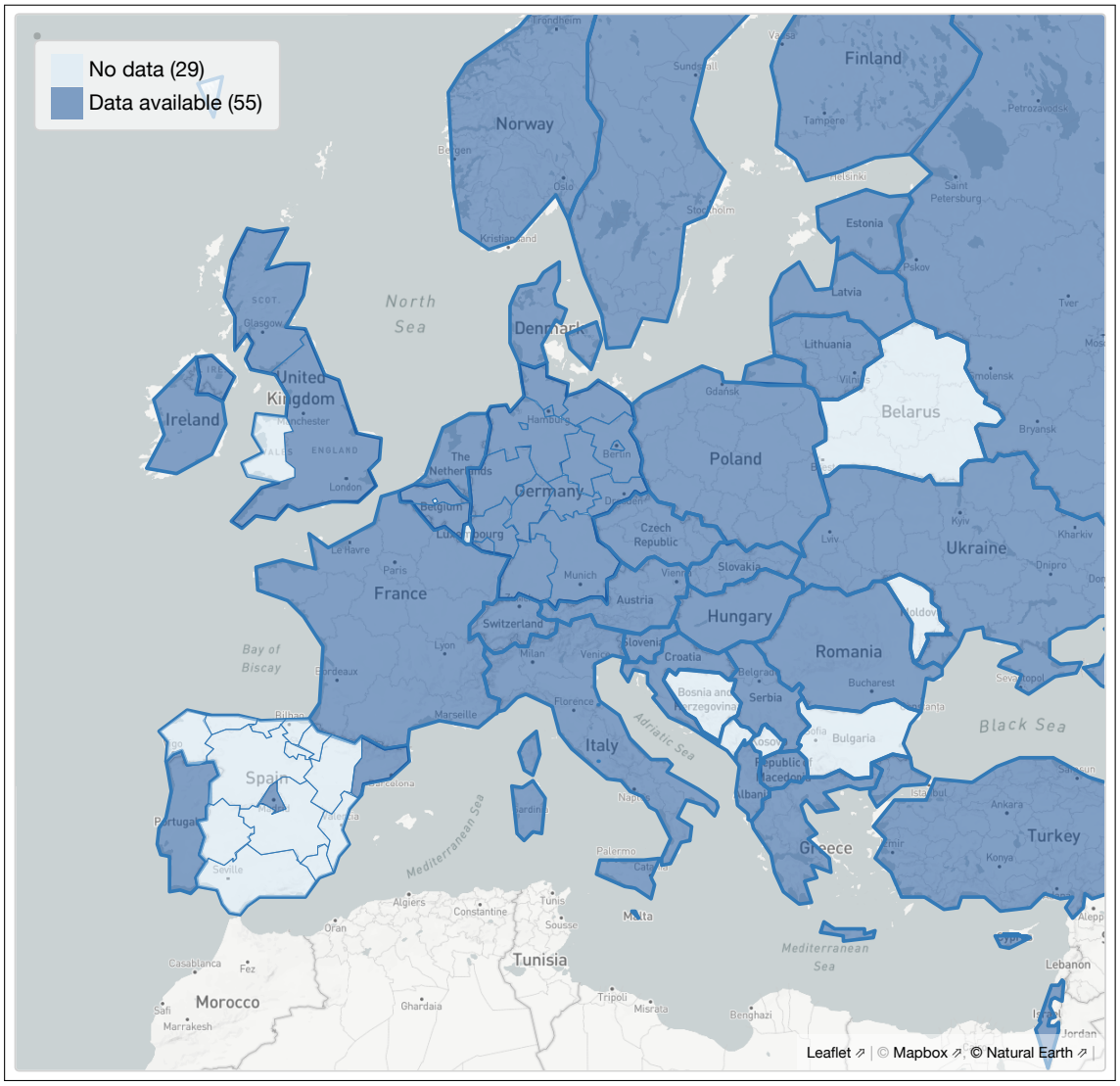
In all charts and maps, we consider administrative units which have autonomous educational systems. Depending on the country, this can be the country itself, e.g. Denmark, a nation, e.g. Scotland, or a federal state, e.g. Bavaria. Hence, the number of such units detailed in this appedix exceeds the number of European countries.

Clicking on the name of an administrative unit in a chart will open that administrative unit's overview page.

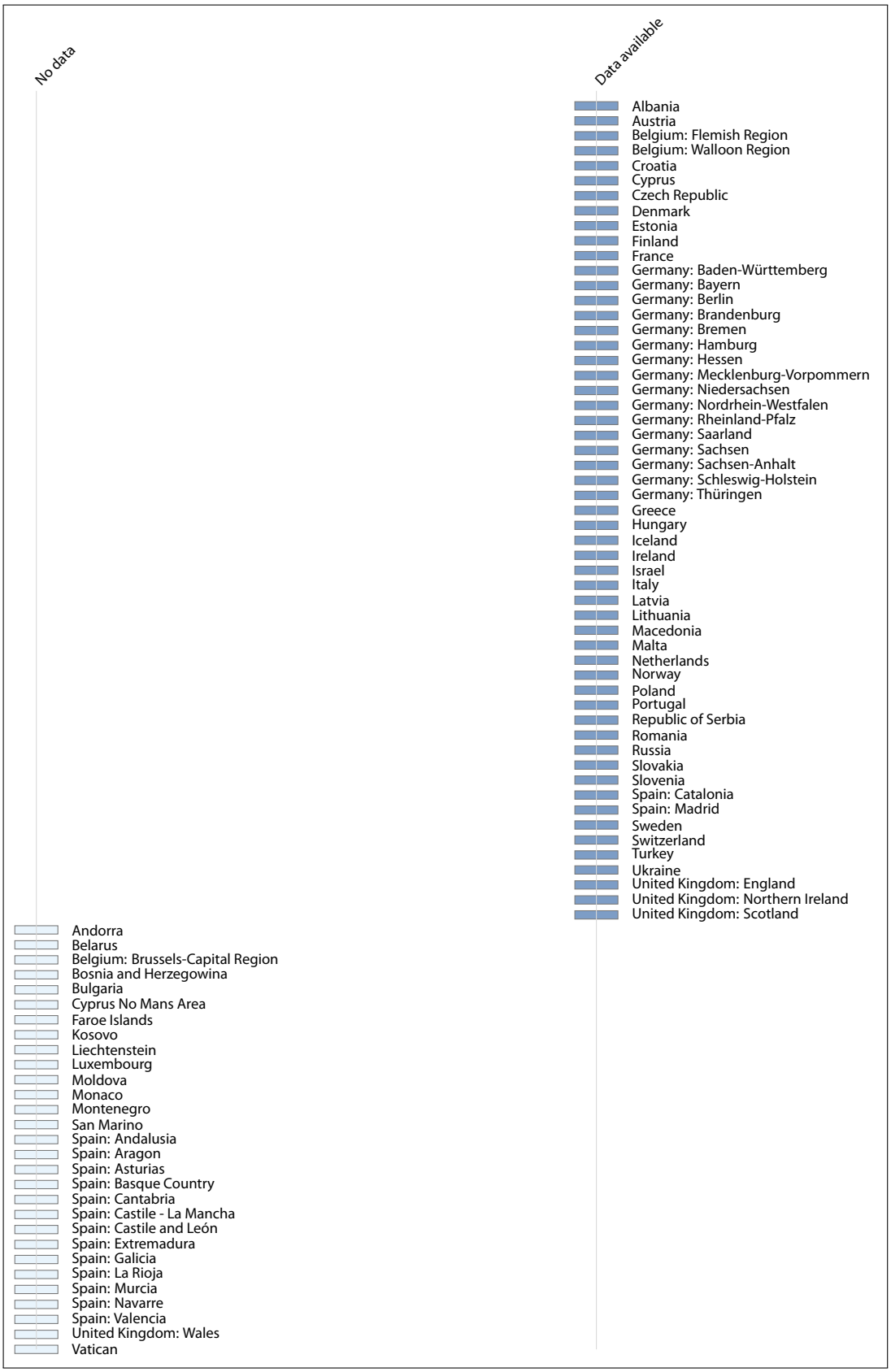
# Data Availability

**What is the data availability status?**

Through the networks of ACM Europe and Informatics Europe, as well as through personal networks, we have established contacts to volunteers and stakeholders in almost all European countries and Israel. The map indicates for which countries data is available.



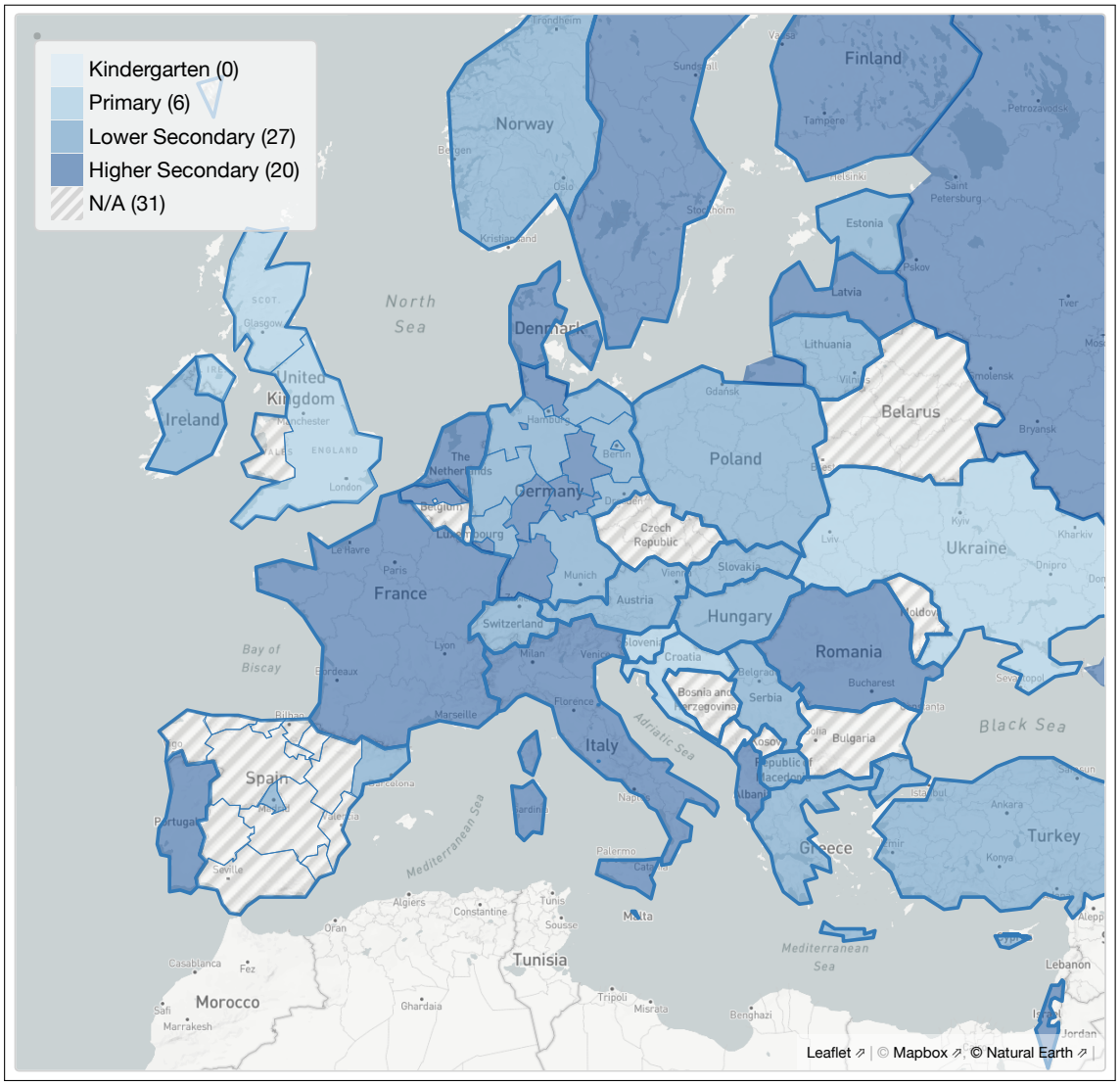
**What is the data availability status?**



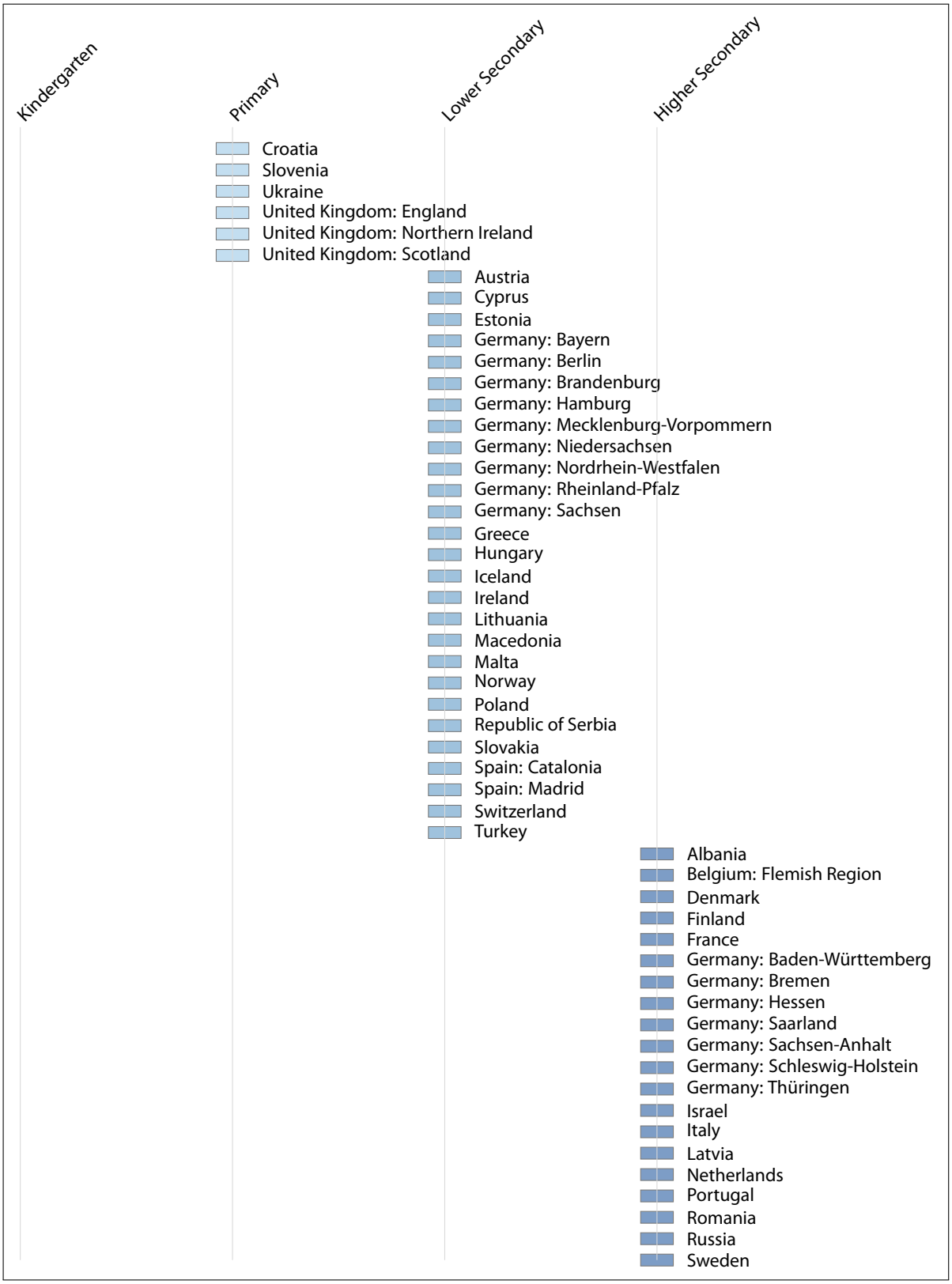
# Informatics: First Contact

**What is the first year pupils are able to attend informatics courses?**

As recommended in the joint ACM Europe/Informatics Europe report "Informatics education: Europe cannot afford to miss the boat", "all students should benefit from education in Informatics as an independent scientific subject, studied both for its intrinsic intellectual and educational value and for its applications to other disciplines". This map details at which age students across Europe currently experience their first contact with Informatics. This information is independent on whether or not the courses are mandatory or elective; see Informatics: Availability of Courses for more details on this. For countries with different types of secondary schools, data is given for schools leading to university entrance qualification.



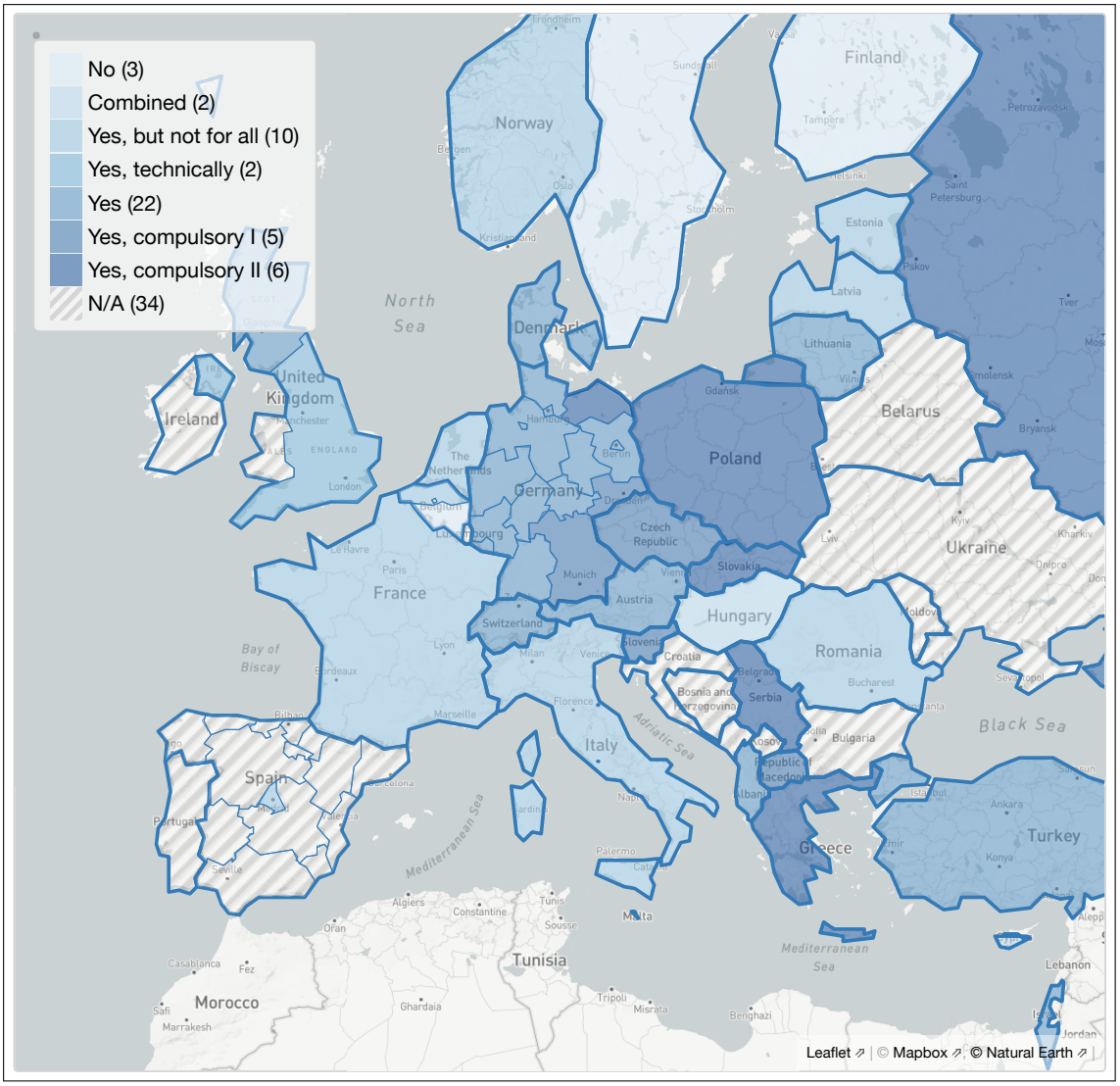
**What is the first year pupils are able to attend informatics courses?**



# Informatics: Availability of Courses

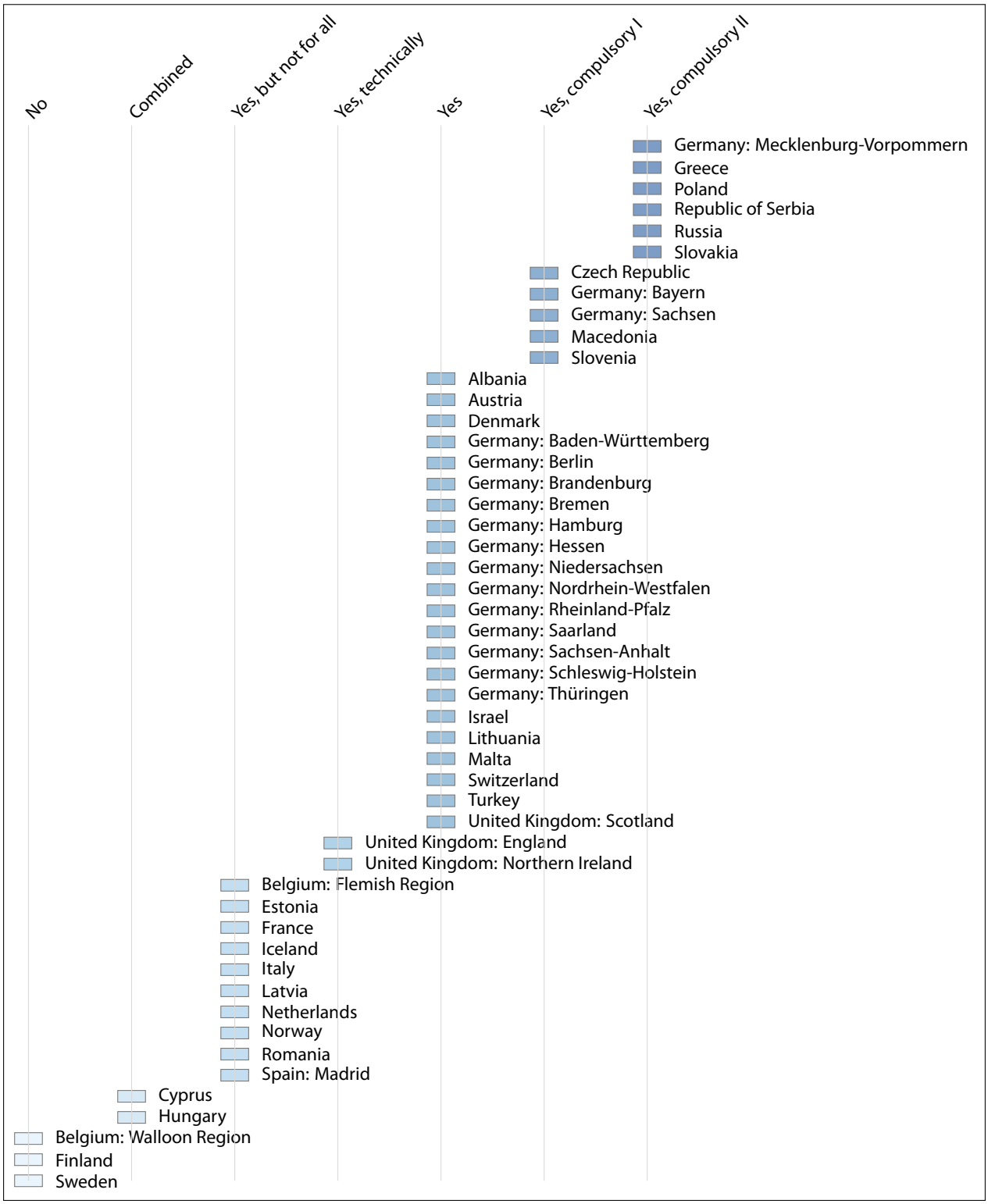
**Are Informatics courses offered in secondary schools leading to possible university entrance?**

Given the demand for fully trained information technology professionals and computer scientists, one of the most frequently named goals in secondary Informatics education is to establish Informatics as a subject at least counting towards science requirements if not as a mandatory subject in secondary schools. This map shows to which extent students have access to Informatics courses in secondary education and whether is implemented as a compulsory or elective subject. For countries with different types of secondary schools, data is given for schools leading to university entrance qualification.




| | |
|---|---|
| **No:** | Informatics is not taught at all. |
| **Combined:** | Informatics is taught combined with some other subject, e.g., Digital Literacy. |
| **Yes, but not for all:** | Informatics is taught at certain types of secondary schools only. |
| **Yes, technically:** | Informatics should be offered, but there are too few teachers. |
| **Yes:** | Informatics courses can be taken at least at some point. |
| **Yes, compulsory I:** | Informatics is a compulsory subject for at most two years. |
| **Yes, compulsory II:** | Informatics is a compulsory subject for more than two years. |

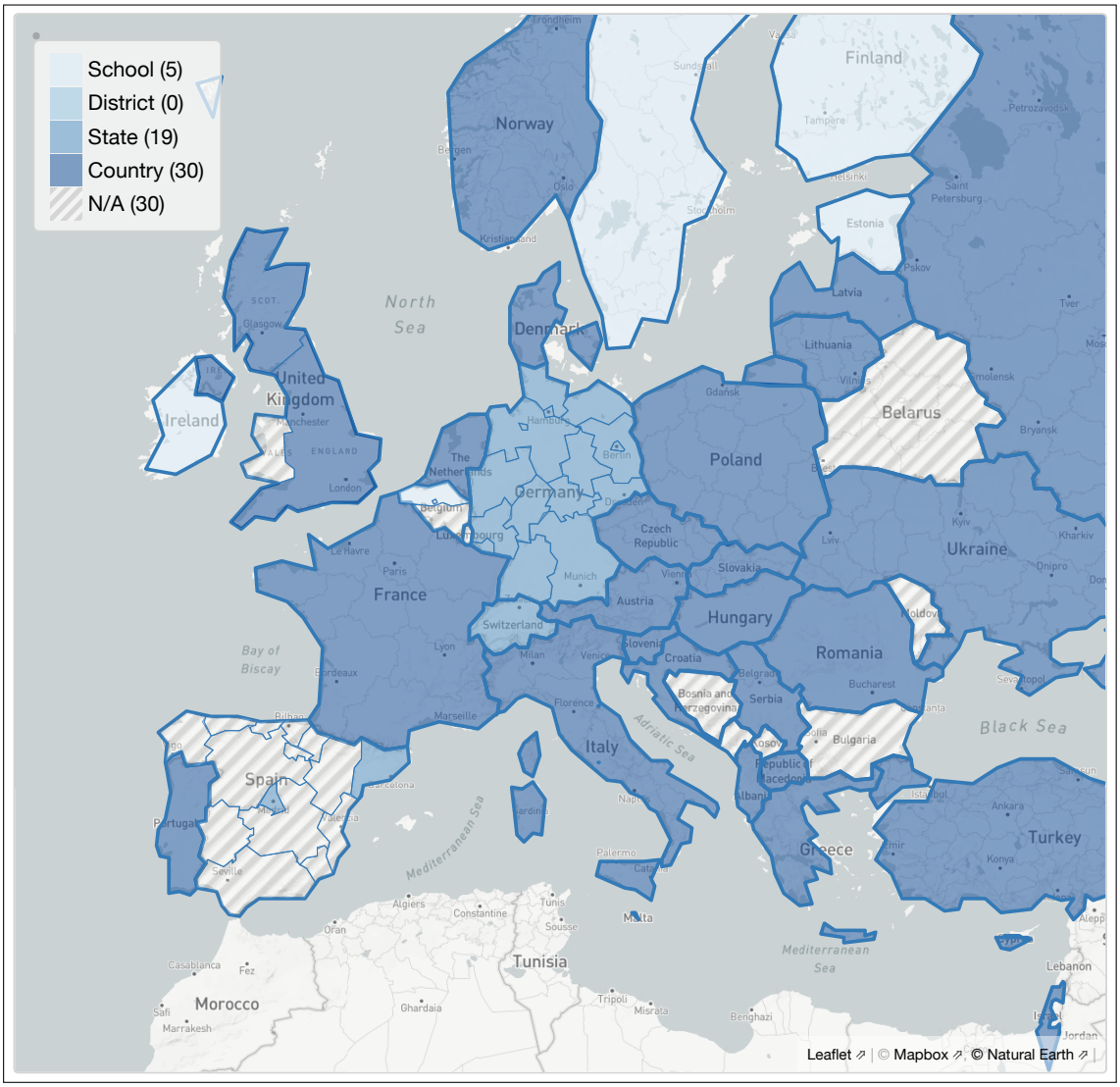
**Are Informatics courses offered in secondary schools leading to possible university entrance?**



# Informatics: Curriculum Consistency

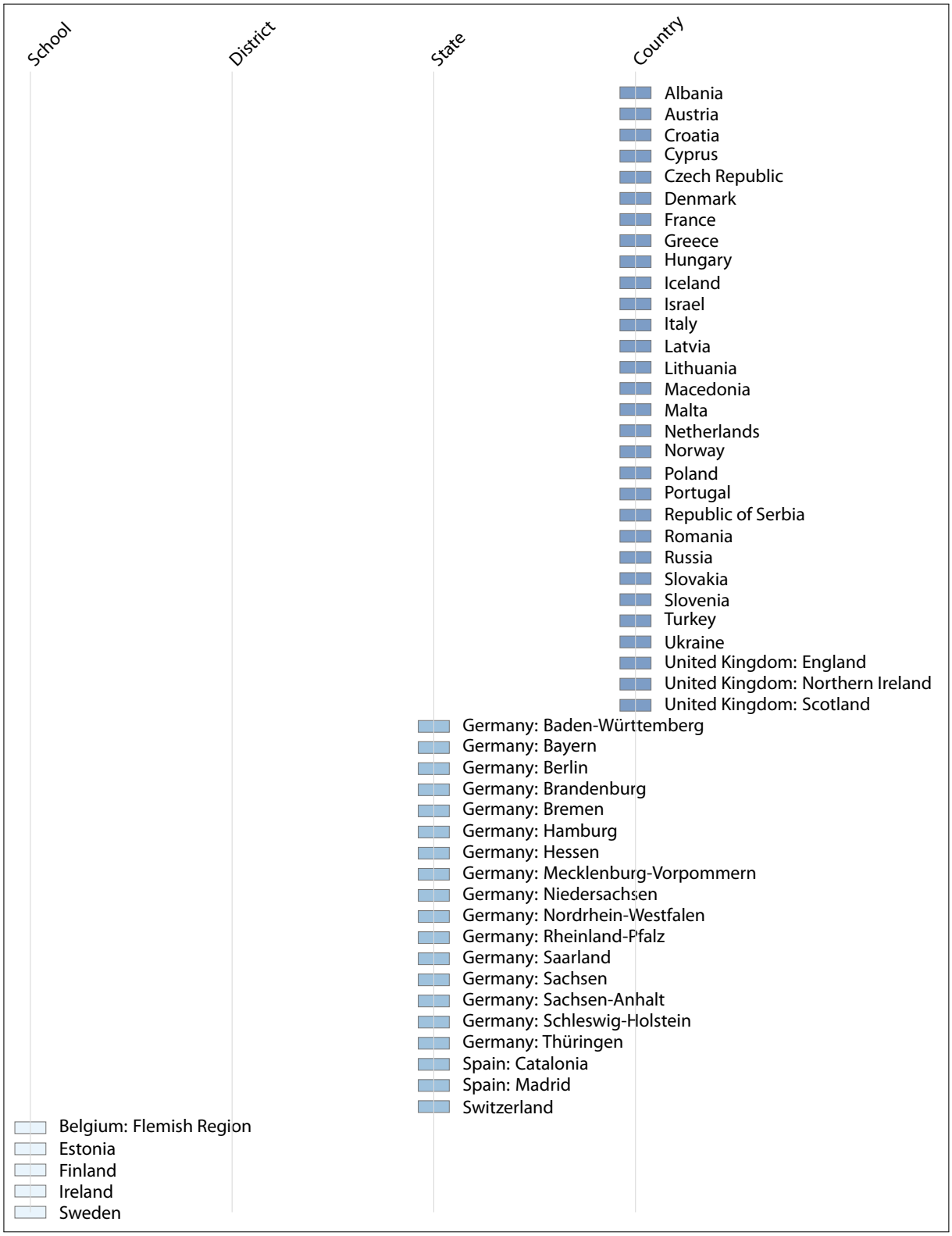
**Is the informatics curriculum in your country consistent across all schools or are there local differences?**

Depending on the administrative structure of the respective country, the curriculum for any given subject is defined at different administrative levels. For subjects taught in an integrated way or as electives that do not count towards final grades, exceptions may apply. The map shows at which administrative level decisions regarding Informatics are made or, put differently, how much leeway is given to instructors.




For the purposes of this mode description, England, Northern Ireland, Scotland and Wales are regarded as four distinct countries.

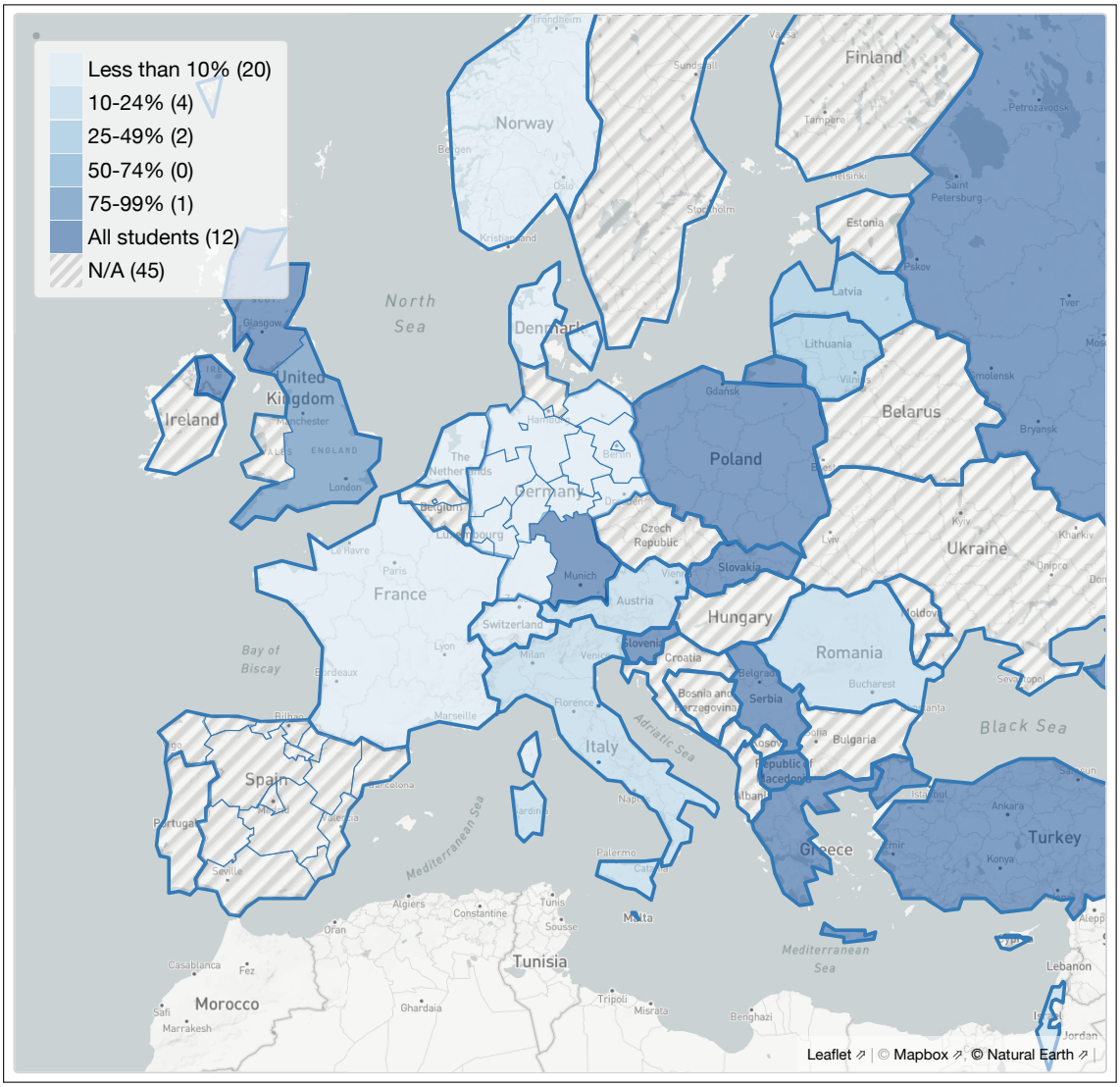
**Is the informatics curriculum in your country consistent across all schools or are there local differences?**



# Informatics: Enrolment

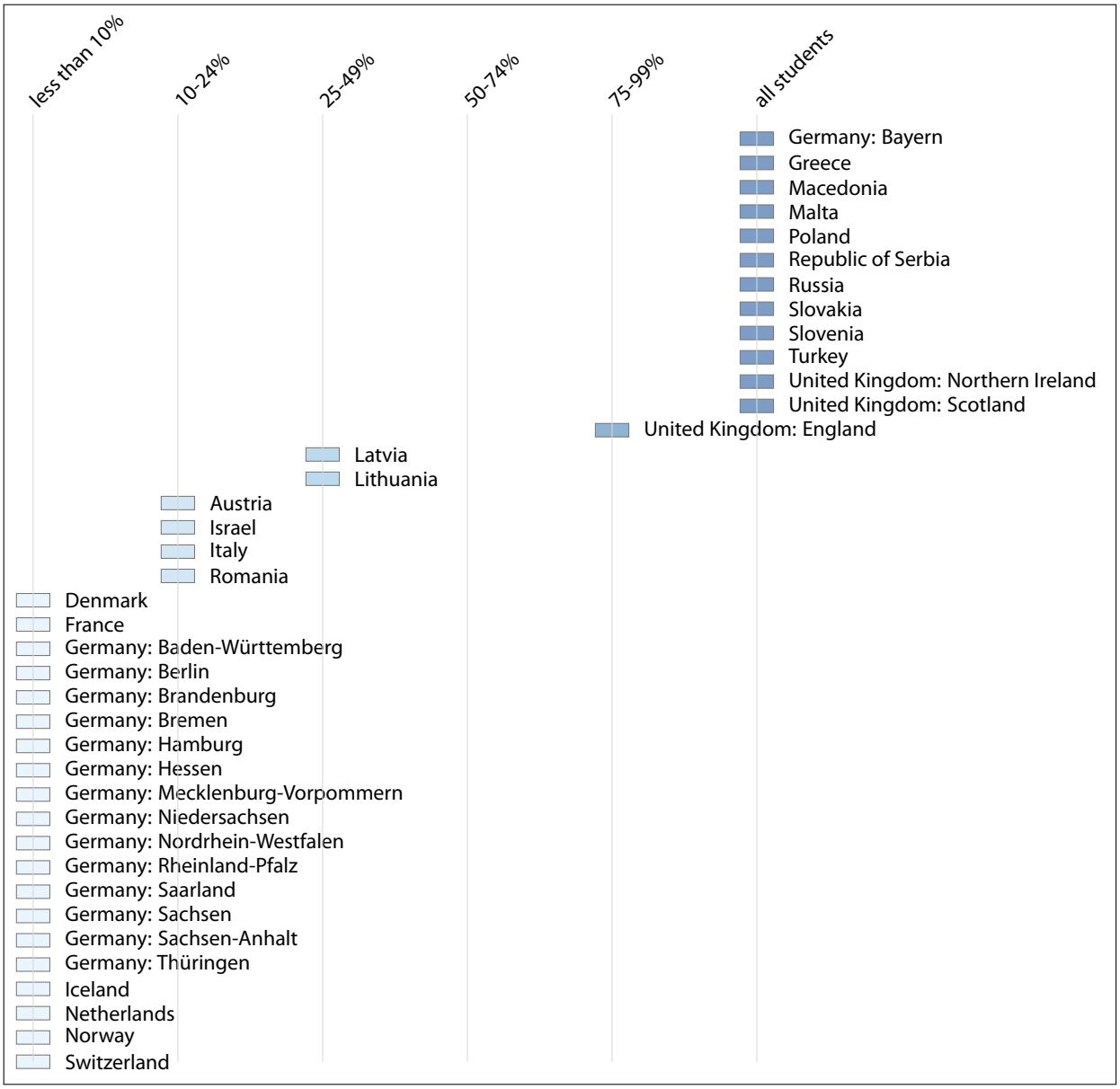
**What percentage of all students typically enrols in Informatics courses in the first two years of secondary education?**

The map shows what percentage of students is exposed to Informatics in the first two years of secondary education. For countries with different types of secondary schools, data is given for schools leading to university entrance qualification.




An attempt was made to determine the uptake of Informatics courses when students were free to make a choice and select Informatics from a list of classes. Gathering such information proved to be problematic due to the lack of official statistics being made publically available; the small amount of evidence available was not encouraging.
Reliable data is given in cases where Informatics is compulsory, i.e., 100% enrolment, or not being offered at all, i.e., 0% enrolment.

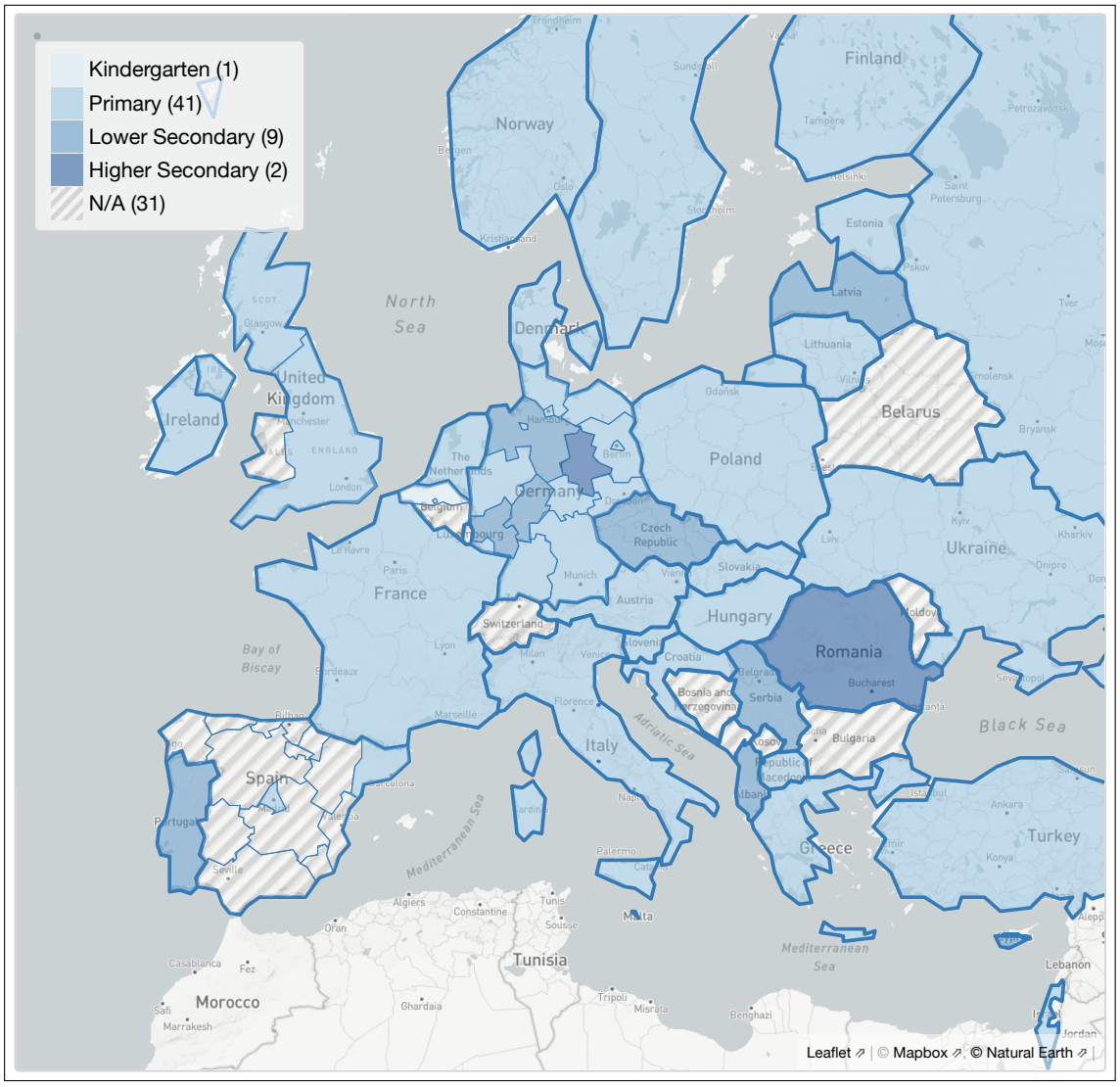
**What percentage of all students typically enrols in Informatics courses in the first two years of secondary education?**



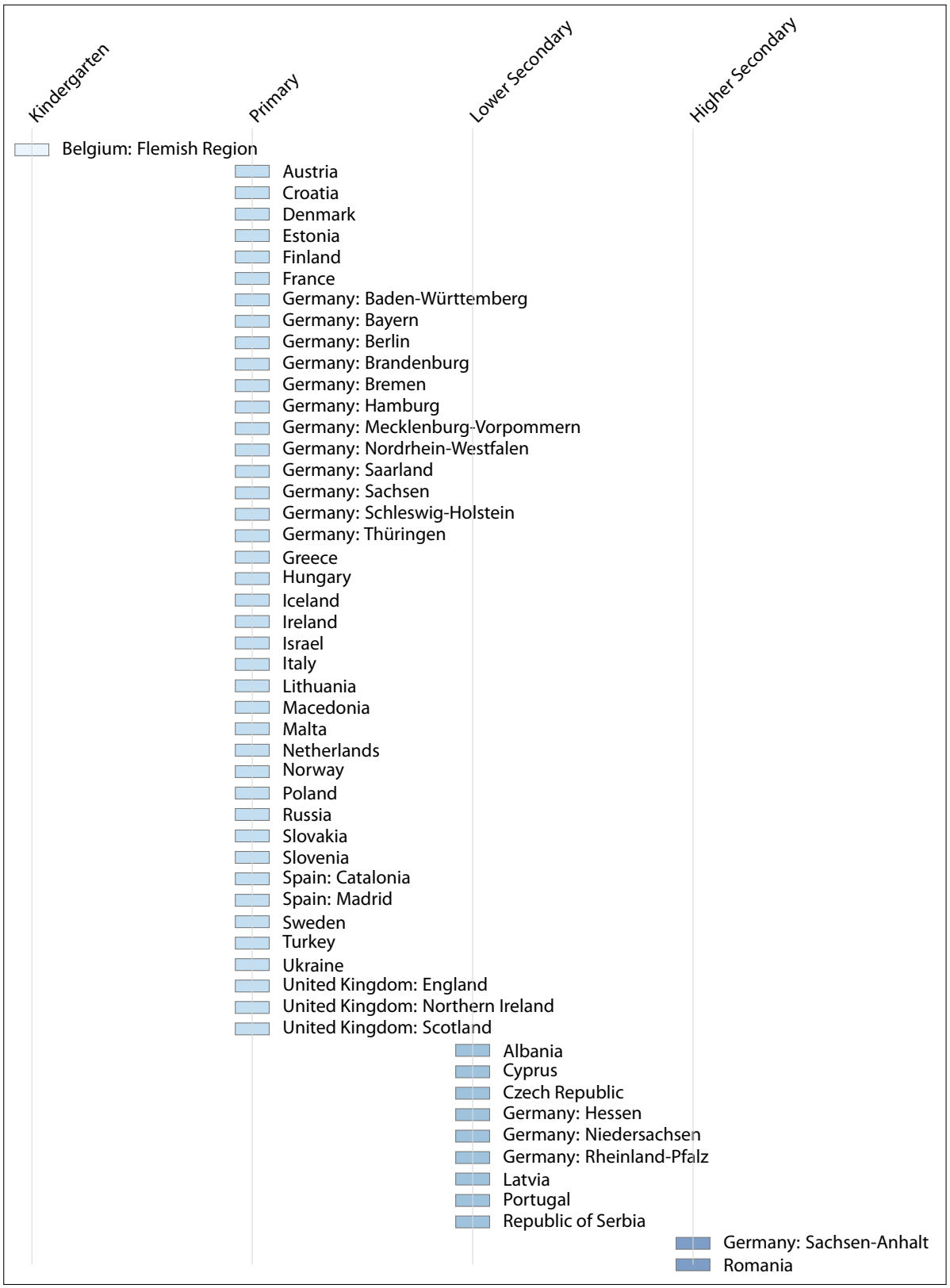
# Digital Literacy: First Contact

**In which year do pupils have their first contact with computers or the internet in schools?**

This map details at which age students currently experience their first contact with Digital Literacy across Europe.



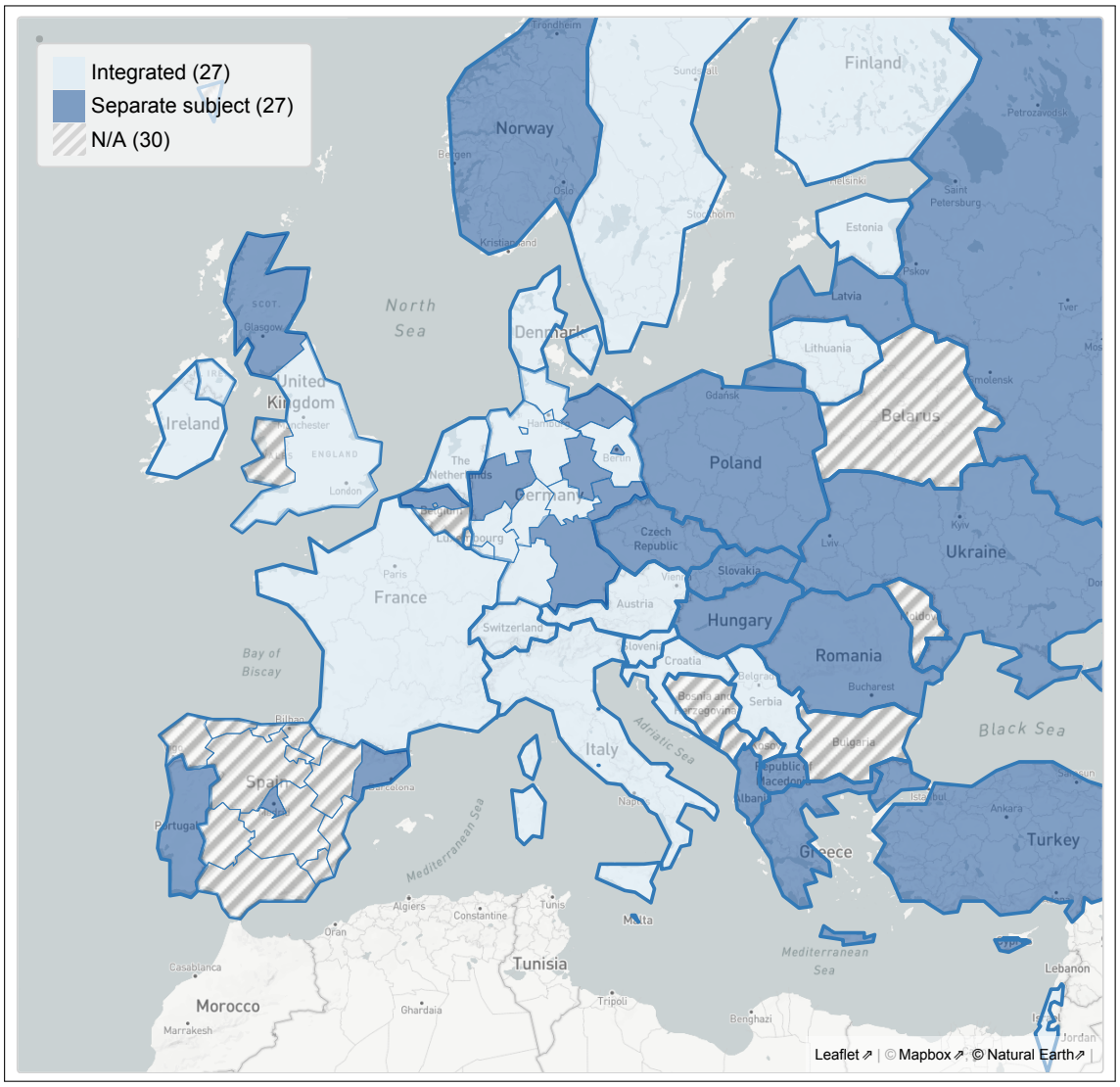
**In which year do pupils have their first contact with computers or the internet in schools?**



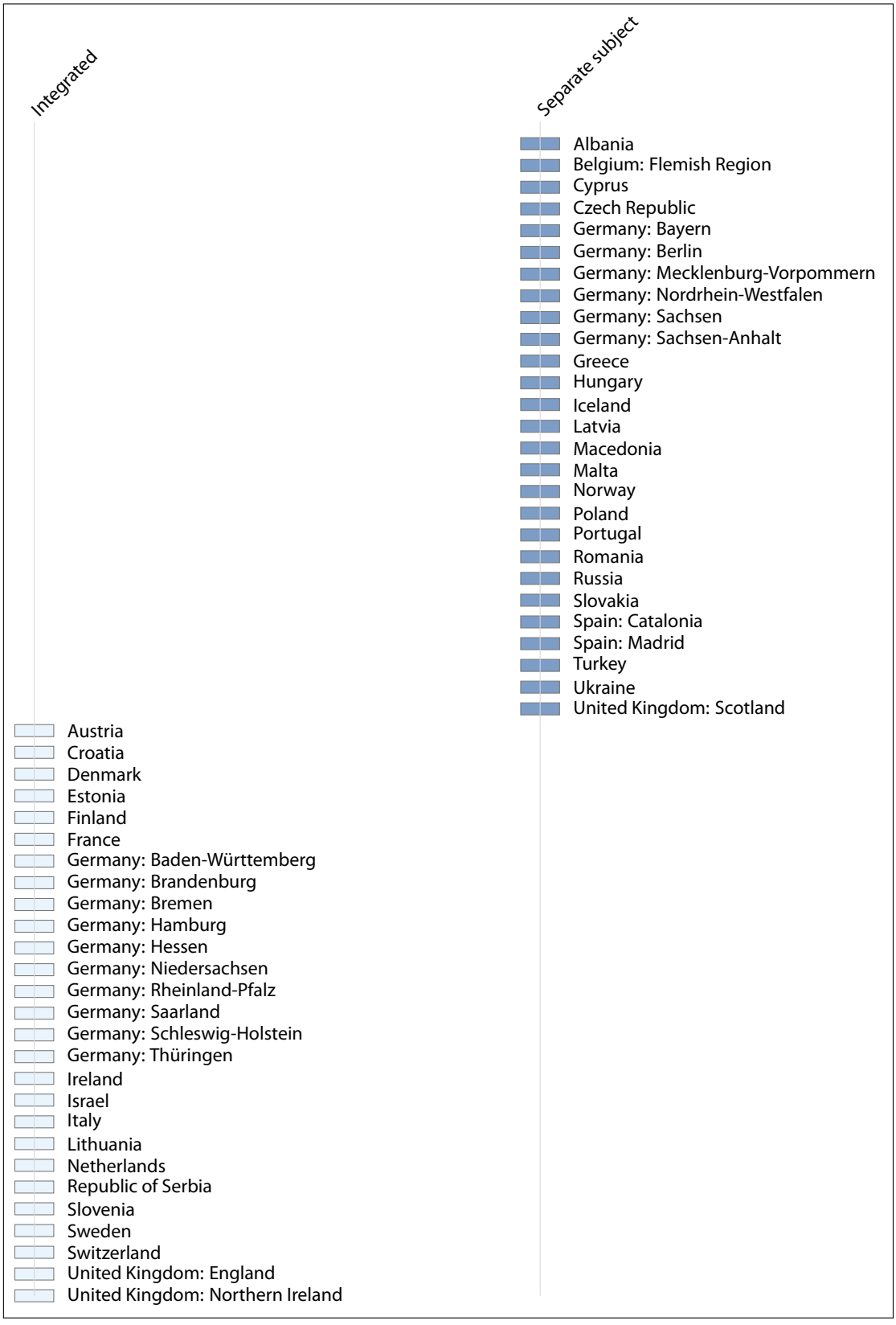
# Digital Literacy: A Separate Subject?

**Is digital literacy a separate subject or is it integrated in other subjects?**

The question of whether or not to teach Digital Literacy as a separate subject or integrated into other subjects has been debated since the 1980s. Arguments in favour of a separate subject include recognition of the importance of Digital Literacy and a more specialised teacher training. On the other hand, Digital Literacy as a separate subject may be seen as an impediment to implementing Informatics as a separate subject as well or, more importantly, contributing to the danger of conflating both subjects. The map indicates in which countries Digital Literacy has been implemented as a separate subject. For countries with different types of secondary schools, data is given for schools leading to university entrance qualification.



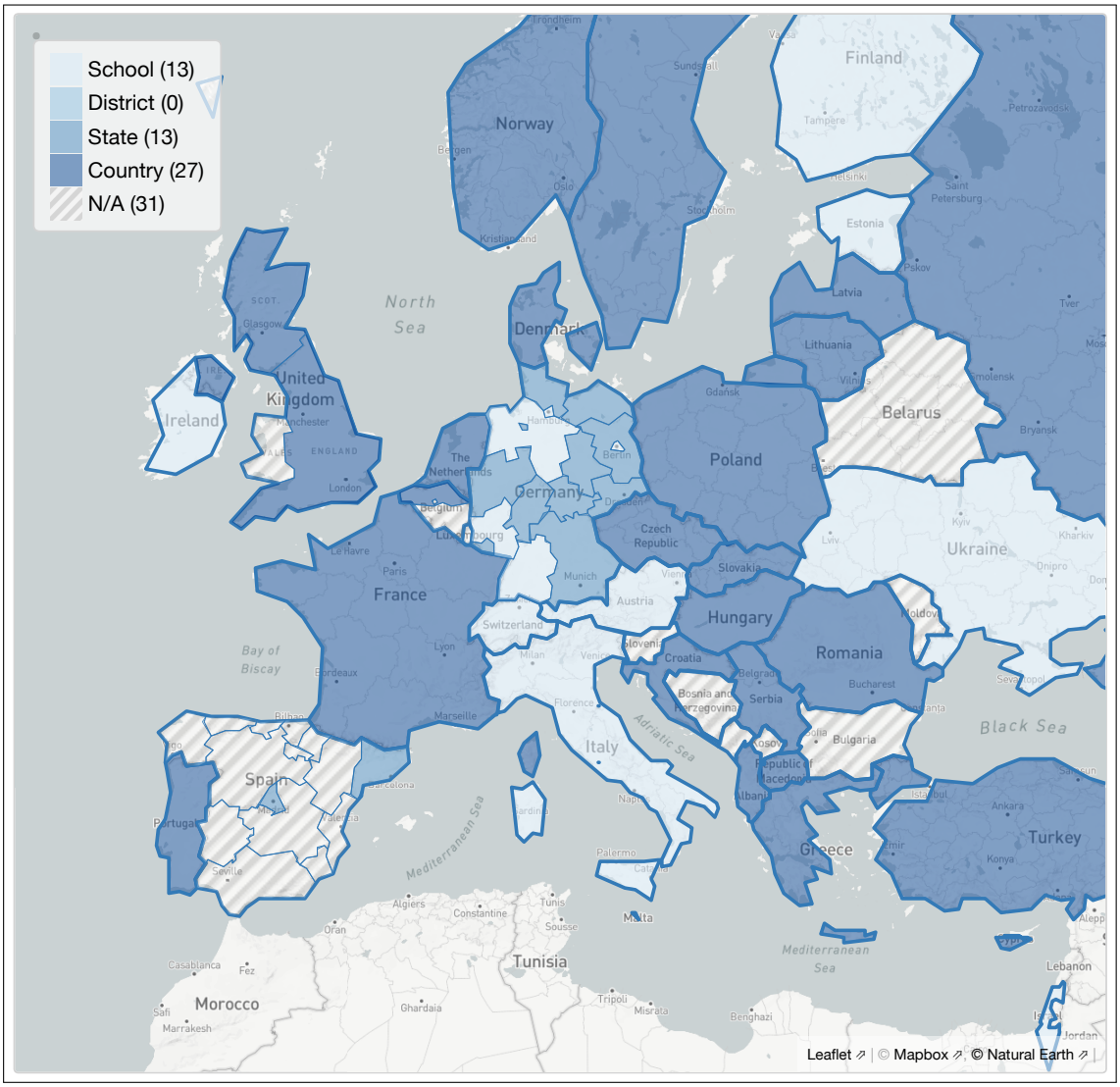
**Is digital literacy a separate subject or is it integrated in other subjects?**



# Digital Literacy: Curriculum Consistency

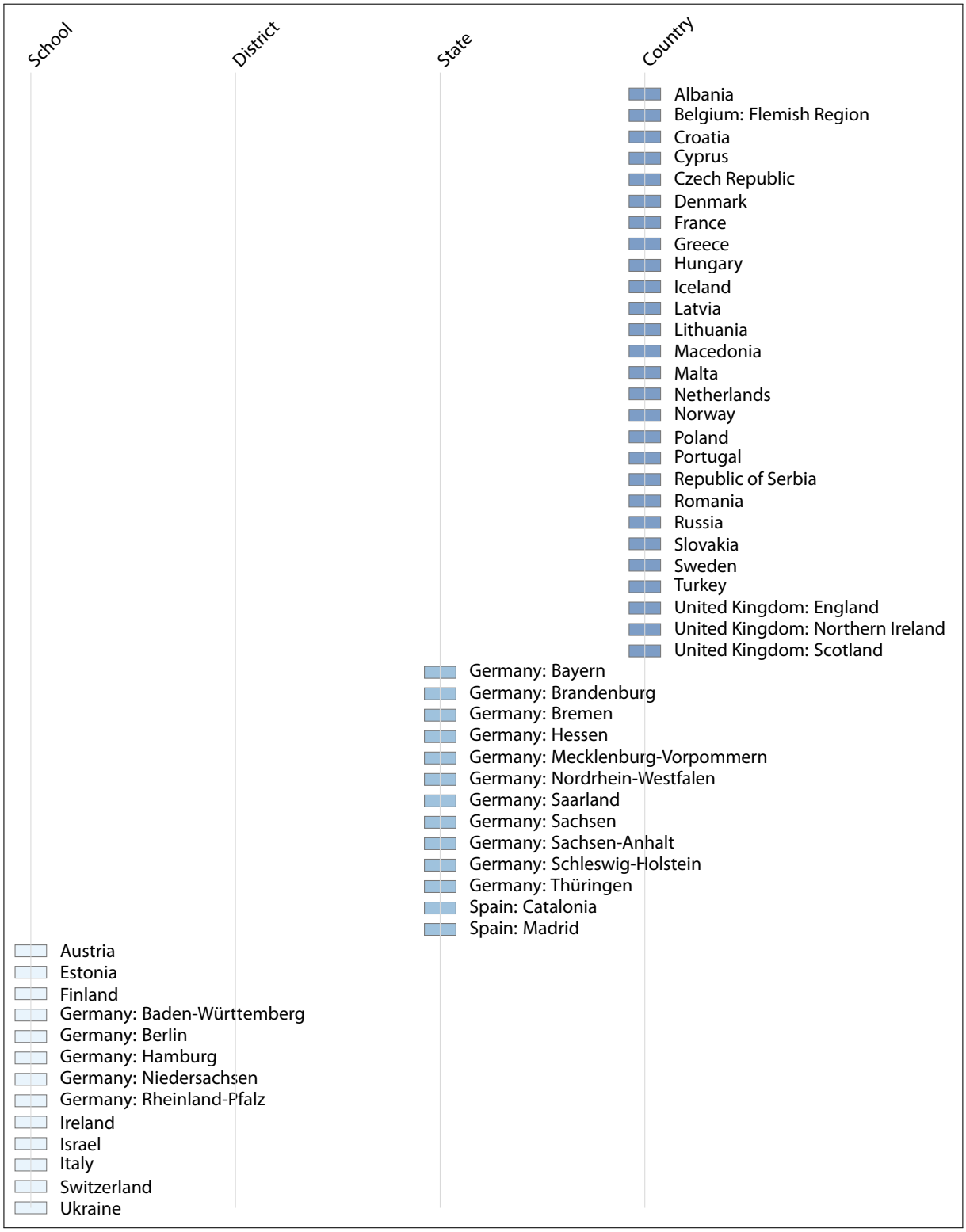
**Is the digital literacy curriculum in your country consistent across all schools or are there local differences?**

Depending on the administrative structure of the respective country, the curriculum for any given subject is defined at different administrative levels. For subjects taught in an integrated way or as electives that do not count towards final grades, exceptions may apply. The map shows at which administrative level decisions regarding a Digital Curriculum are made or, put differently, how much leeway is given to instructors.




For the purposes of this mode description, England, Northern Ireland, Scotland and Wales are regarded as four distinct countries.

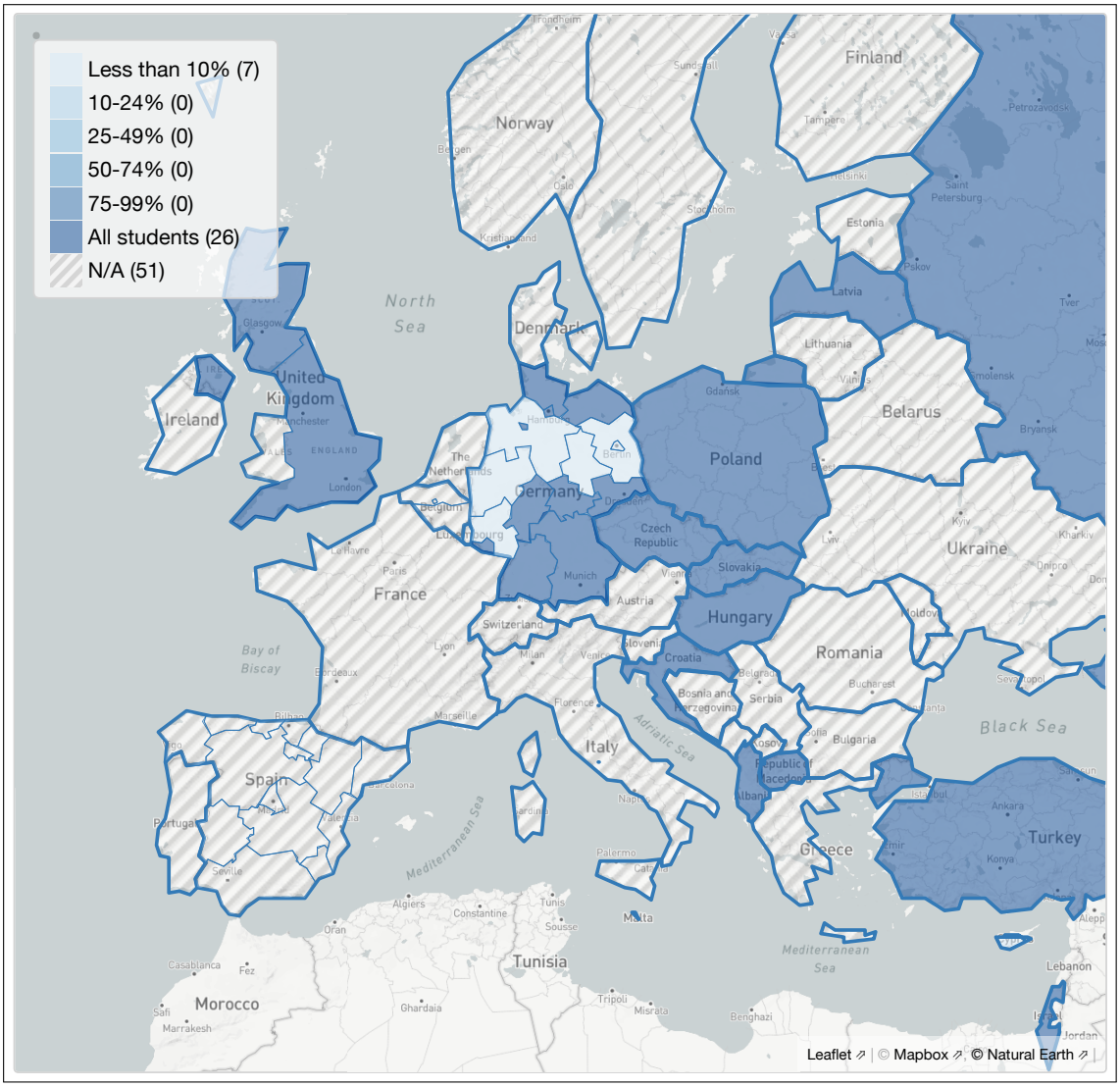
**Is the digital literacy curriculum in your country consistent across all schools or are there local differences?**



# Digital Literacy: Enrolment

**What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education?**

The ACM Europe/Informatics Europe report "Informatics education: Europe cannot afford to miss the boat" recommends that "all students should benefit from education in digital literacy, starting from an early age and mastering the basic concepts by age 12." The map shows what percentage of students is exposed to Digital Literacy during the first two years of secondary education. For countries with different types of secondary schools, data is given for schools leading to university entrance qualification.



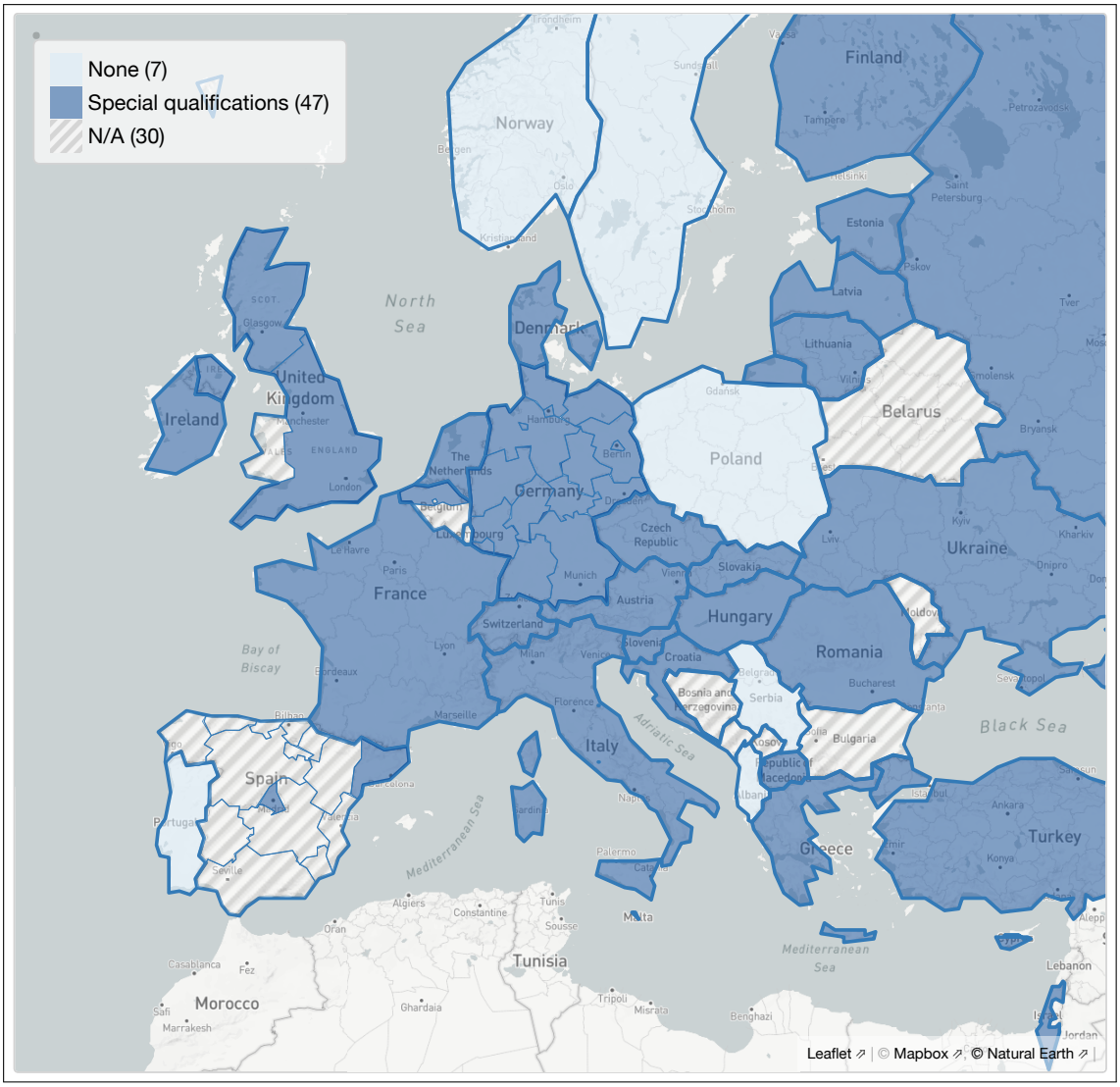

An attempt was made to determine the uptake of Digital Literacy courses. Gathering such information proved to be problematic due to the lack of official statistics being made publically available; the small amount of evidence available was not encouraging. In cases where no data is available, Digital Literacy is usually taught as an integrated subject, maybe even in primary school, so no negative conclusions should be drawn here.
Reliable data is given in cases where Digital Literacy is compulsory as a stand-alone subject, i.e., 100% enrolment, or not being offered at all, i.e., 0% enrolment.

**What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education?**

# Teacher Training: Special Qualifications

**Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers?**

Unlike "established" disciplines, Informatics courses are sometimes taught by personnel that has not received formal teacher training, i.e. training including both subject matter and pedagogical content knowledge in Informatics. Instead, several countries rely on in-service certification courses or on hiring IT professionals. The map indicates which model of training for Informatics teachers is followed in each country.

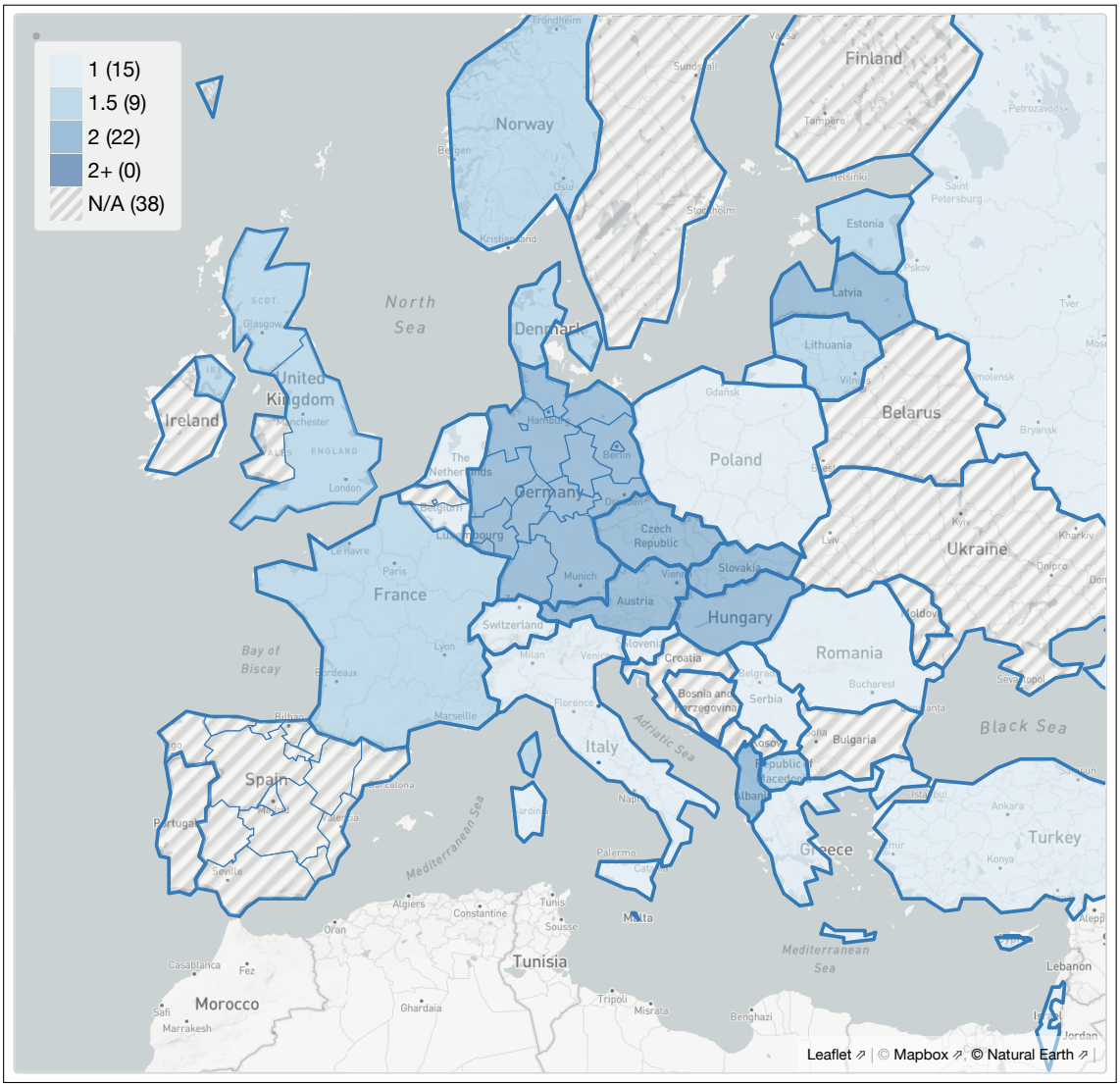


**Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers?**

# Teacher Training: Number of Subjects

**In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects?**

There are different models of teacher training depending on how many subjects secondary school teachers are qualified in. This map shows which model is followed in each country.



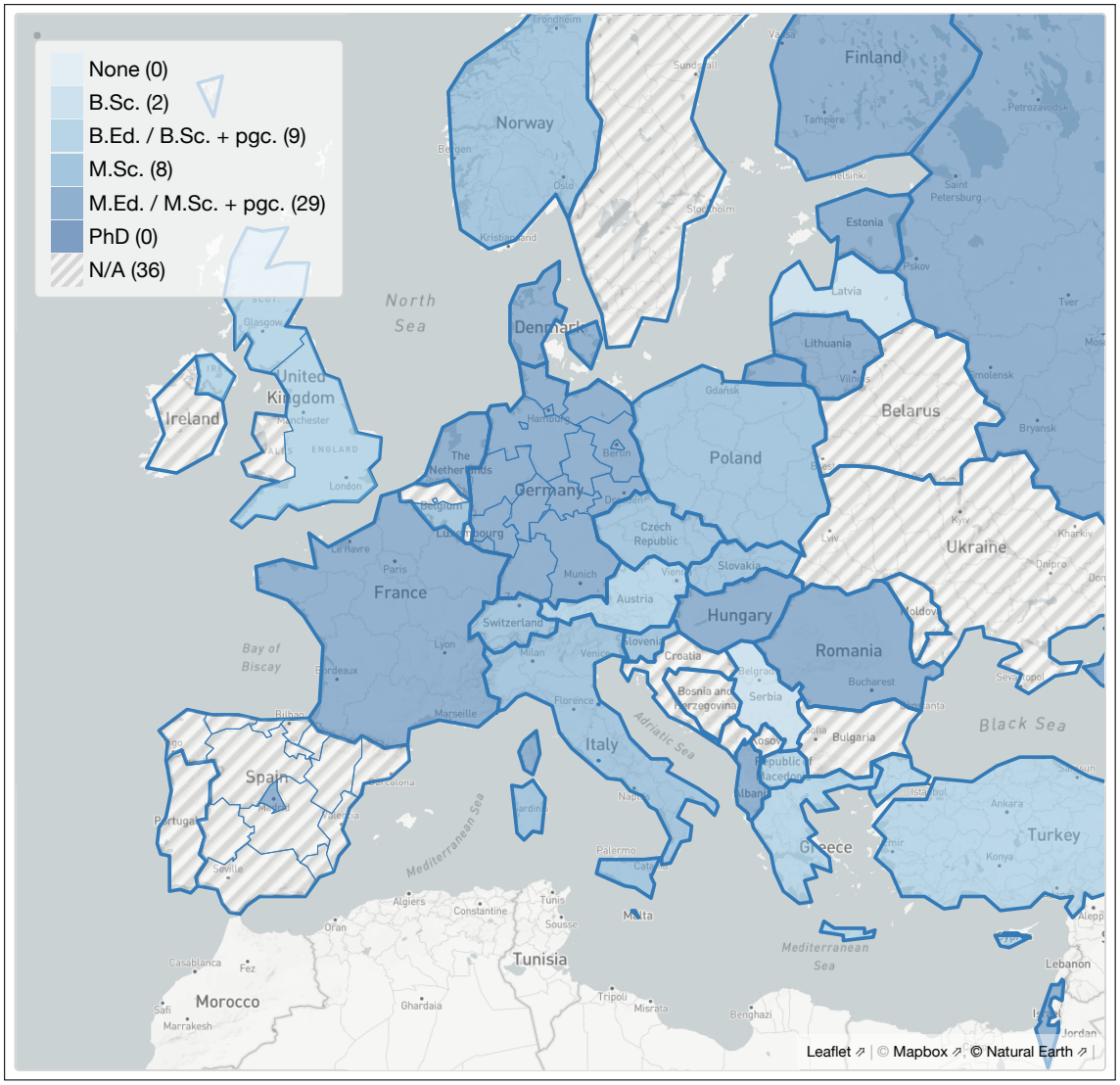

**1:** One subject.
**1.5:** One major subject, one minor subject.
**2:** Two subjects.
**2+:** More than two subjects.

**In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects?**

# Teacher Training: Entry Requirement

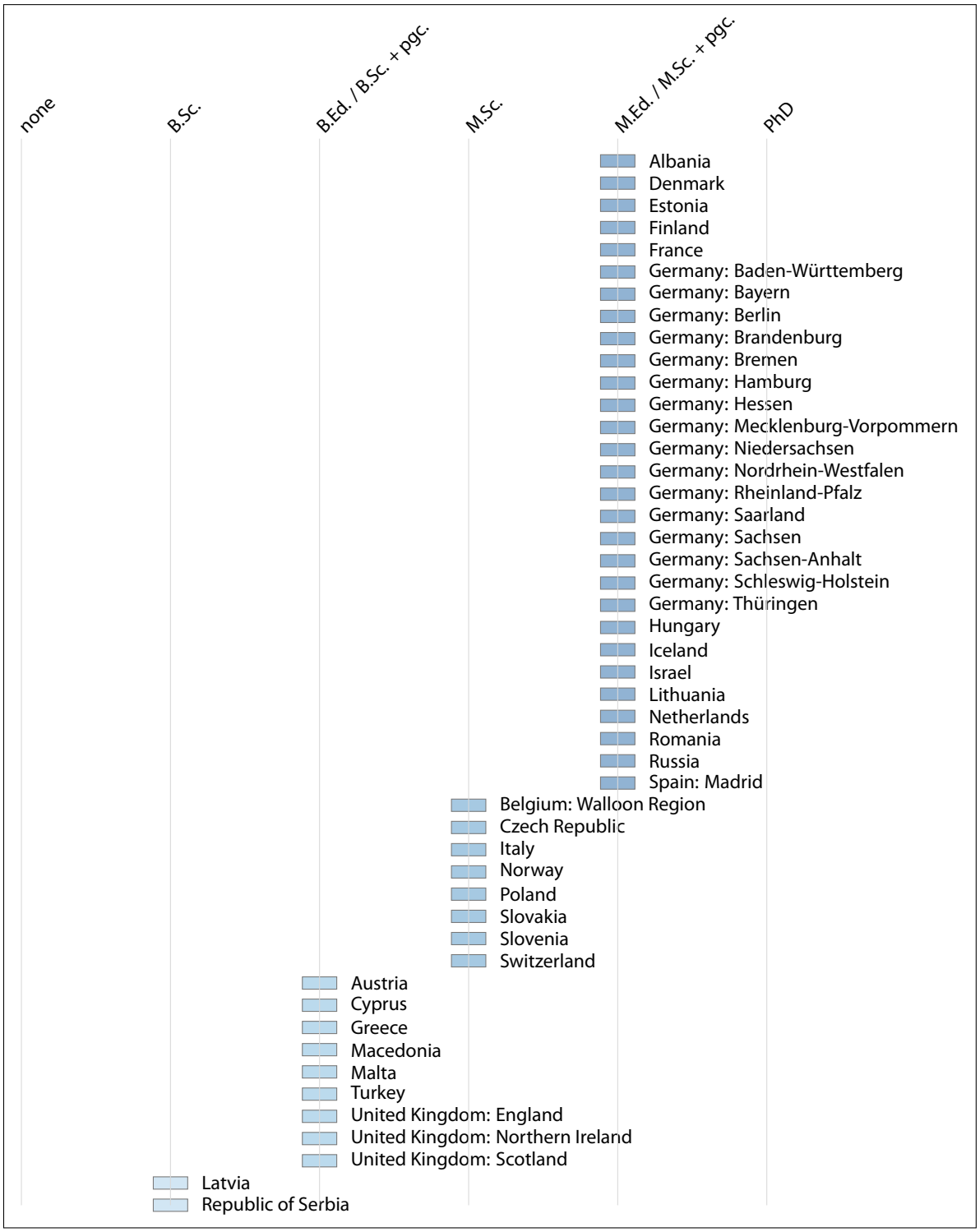
**What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)?**

This map shows the formal, i.e. academic, entrance requirement for the teaching profession.




| | |
|---|---|
| **B.Sc.:** | Bachelor of Science. |
| **B.Ed. / B.Sc. + pgc.:** | Bachelor of Education or Bachelor of Science with postgraduate certificate. |
| **M.Sc.:** | Master of Science. |
| **M.Ed. / M.Sc. + pgc.:** | Master of Education or Master of Science with postgraduate certificate. |
| **PhD.:** | Doctor of Philosophy. |

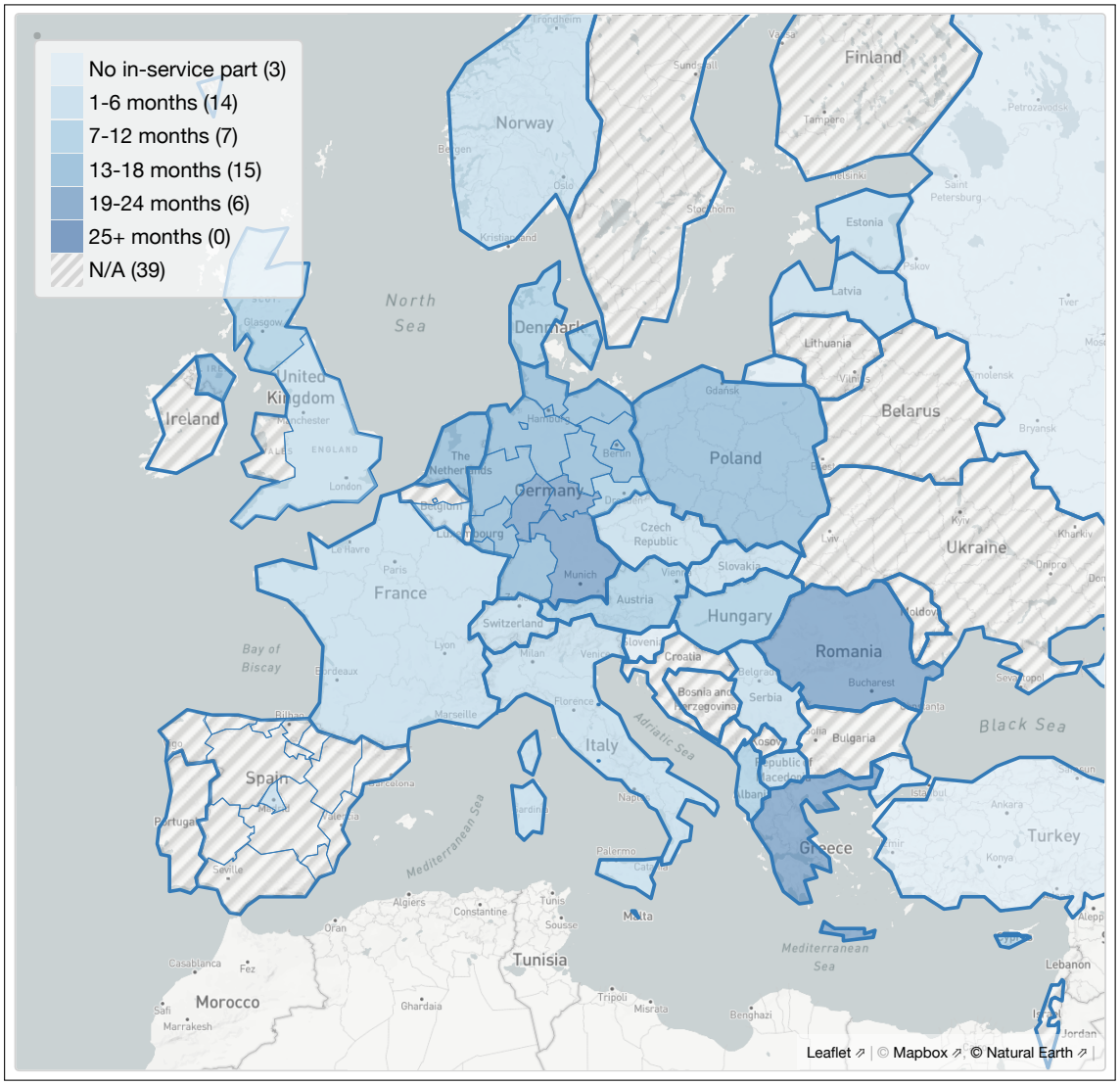
**What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)?**



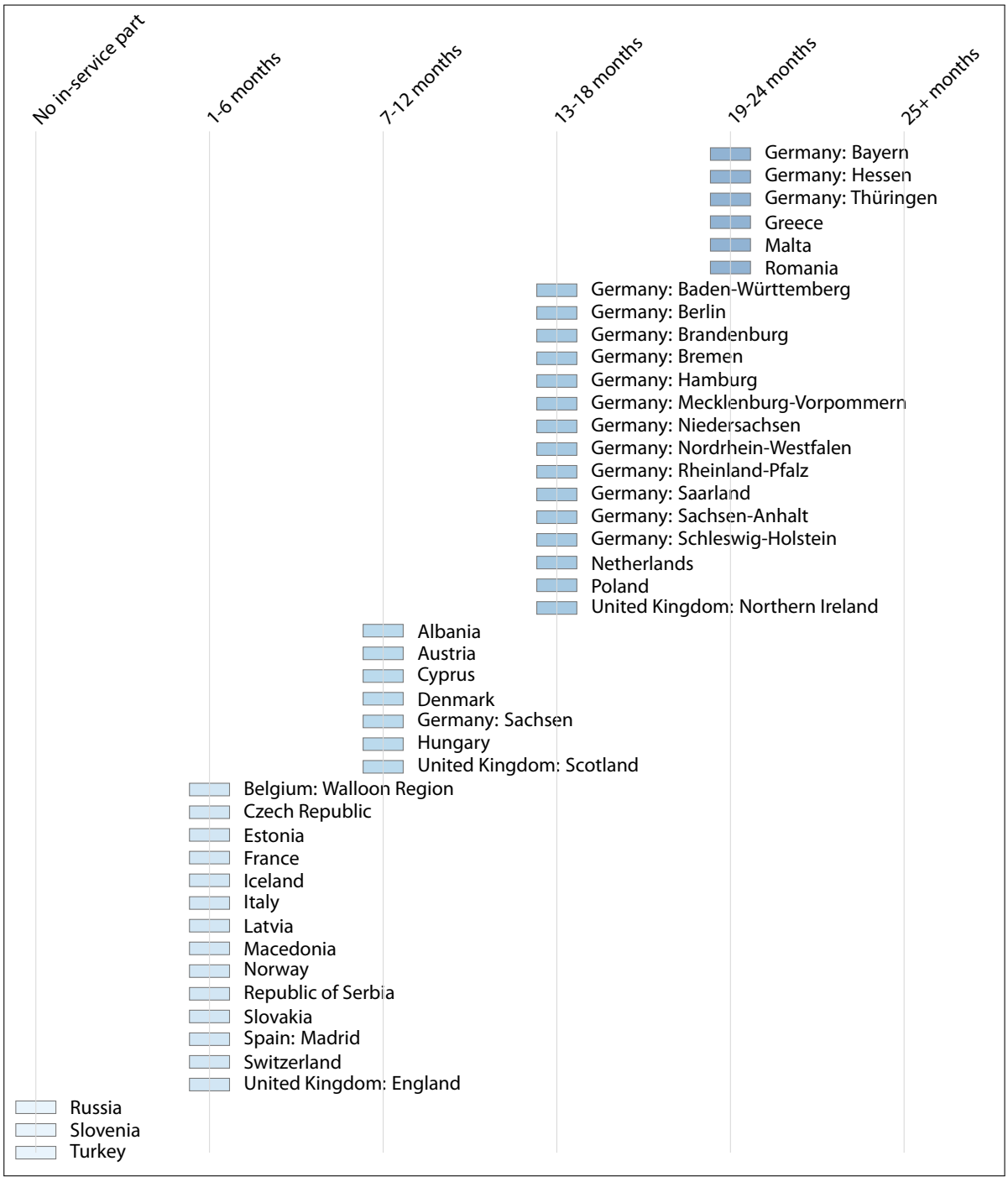
# Teacher Training: In-Service Length

**How long is the in-service part of teacher training across all subjects?**

In most cases, the formal, academic training of prospective teachers is complemented by in-service training. This map shows the duration of such training (if required) for each country.

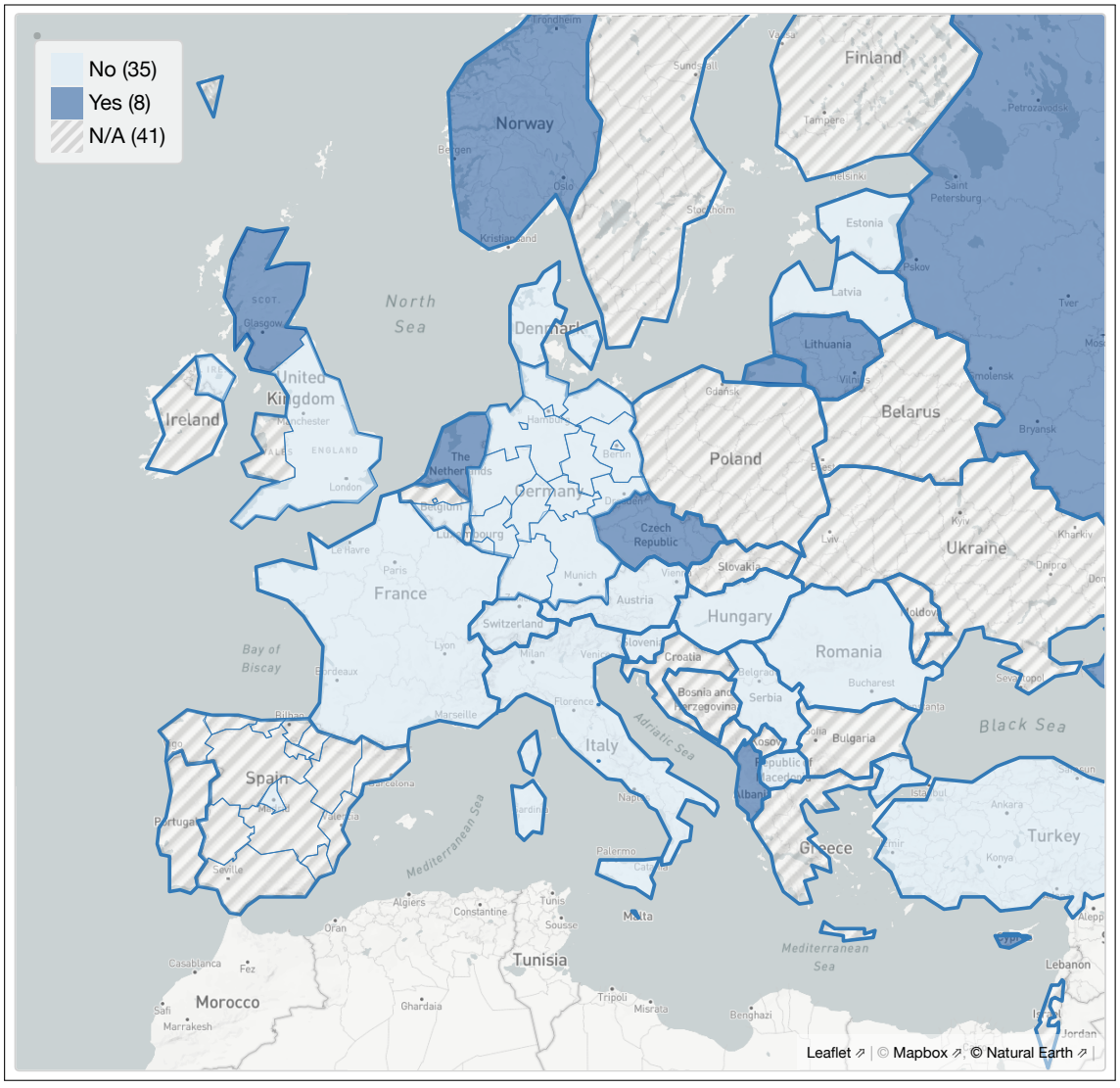


**How long is the in-service part of teacher training across all subjects?**



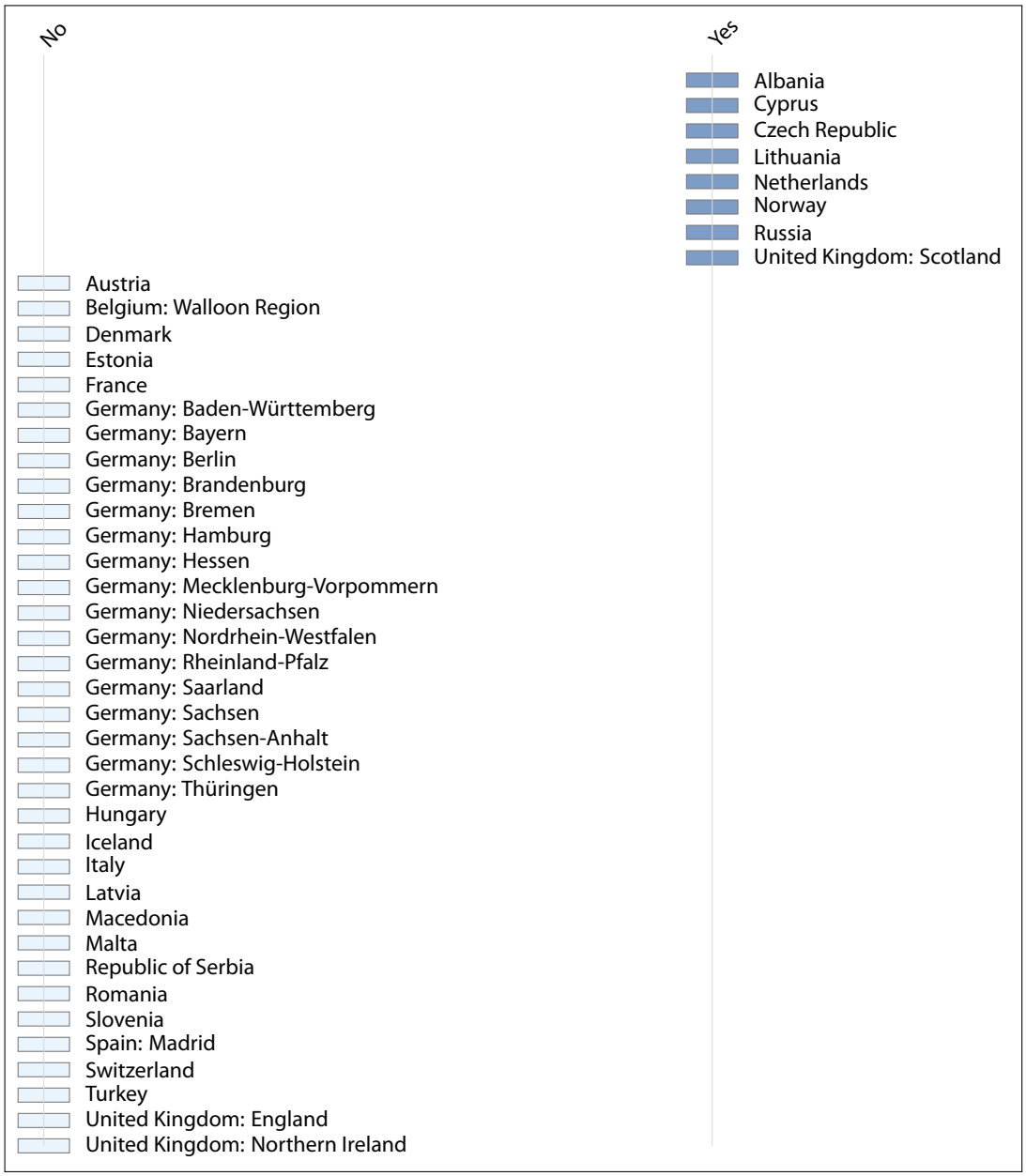
**Is there a stand-alone curriculum in teacher training? (Digital Literacy)**

This map shows whether there is a stand-alone Digital Literacy curriculum in teacher training, i.e. whether teachers are exposed to a formal, stand-alone Digital Literacy training. Note that this is independent of whether or not Digital Literacy is taught as a stand-alone subject or integrated in other subjects in schools.



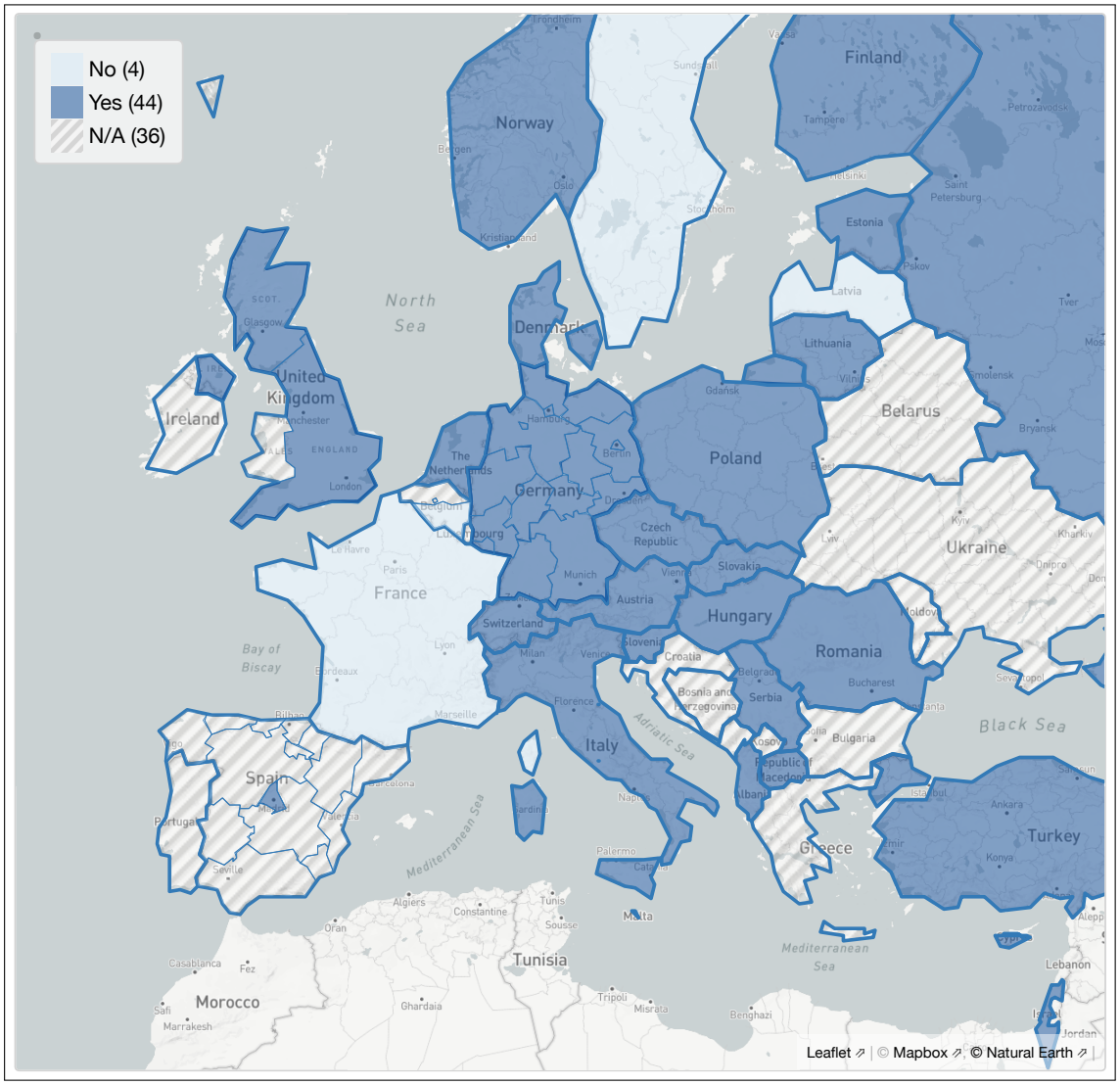

The question asked about a stand-alone curriculum in Digital Literacy used in a course of study leading to a degree or certificate related to teaching Digital Literacy. Whether or not teacher training contains modules on Digital Literacy and how to teach it, could not be surveyed as defining the modules in the implementation of teacher training curricula is usually done on the level of the academic institutions. Hence, no statements regarding the situation on the level of regions or countries could be derived.

**Is there a stand-alone curriculum in teacher training? (Digital Literacy)**



**Is there a stand-alone curriculum in teacher training? (Informatics)**

This map shows whether there is a stand-alone Informatics curriculum in teacher training, i.e., whether students are able to study Informatics for the teaching profession.

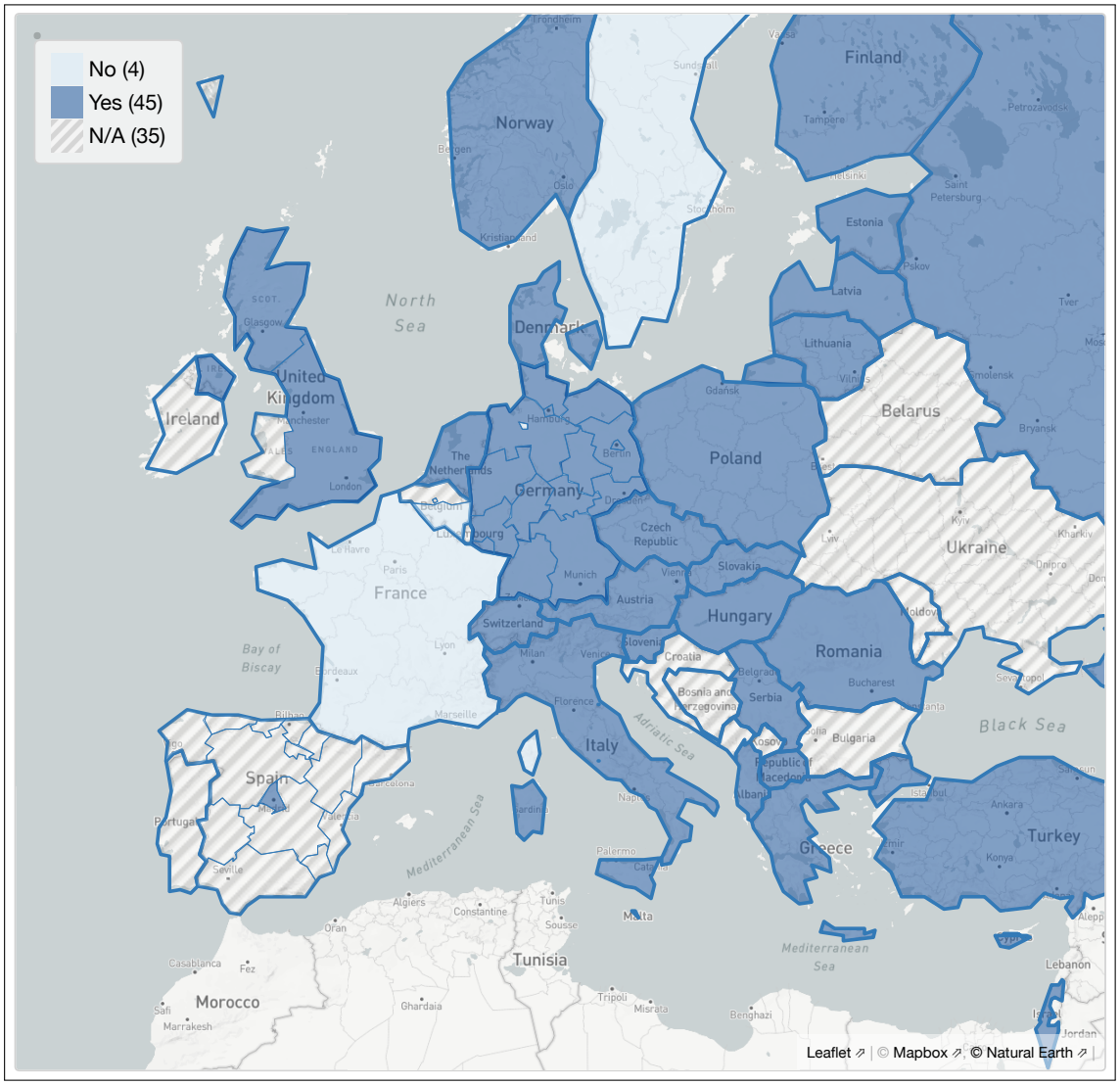


**Is there a stand-alone curriculum in teacher training? (Informatics)**

# Teacher Training: Typical Path Availability

**Is the typical training path for a secondary school teacher also available in Informatics?**

This map shows whether Informatics can be studied as a subject for the teaching profession just like any other subject, e.g. Mathematics.

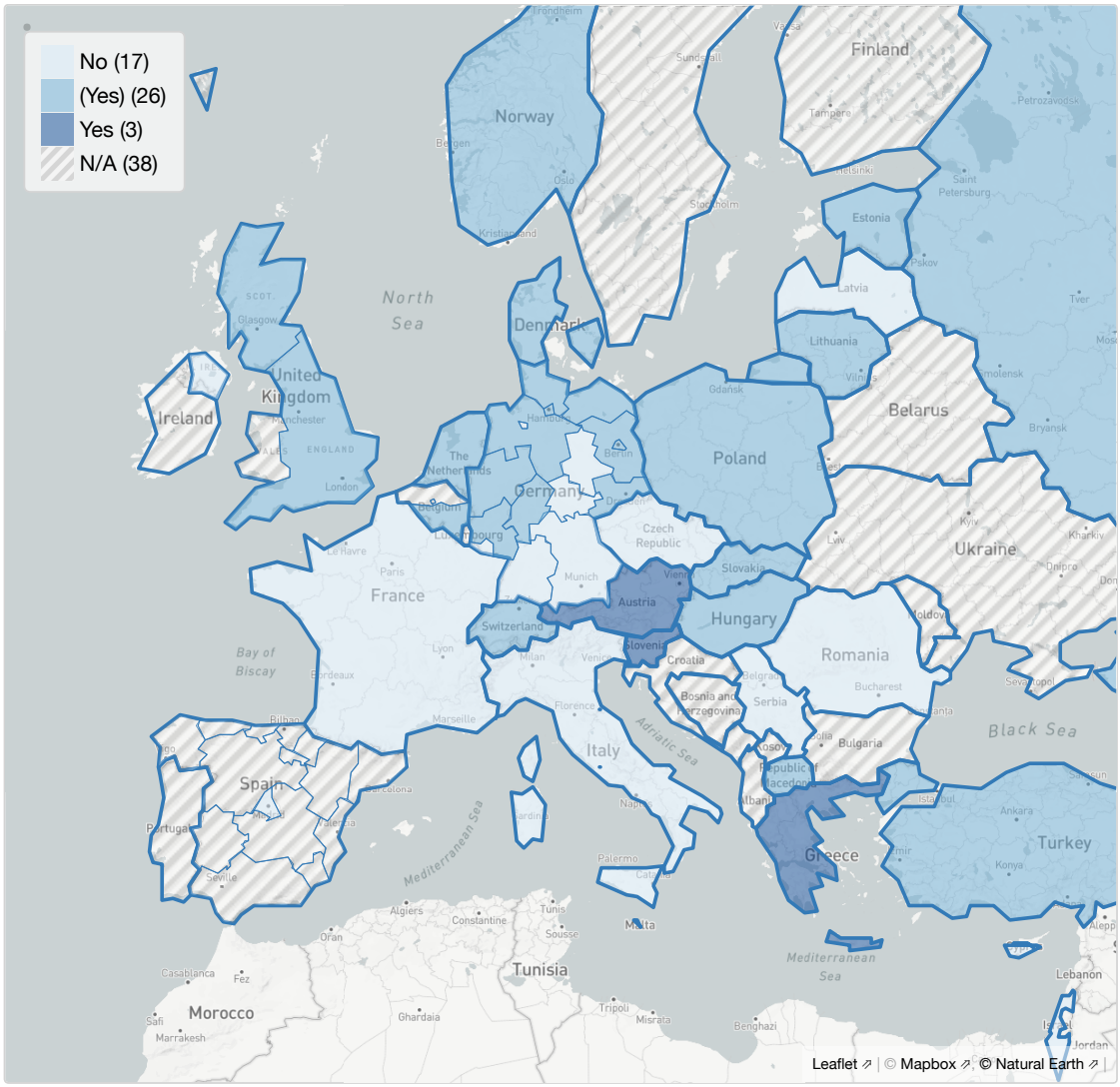


**Is the typical training path for a secondary school teacher also available in Informatics?**

# Teacher Training: Professionals as Teachers

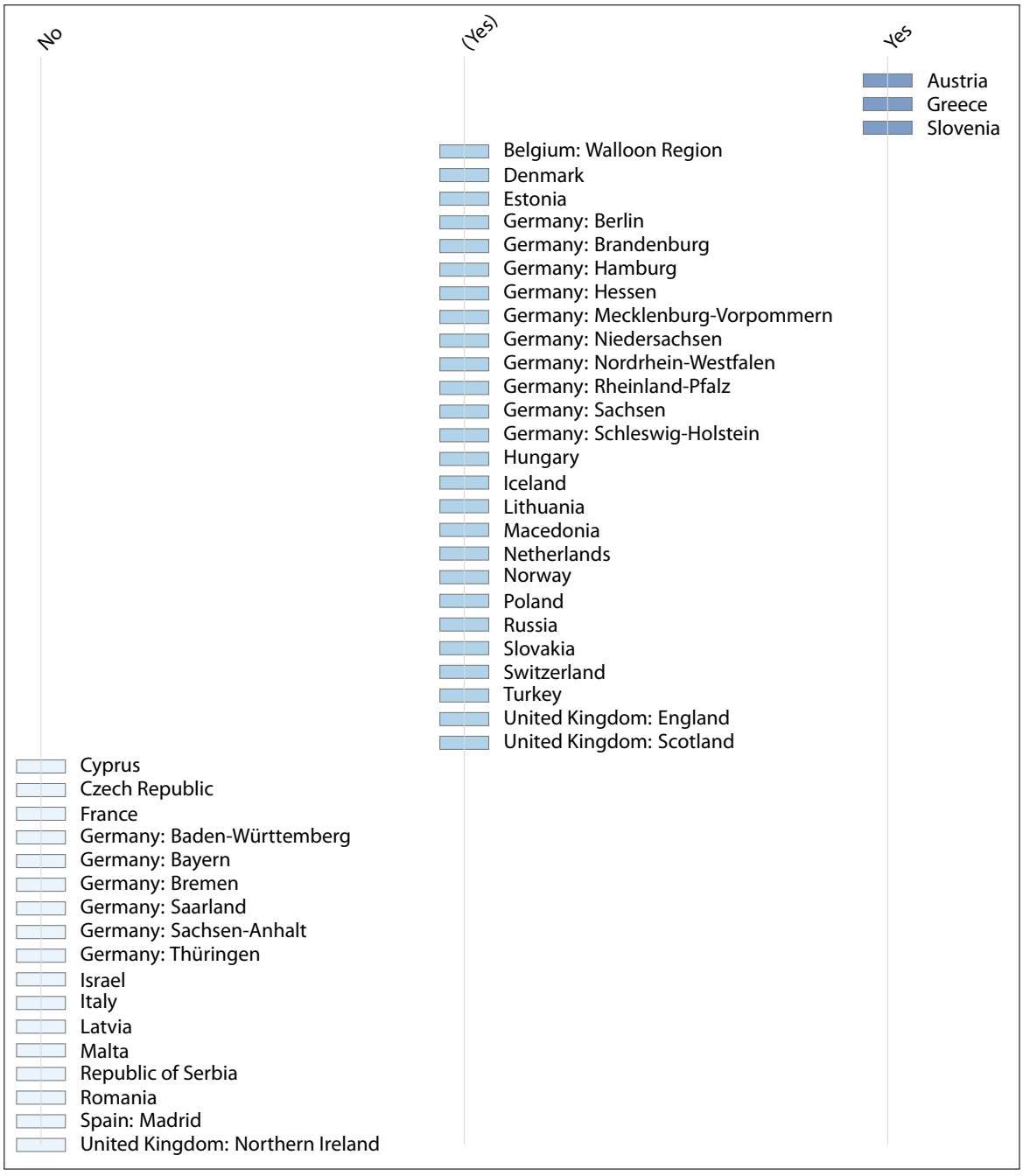
**Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher?**

In recent years, it has been suggested that professionals may be hired, at least for a short period of time, to bootstrap Informatics classes in secondary schools by team-teaching with in-service teachers. Also, a professional may want to change career and enter the teaching profession. This map shows to which extent a non-teaching-related academic degree in Informatics together with professional experience can be used to waive the educational training usually required for teachers.




**No:** Teaching is not possible without the standard entry requirements.
**(Yes):** Teaching is possible after having obtained a didactical certificate.
**Yes:** Teaching is possible without any extra requirements.

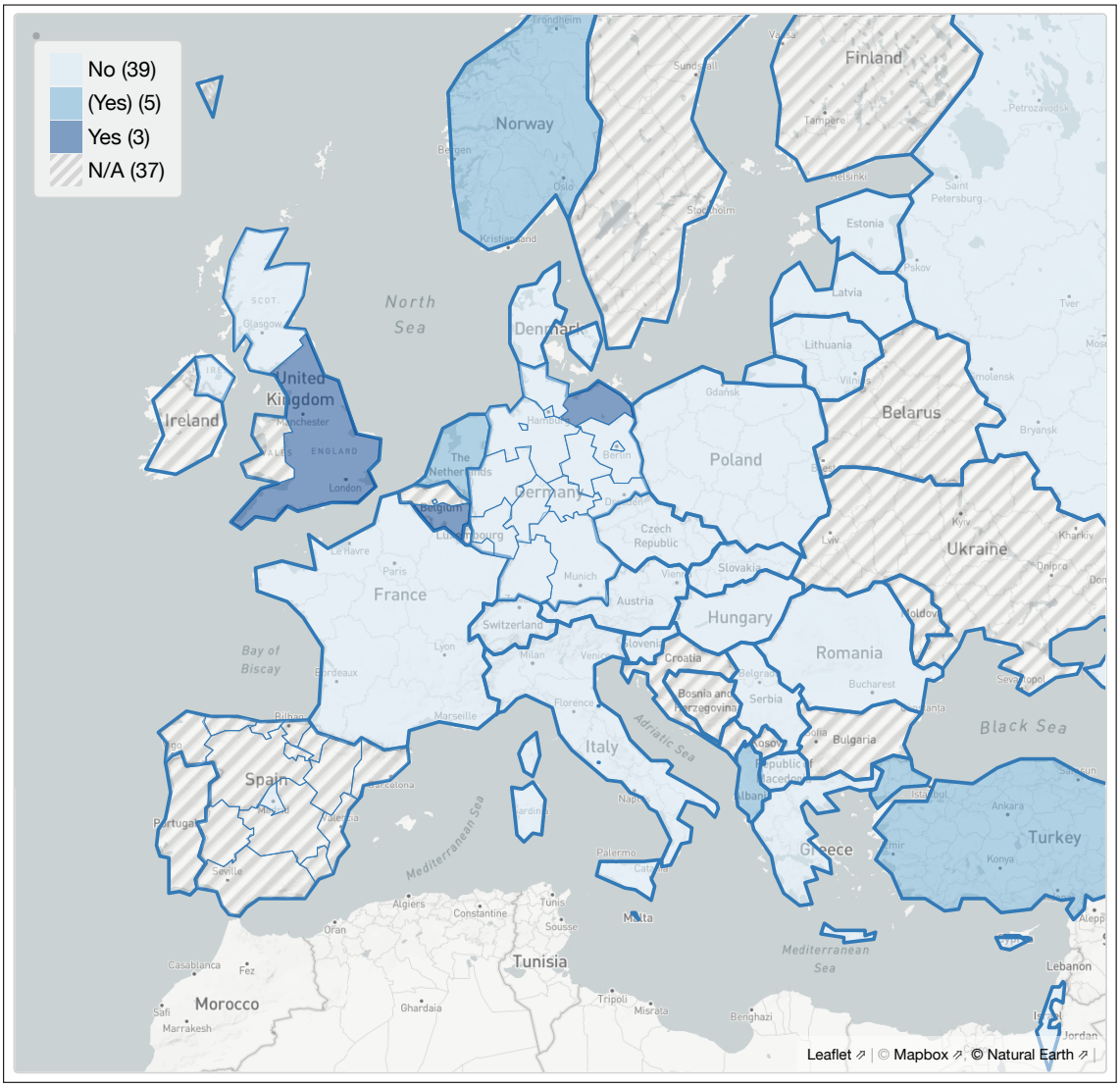
**Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher?**



# Teacher Training: Professional Experience

**Can professional experience can be used to waive the formal subject qualifications typically required?**

In recent years, it has been suggested that professionals may be hired, at least for a short period of time, to bootstrap Informatics classes in secondary schools by team-teaching with in-service teachers. Also, a professional may want to change career and enter the teaching profession. This map shows to which extent professional experience can be used to waive the formal subject qualifications training usually required for teachers. For educational requirements, see this section.



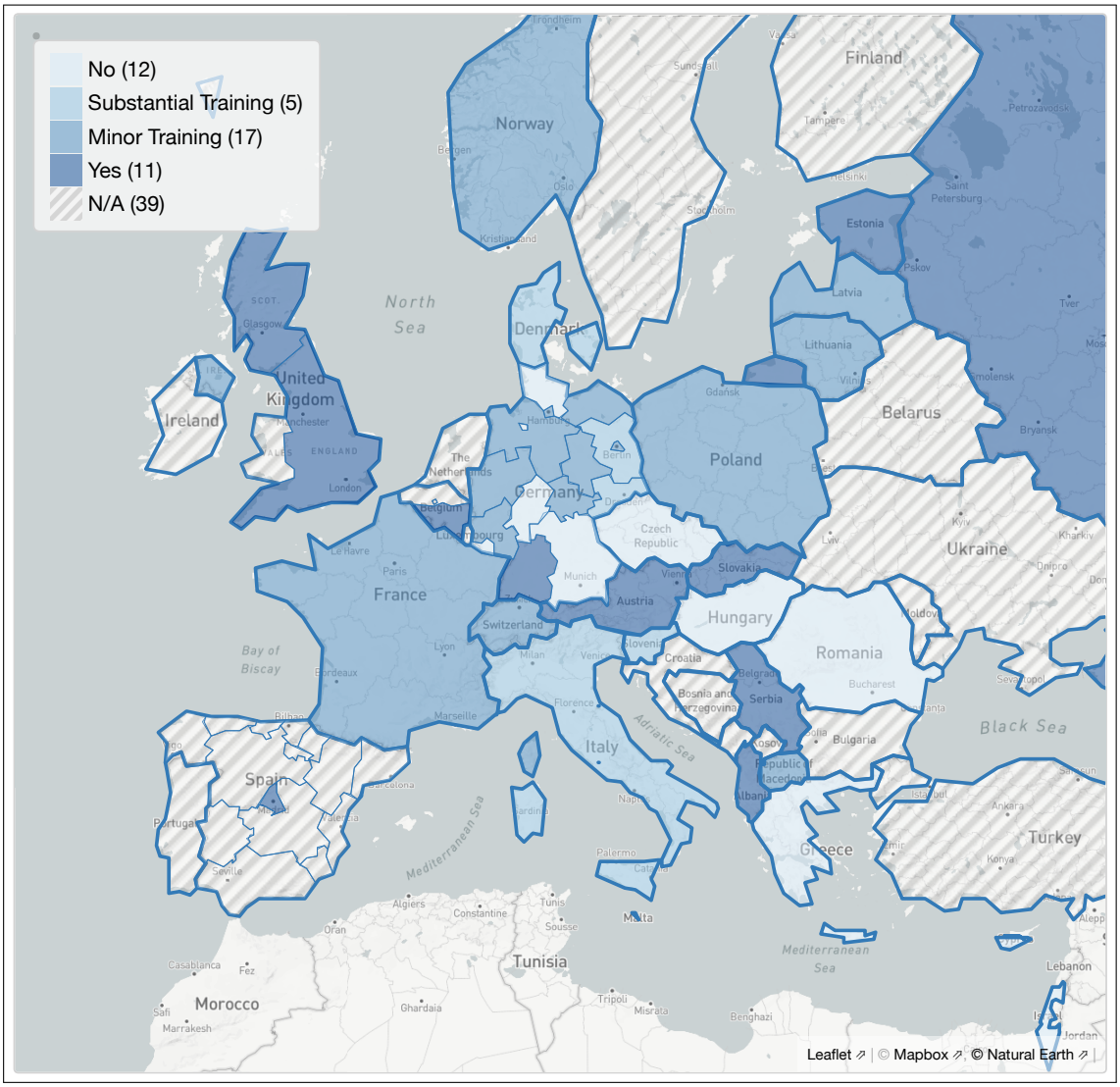

**No:** Teaching is not possible without the standard entry requirements.
**(Yes):** Teaching is possible after having obtained a subject-matter certificate.
**Yes:** Teaching is possible without any extra requirements.

**Can professional experience can be used to waive the formal subject qualifications typically required?**

# Teacher Training: Mathematics Teachers

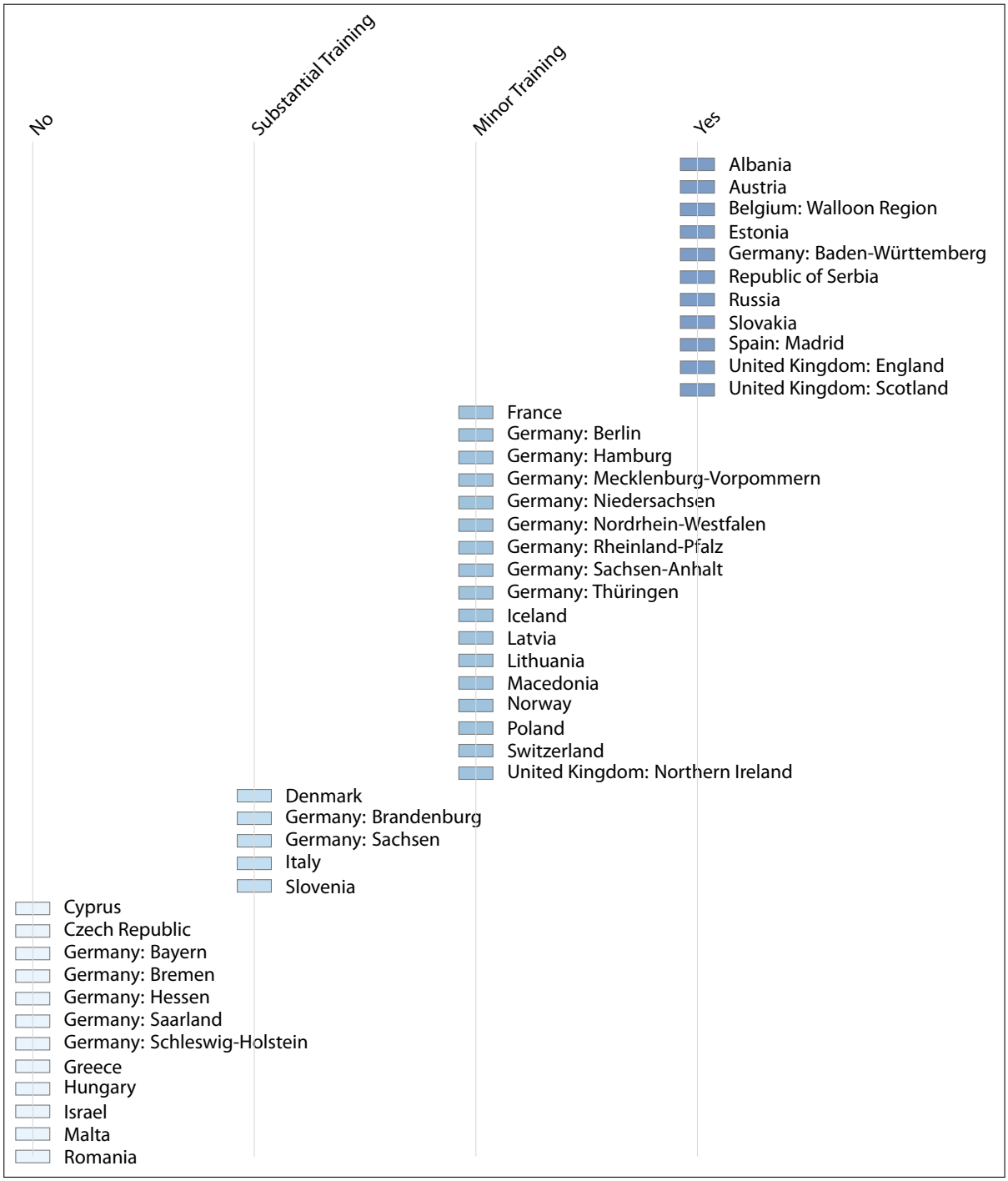
**Is it possible to teach Informatics if you are a Mathematics teacher?**

To be able to offer Informatics classes even in the absence of fully trained Informatics teachers, schools may chose to (re-)train in-service teachers as part of continued professional development to teach Informatics classes. This map shows whether this option is available to Mathematics teachers and - if so - which amount of additional training in Informatics is required. For countries with different types of secondary schools, data is given for schools leading to university entrance qualification.




| | |
|---|---|
| **No:** | Teaching is not possible without a full training as an Informatics teacher. |
| **Substantial Training:** | Teaching is possible after having completed a substantial re-training. |
| **Minor Training:** | Teaching is possible after having completed a minor re-training. |
| **Yes:** | Teaching is possible without any extra requirements. |

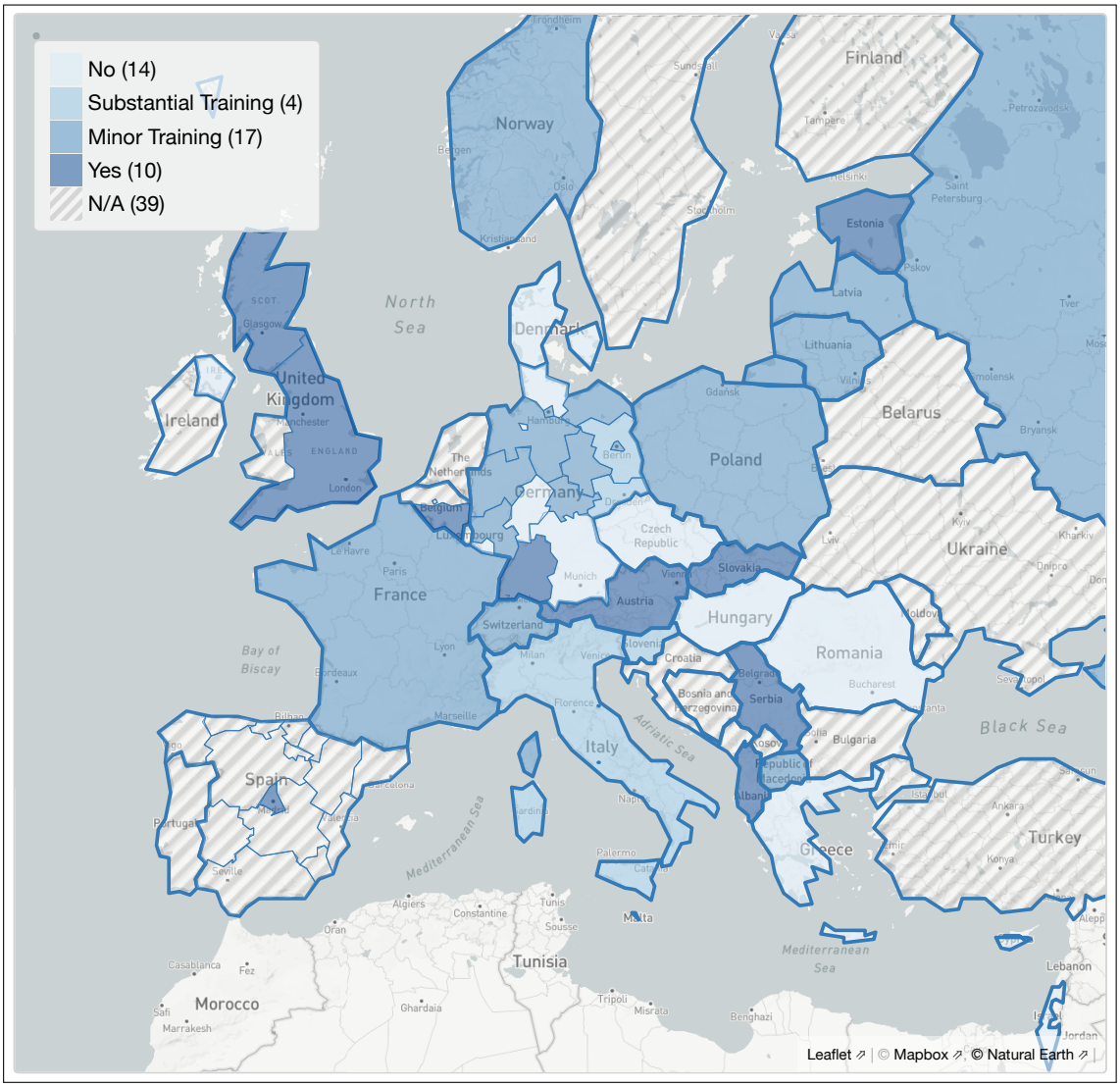
**Is it possible to teach Informatics if you are a Mathematics teacher?**



# Teacher Training: Physics Teachers

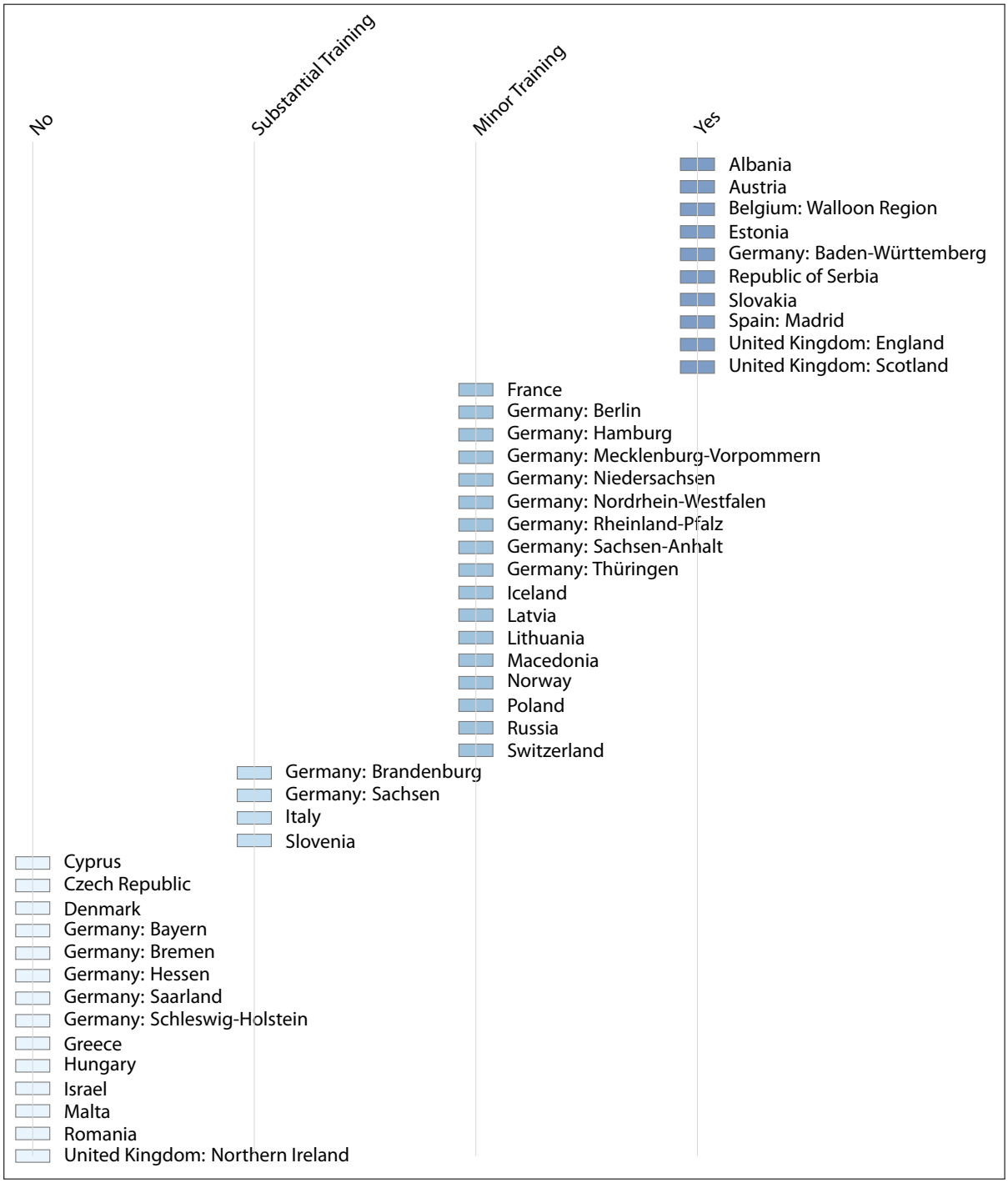
**Is it possible to teach Informatics if you are a Physics teacher?**

To be able to offer Informatics classes even in the absence of fully trained Informatics teachers, schools may chose to (re-)train in-service teachers as part of continued professional development to teach Informatics classes. This map shows whether this option is available to Physics teachers and - if so - which amount of additional training in Informatics is required. For countries with different types of secondary schools, data is given for schools leading to university entrance qualification.




| | |
|---|---|
| **No:** | Teaching is not possible without a full training as an Informatics teacher. |
| **Substantial Training:** | Teaching is possible after having completed a substantial re-training. |
| **Minor Training:** | Teaching is possible after having completed a minor re-training. |
| **Yes:** | Teaching is possible without any extra requirements. |

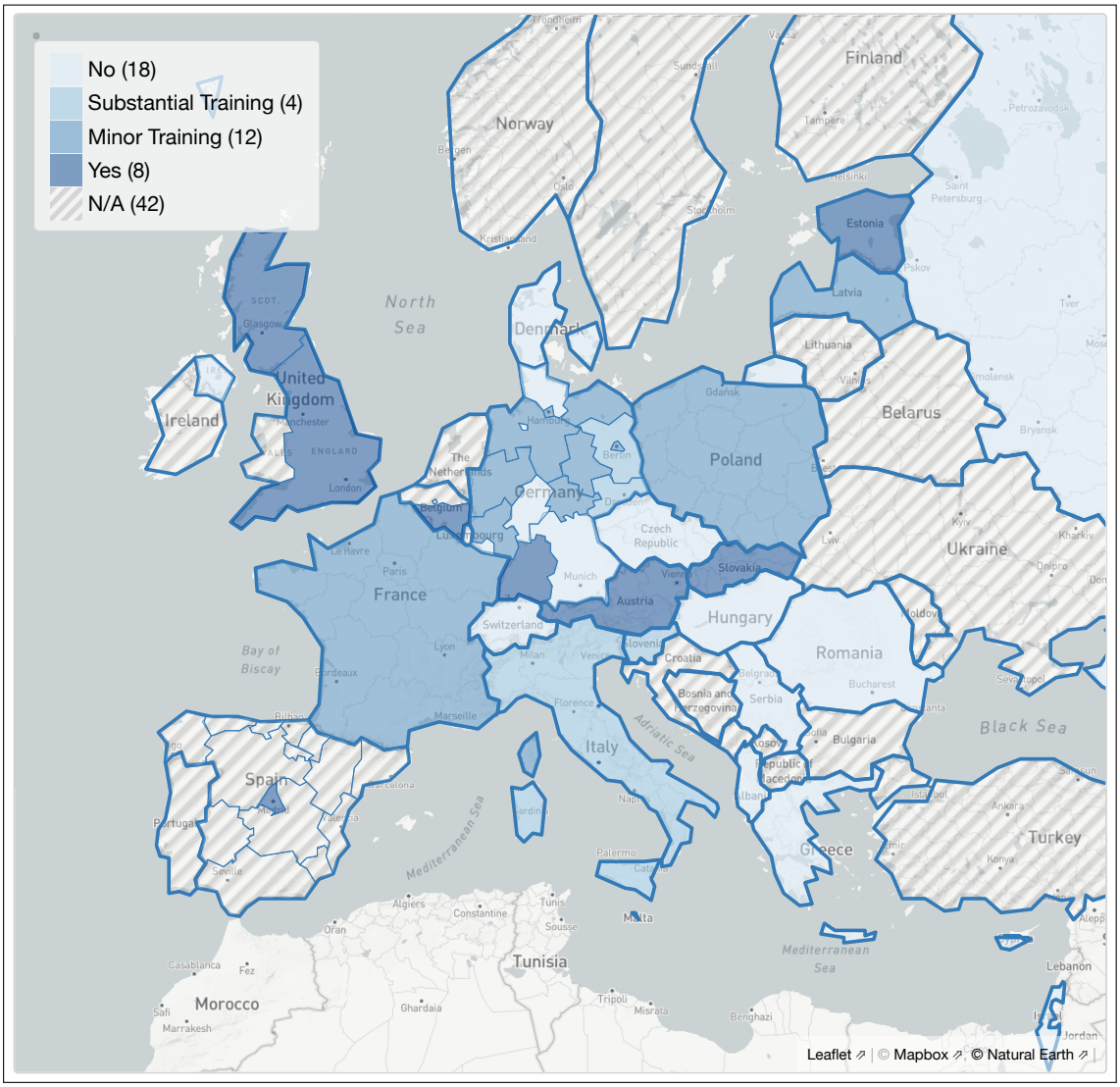
**Is it possible to teach Informatics if you are a Physics teacher?**



# Teacher Training: Business Teachers

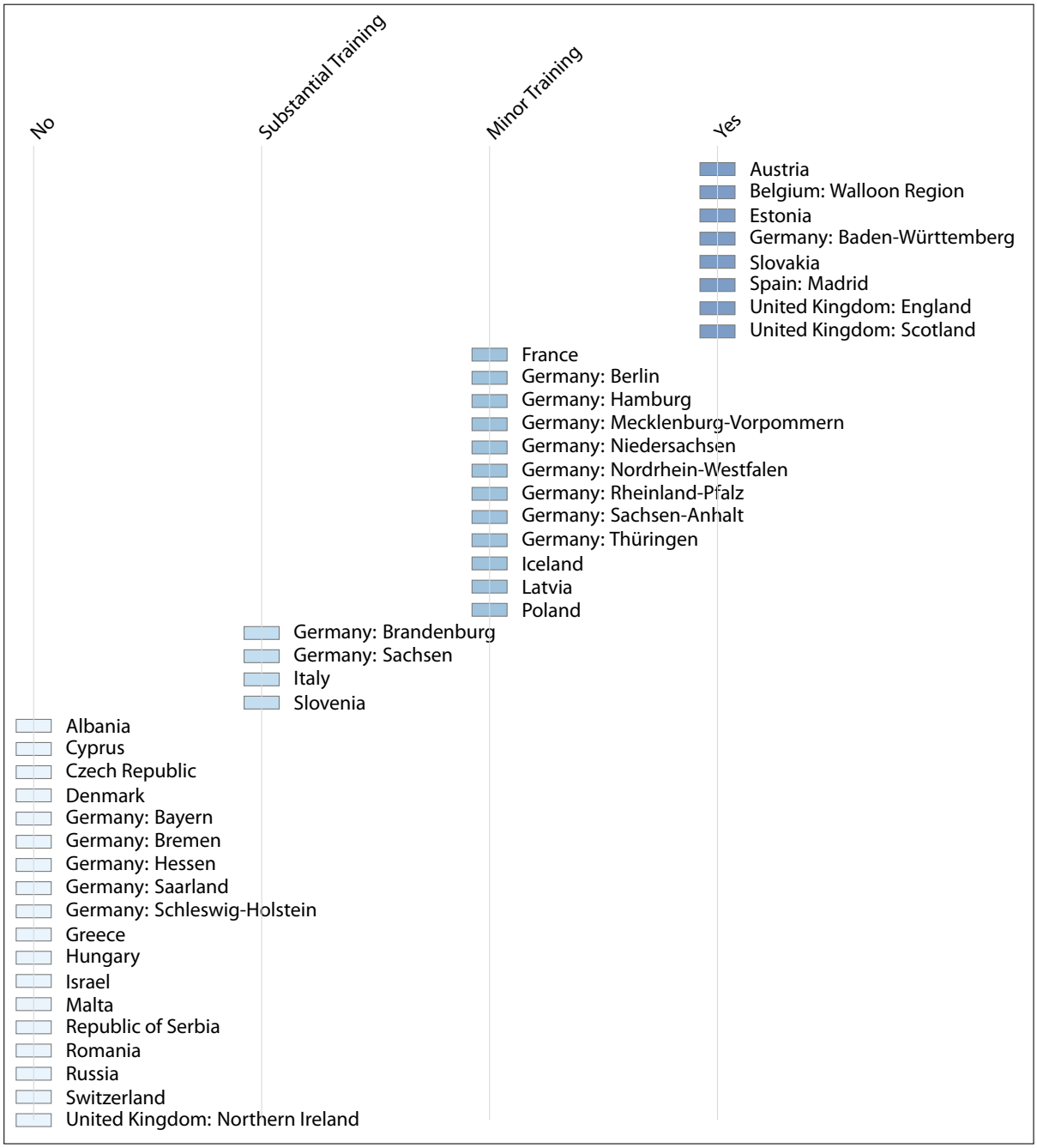
**Is it possible to teach Informatics if you are a Business teacher?**

To be able to offer Informatics classes even in the absence of fully trained Informatics teachers, schools may chose to (re-)train in-service teachers as part of continued professional development to teach Informatics classes. This map shows whether this option is available to Business teachers and - if so - which amount of additional training in Informatics is required. For countries with different types of secondary schools, data is given for schools leading to university entrance qualification.




| | |
|---|---|
| **No:** | Teaching is not possible without a full training as an Informatics teacher. |
| **Substantial Training:** | Teaching is possible after having completed a substantial re-training. |
| **Minor Training:** | Teaching is possible after having completed a minor re-training. |
| **Yes:** | Teaching is possible without any extra requirements. |

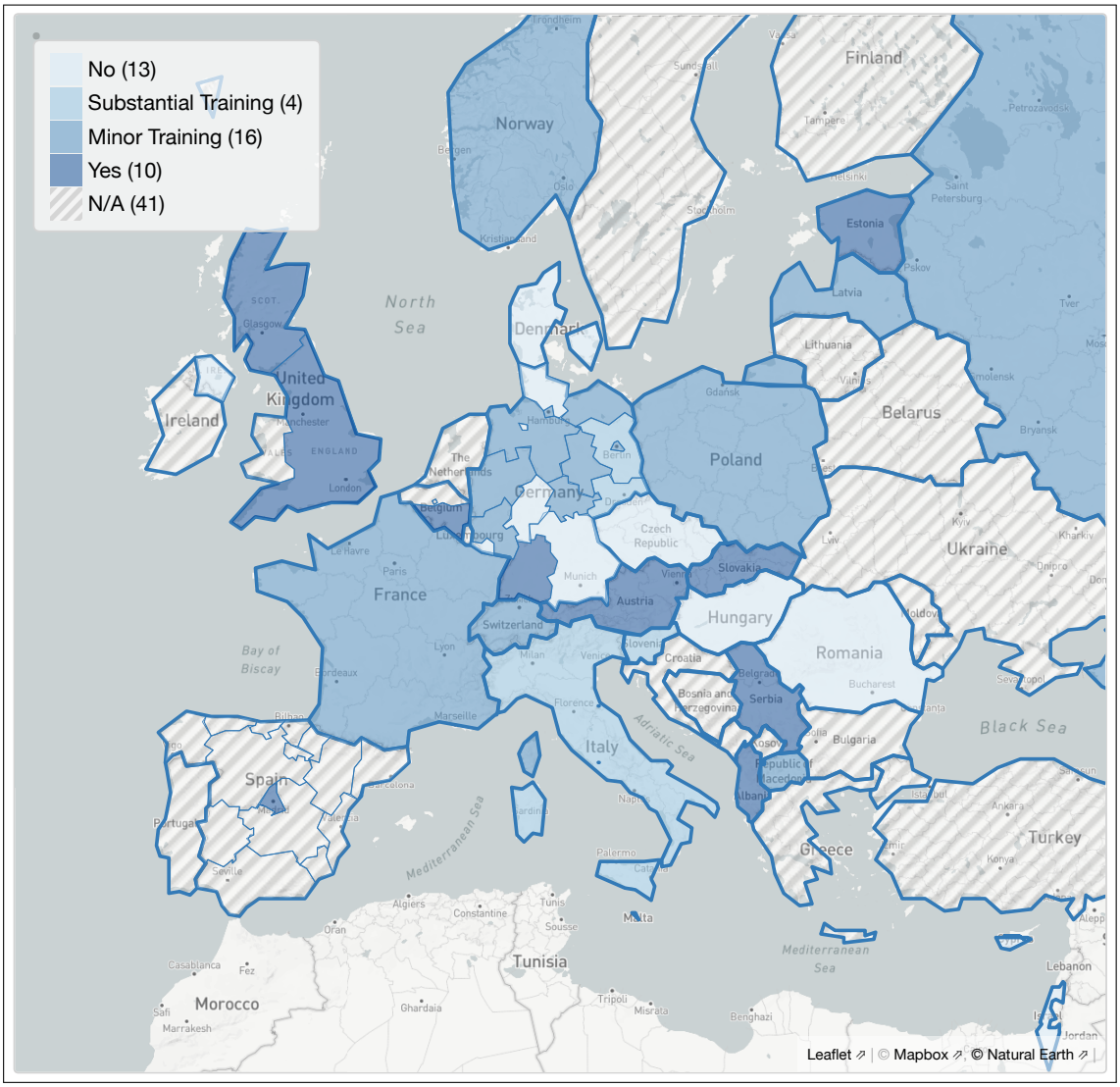
**Is it possible to teach Informatics if you are a Business teacher?**



# Teacher Training: Engineering Teachers

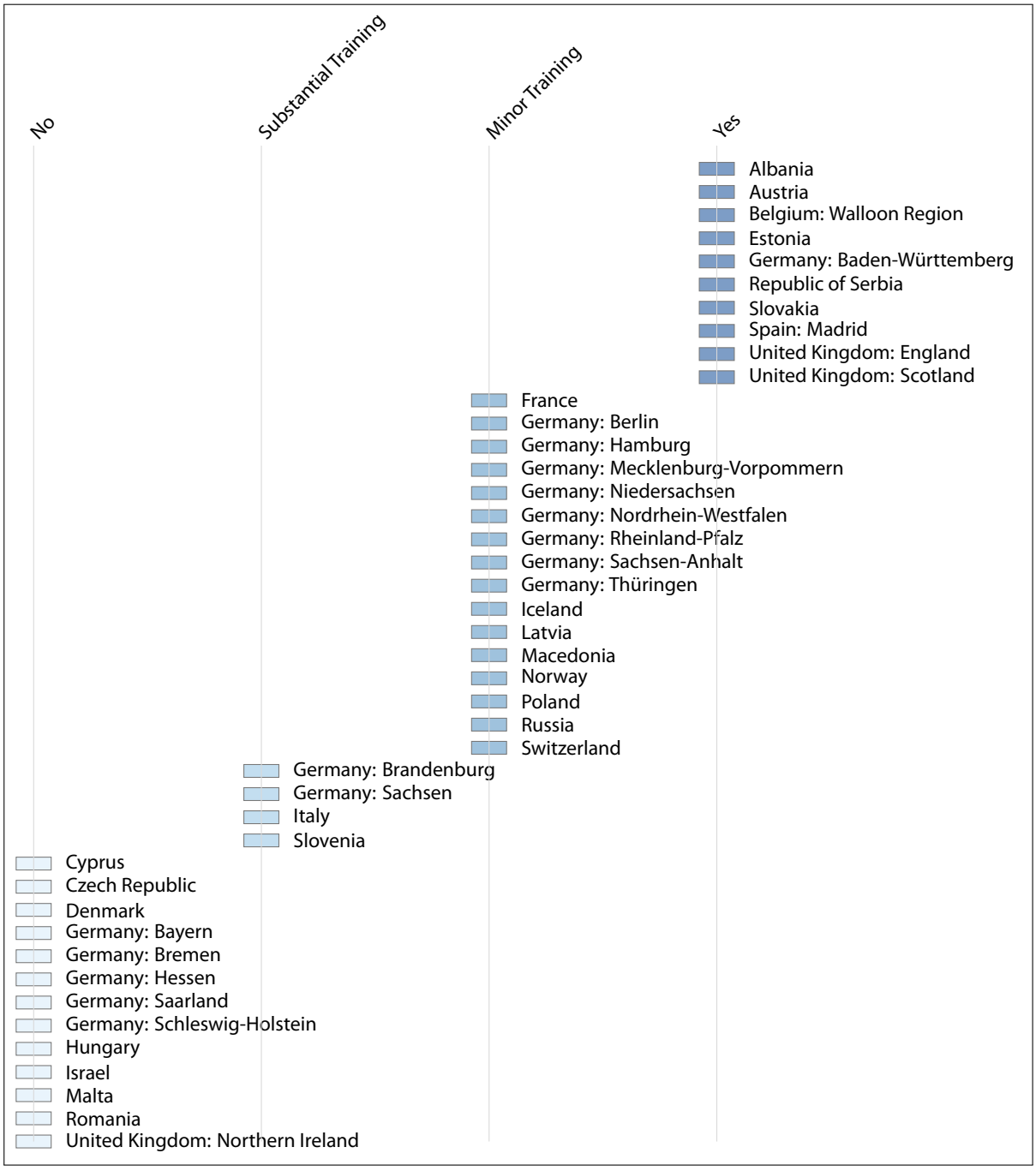
**Is it possible to teach Informatics if you are a Engineering teacher?**

To be able to offer Informatics classes even in the absence of fully trained Informatics teachers, schools may chose to (re-)train in-service teachers as part of continued professional development to teach Informatics classes. This map shows whether this option is available to Engineering teachers and - if so - which amount of additional training in Informatics is required. For countries with different types of secondary schools, data is given for schools leading to university entrance qualification.




| | |
|---|---|
| **No:** | Teaching is not possible without a full training as an Informatics teacher. |
| **Substantial Training:** | Teaching is possible after having completed a substantial re-training. |
| **Minor Training:** | Teaching is possible after having completed a minor re-training. |
| **Yes:** | Teaching is possible without any extra requirements. |

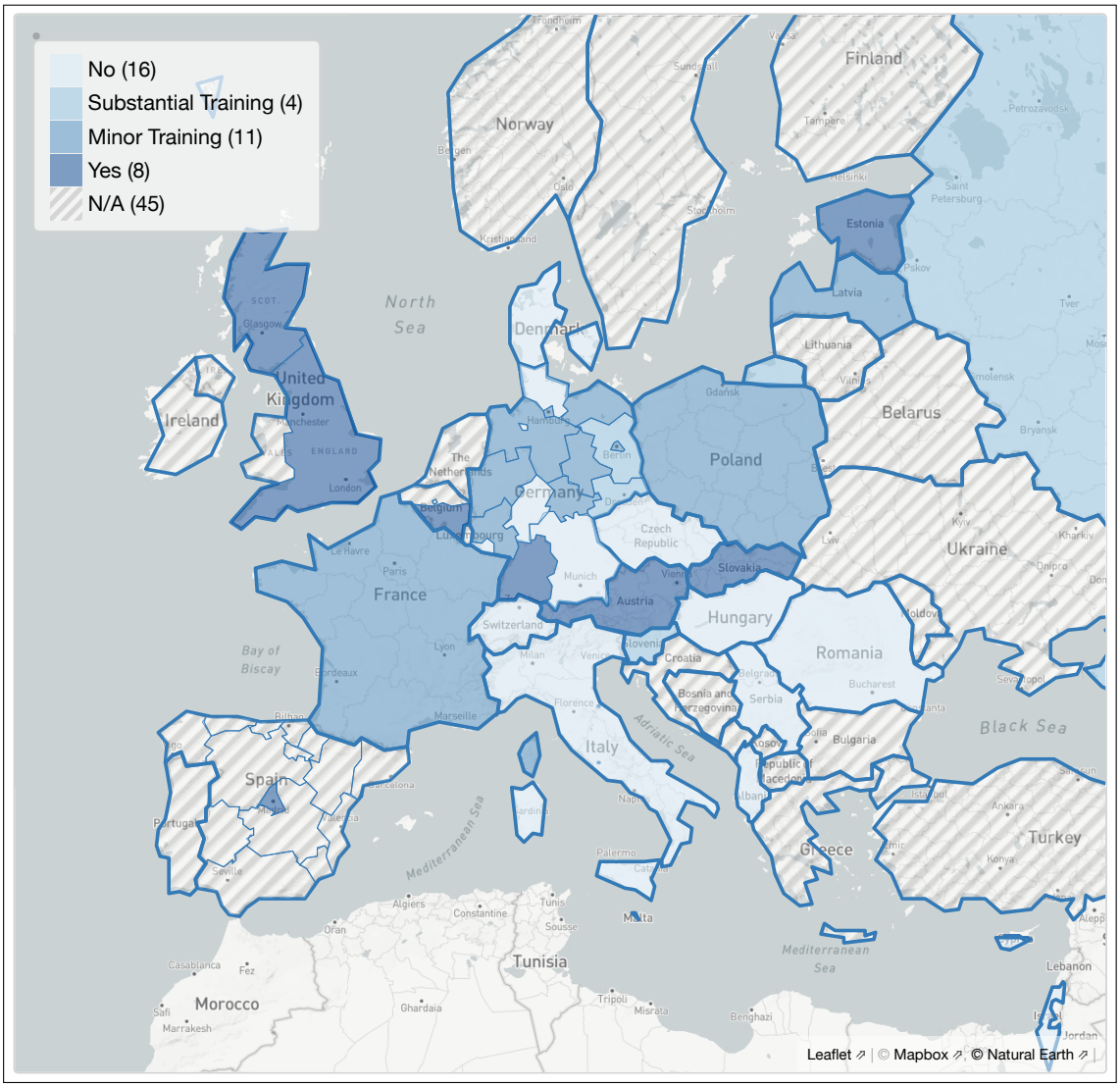
**Is it possible to teach Informatics if you are a Engineering teacher?**



# Teacher Training: Teachers from other Disciplines

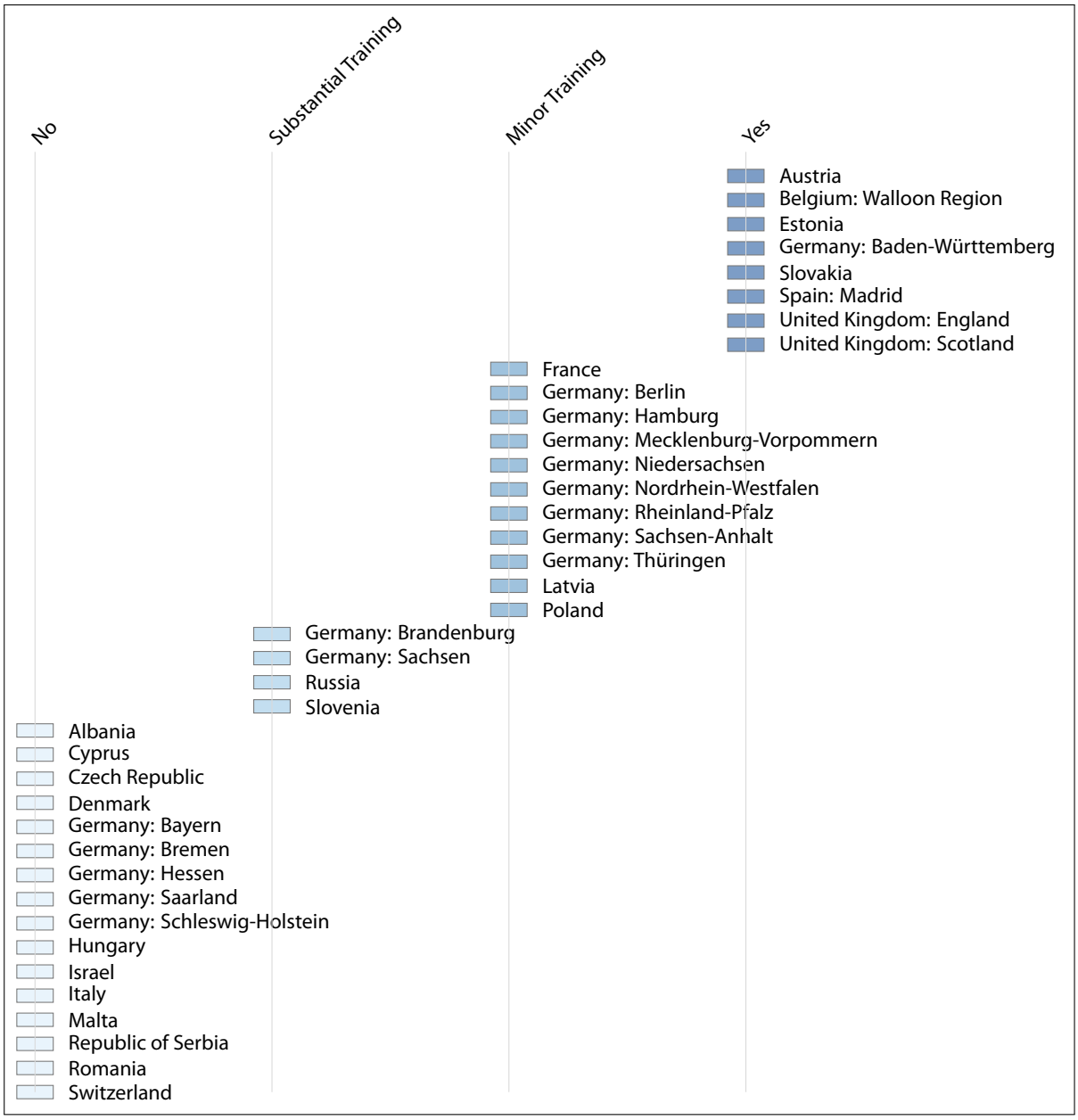
**Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering?**

To be able to offer Informatics classes even in the absence of fully trained Informatics teachers, schools may chose to (re-)train in-service teachers as part of continued professional development to teach Informatics classes. This map shows whether this option is available to teachers in disciplines other than Mathematics, Physics, Business, or Engineering and - if so - what amount of additional training in Informatics is required. For countries with different types of secondary schools, data is given for schools leading to university entrance qualification.




| | |
|---|---|
| **No:** | Teaching is not possible without a full training as an Informatics teacher. |
| **Substantial Training:** | Teaching is possible after having completed a substantial re-training. |
| **Minor Training:** | Teaching is possible after having completed a minor re-training. |
| **Yes:** | Teaching is possible without any extra requirements. |

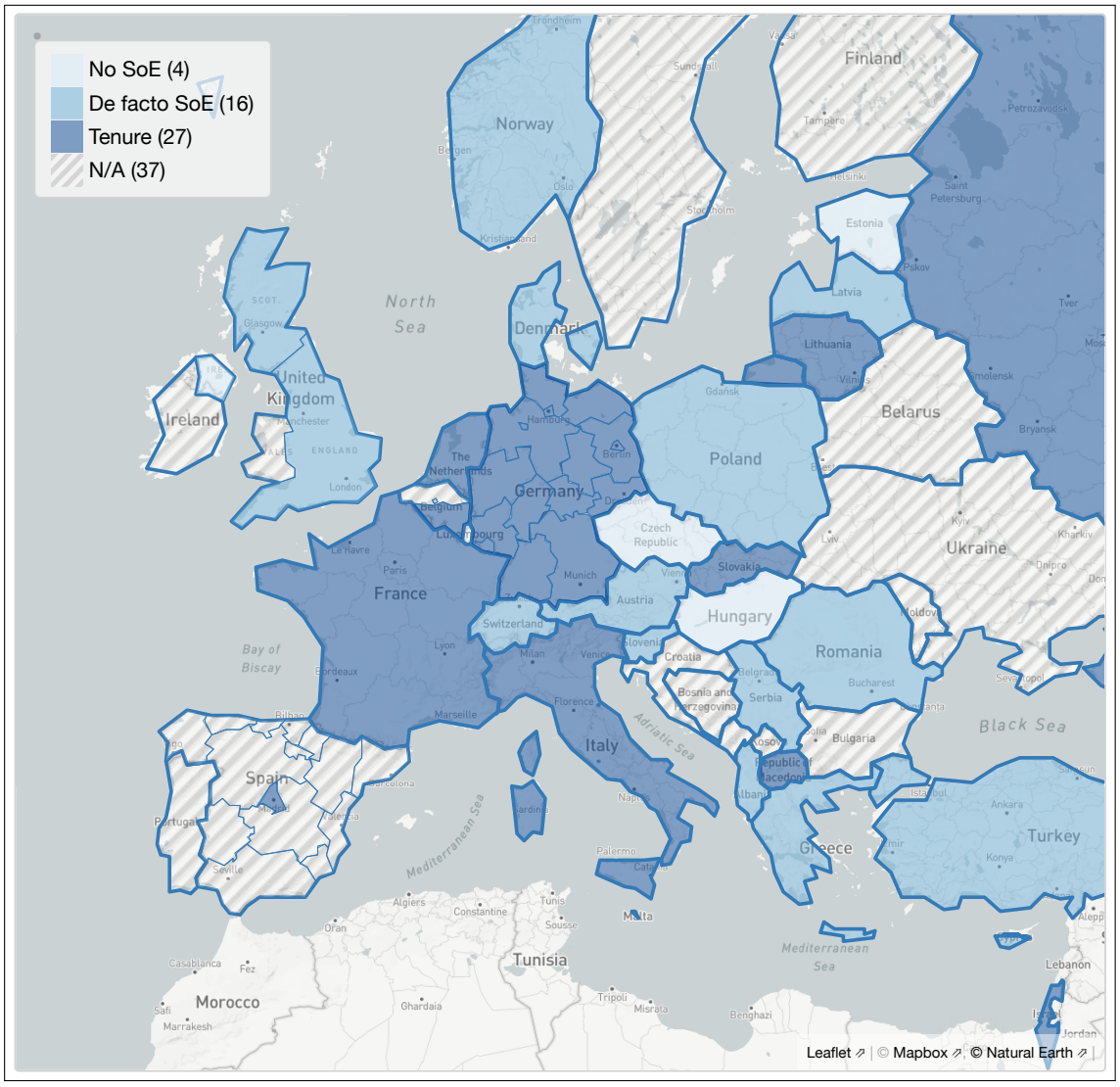
**Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering?**



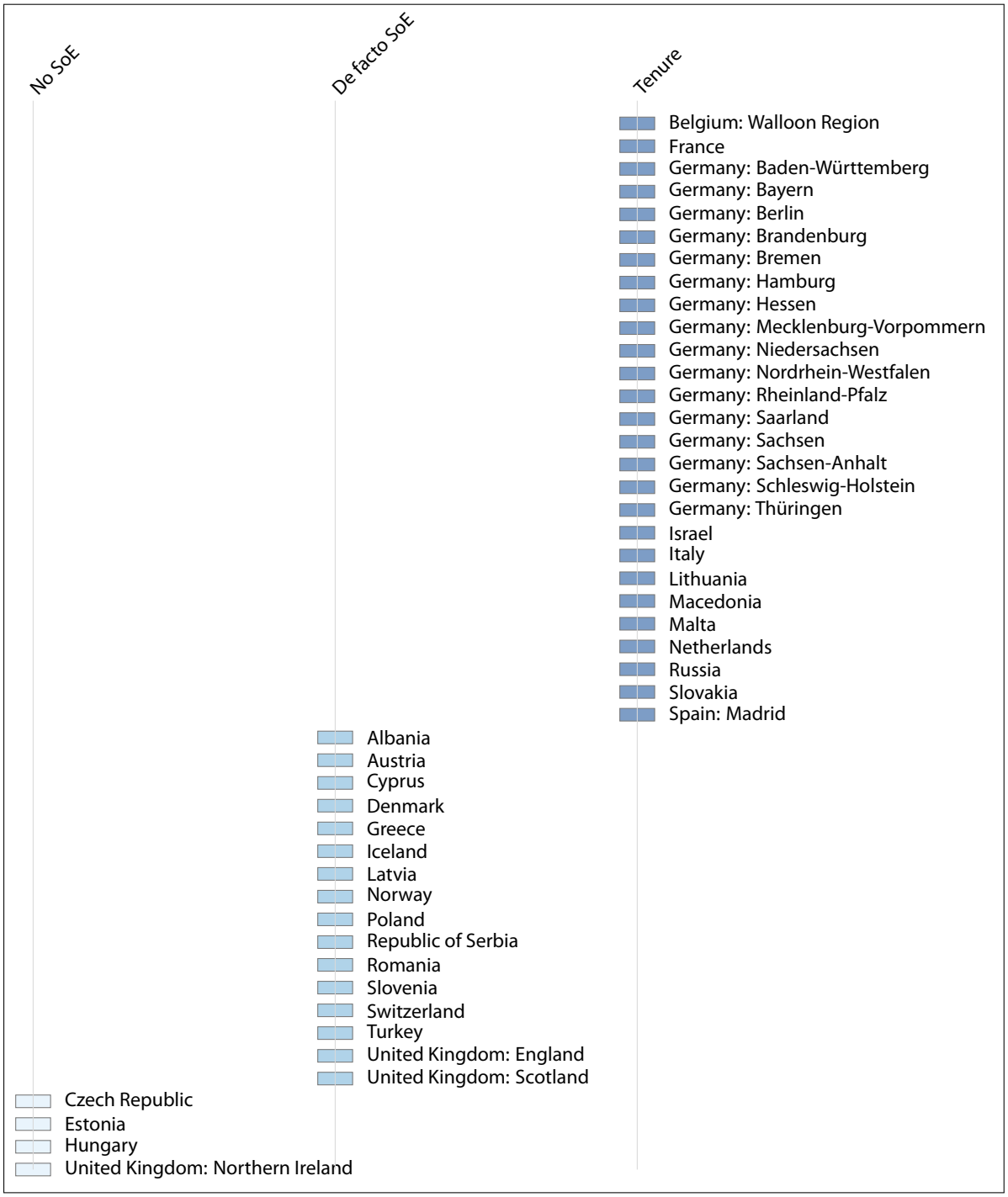
# Teacher Training: Security of Employment

**What is the security of employment for teachers?**

This map shows the level of security of employment in the teaching profession.

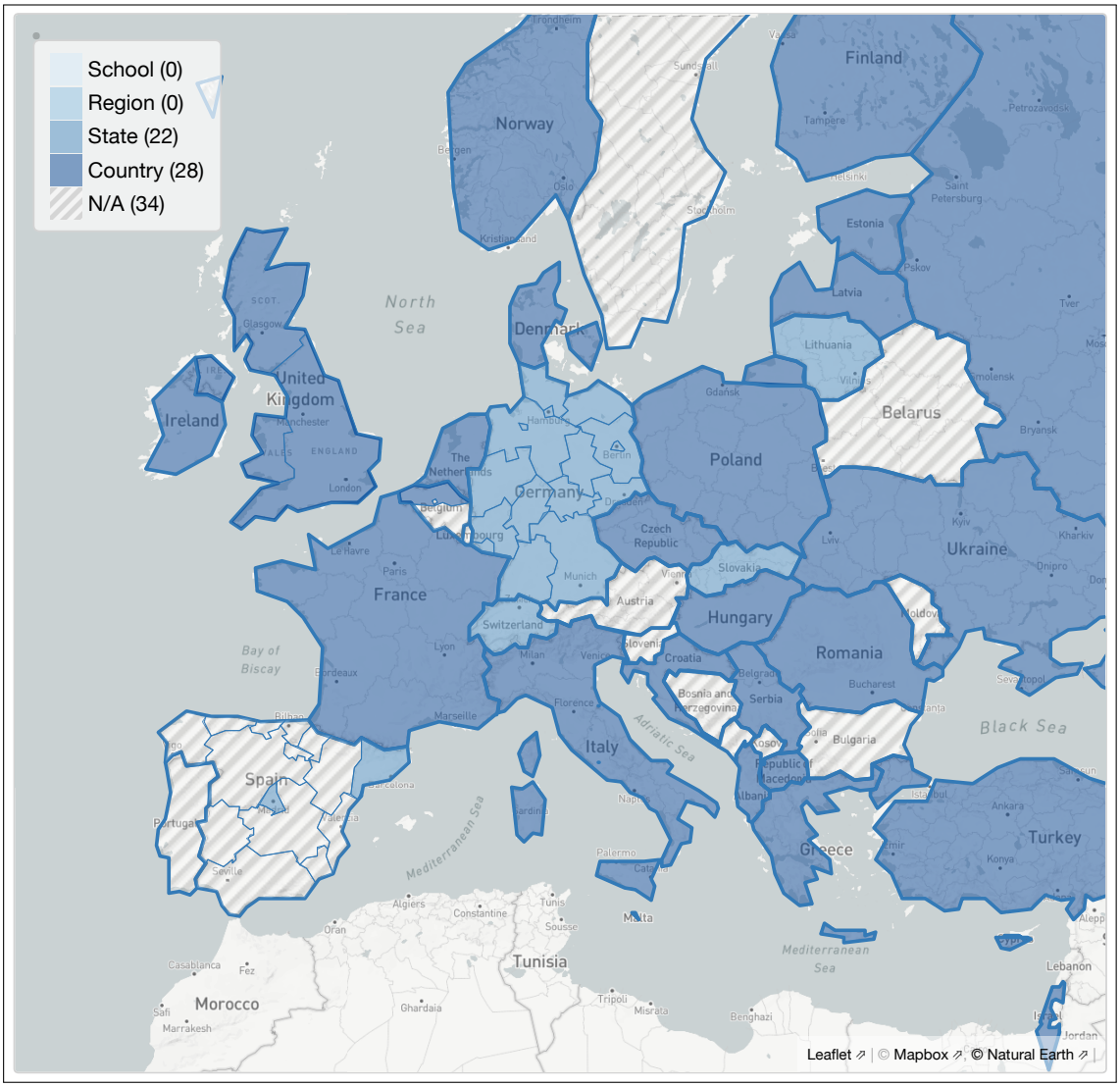


**What is the security of employment for teachers?**



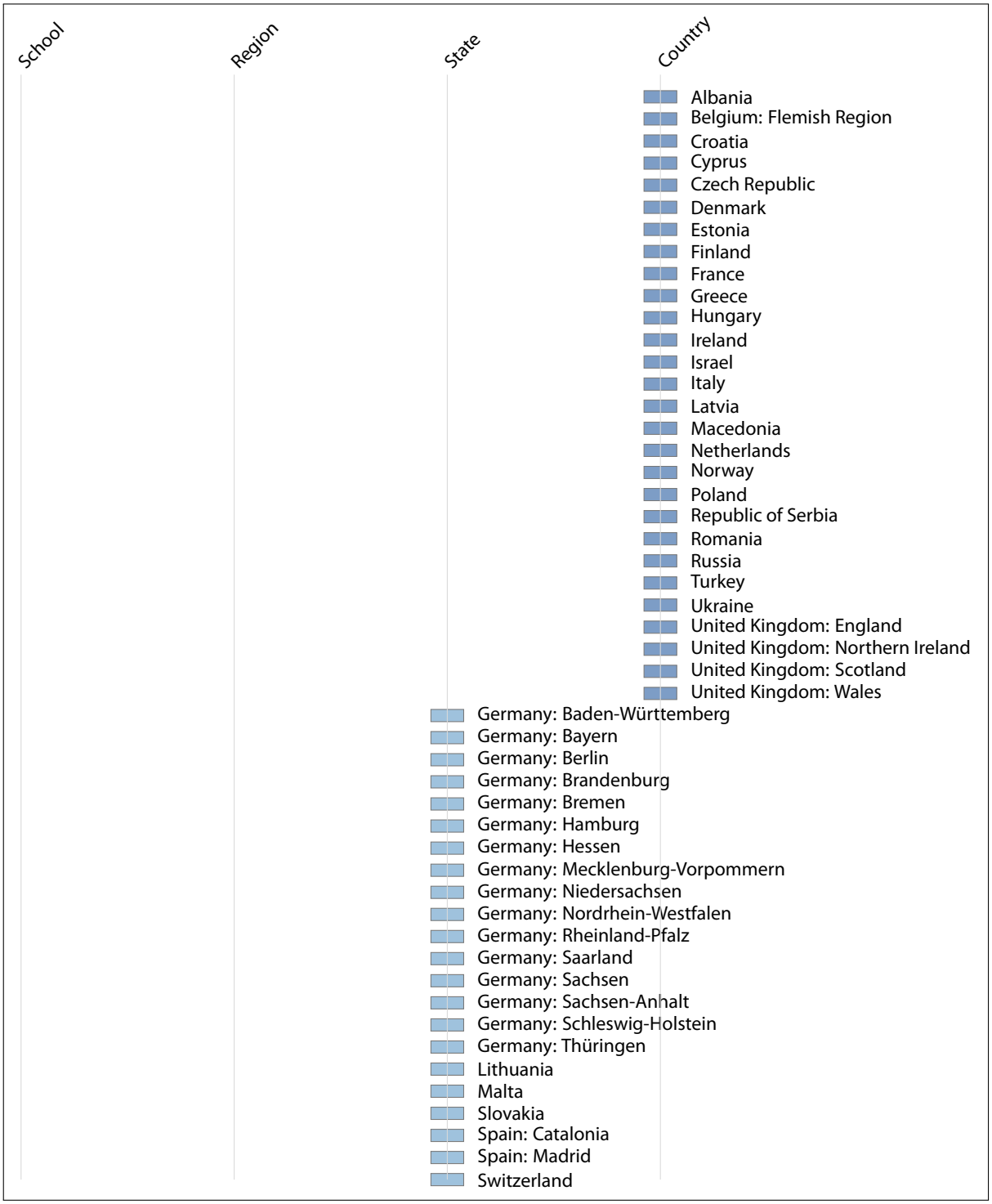
**At which administrative level are educational policy decisions being made?**

To effectively promote the case of Informatics and Digital Literacy, understanding at which adminstrative levels decisions regarding educational policies are being made is of central importance. The map uses the scale of the "range of influence" dimension of the Darmstadt model to classify the level at which decisions regarding educational policies are being made. The Darmstadt model is a recent category system for concepts, experiences, and research outcomes in Informatics education at primary and secondary level [see e.g. P. Hubwieser: The Darmstadt Model: A First Step towards a Research Framework for Computer Science Education in Schools, Proceedings of the 6th International Conference on Informatics in Schools: Situation, Evolution, and Perspectives (ISSEP 2013), Lecture Notes in Computer Science, vol. 7780, pp. 1-14; DOI].




For the purposes of this mode description, England, Northern Ireland, Scotland and Wales are regarded as four distinct countries.

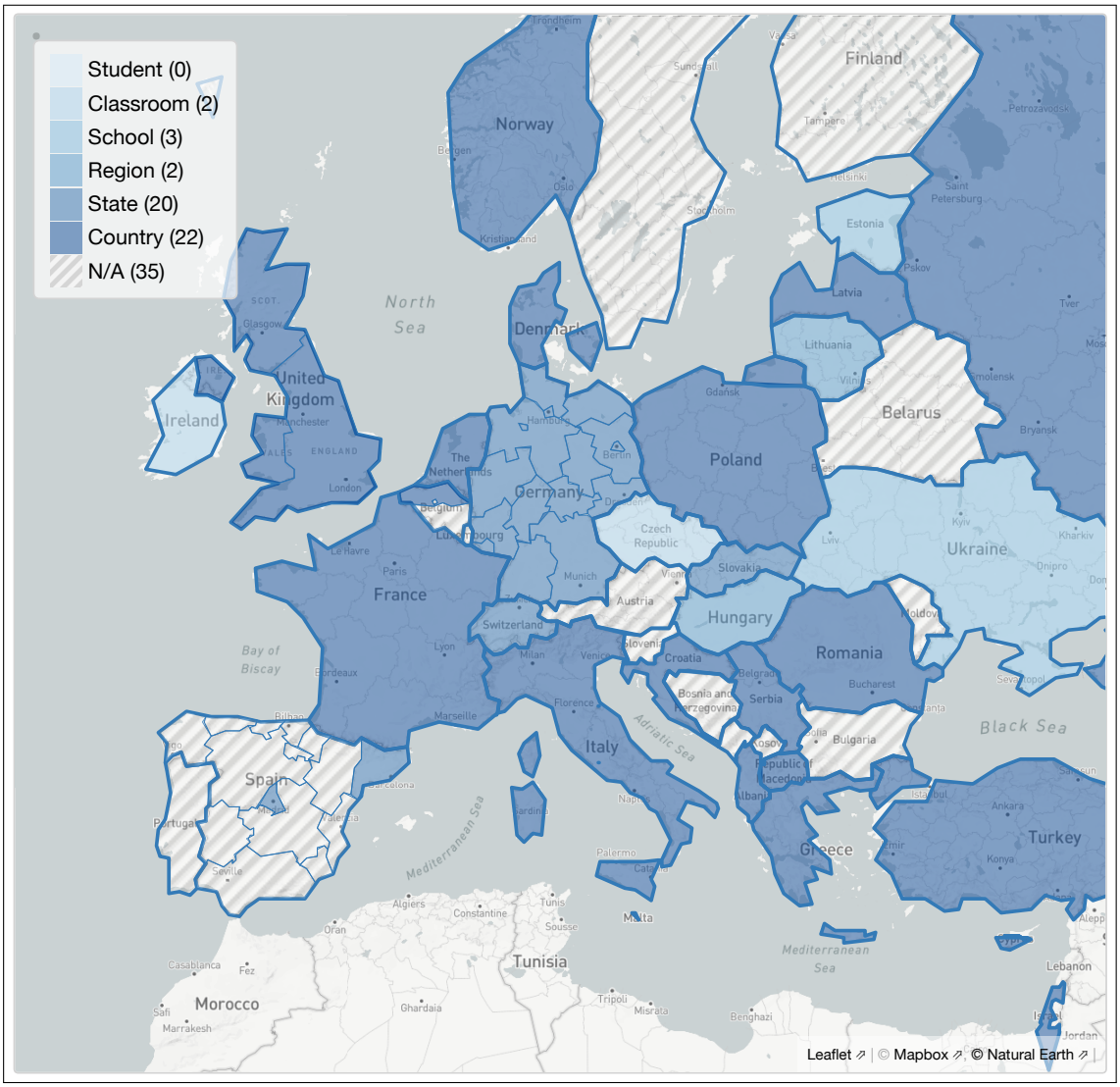
**At which administrative level are educational policy decisions being made?**



# Learning Objectives

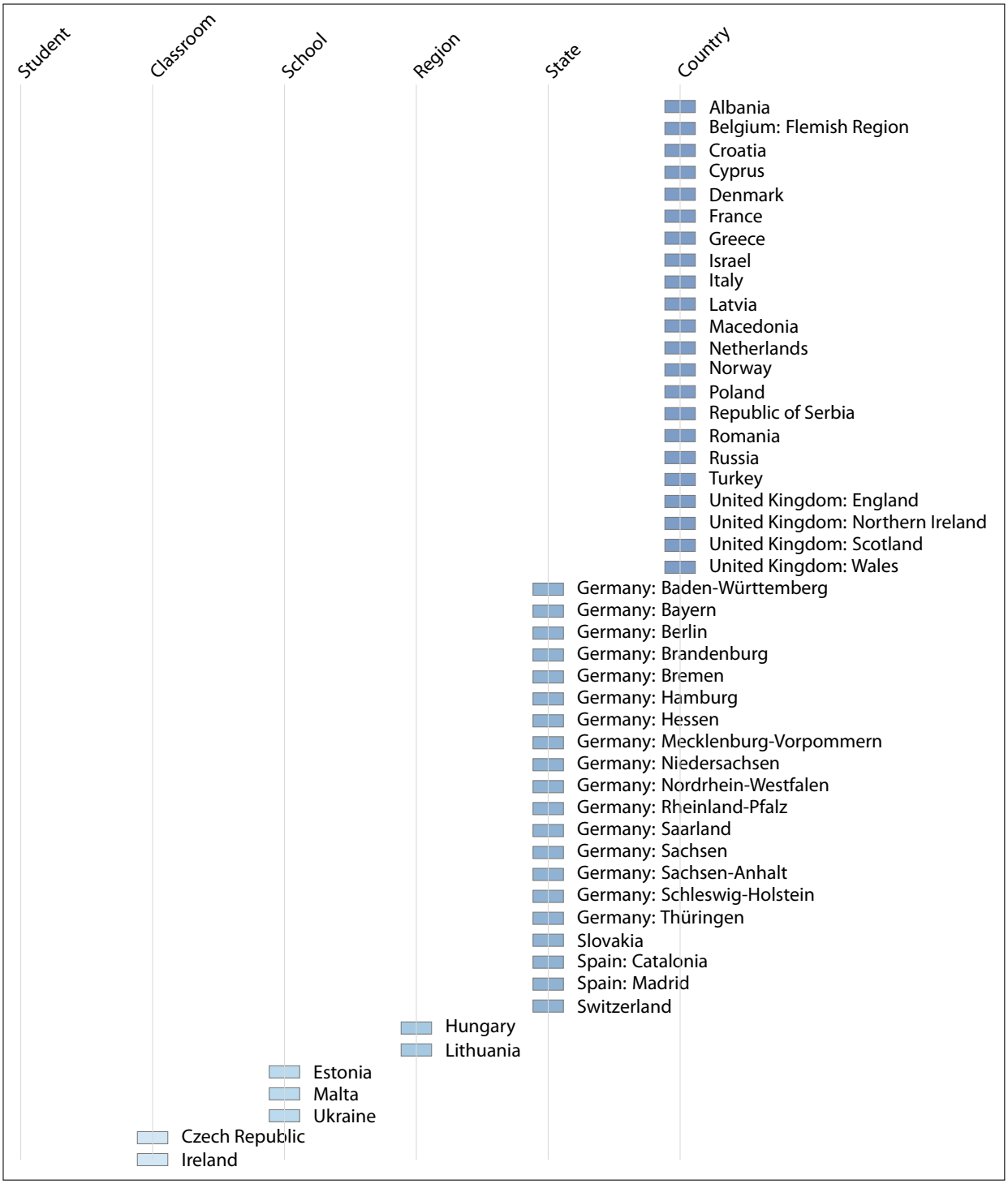
**At which level are learning objectives being defined?**

When discussing curricula and implementation issues, understanding at which administrative levels decisions regarding learning objectives are being made is of central importance. The map uses the scale of the "range of influence" dimension of the Darmstadt model to classify the level at which decisions regarding learning objectives are being made. The Darmstadt model is a recent category system for concepts, experiences, and research outcomes in Informatics education at primary and secondary level [see e.g. P. Hubwieser: The Darmstadt Model: A First Step towards a Research Framework for Computer Science Education in Schools, Proceedings of the 6th International Conference on Informatics in Schools: Situation, Evolution, and Perspectives (ISSEP 2013), Lecture Notes in Computer Science, vol. 7780, pp. 1-14; DOI].




For the purposes of this mode description, England, Northern Ireland, Scotland and Wales are regarded as four distinct countries.

**At which level are learning objectives being defined?**



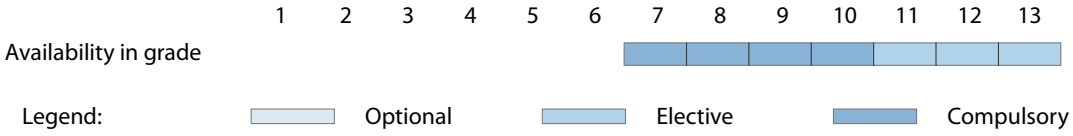
# D. Country Fact Sheets

Clicking on the name of a data mode, i.e. on a subheading, in the overview page will open that data mode's overview page.

# Albania

The term used for Digital Literacy is T.I.K. (this corresponds to the English term I.C.T.). The name used for Informatics in Albania is Informatike.

| | |
|---|---|
| **Data Availability** | |
| What is the data availability status? | Data available |
| **Informatics: First Contact** | |
| What is the first year pupils are able to attend informatics courses? | Higher Secondary |
| **Informatics: Availability of Courses** | |
| Are Informatics courses offered in secondary schools leading to possible university entrance? | Yes |
| **Informatics: Availability of Courses By Grade** | |
| What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? | (see chart below) |




| | |
|---|---|
| **Informatics: Curriculum Consistency** | |
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | Country |
| **Digital Literacy: First Contact** | |
| In which year do pupils have their first contact with computers or the internet in schools? | Lower Secondary |
| **Digital Literacy: A Separate Subject?** | |
| Is digital literacy a separate subject or is it integrated in other subjects? | Separate subject |
| **Digital Literacy: Curriculum Consistency** | |
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | Country |
| **Digital Literacy: Enrolment** | |
| What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? | all students |
| **Teacher Training: Special Qualifications** | |
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | None |
| **Teacher Training: Number of Subjects** | |
| In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? | 2 |
| **Teacher Training: Entry Requirement** | |
| What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? | M.Ed. / M.Sc. + pgc. |
| **Teacher Training: In-Service Length** | |
| How long is the in-service part of teacher training across all subjects? | 7-12 months |
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | Yes |

| | |
|---|---|
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | (Yes) |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Yes |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Yes |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | No |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | Yes |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | No |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | De facto SoE |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | Country |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | Country |

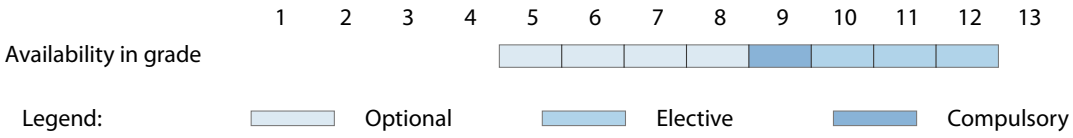
# Andorra

| Data Availability | |
|---|---|
| What is the data availability status? | No data |

# Austria

In Austria, digital literacy can be translated with Informationstechnologische Grundbildung and recently there is an upcoming initiative called digital competenc(i)es. Informatics is referred to as Informatik.

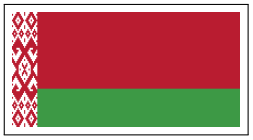
| | |
|---|---|
| **Data Availability** | |
| What is the data availability status? | Data available |
| **Informatics: First Contact** | |
| What is the first year pupils are able to attend informatics courses? | Lower Secondary |
| **Informatics: Availability of Courses** | |
| Are Informatics courses offered in secondary schools leading to possible university entrance? | Yes |
| **Informatics: Availability of Courses By Grade** | |
| What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? | (see chart below) |




| | |
|---|---|
| **Informatics: Curriculum Consistency** | |
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | Country |
| **Informatics: Enrolment** | |
| What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? | 10-24% |
| **Digital Literacy: First Contact** | |
| In which year do pupils have their first contact with computers or the internet in schools? | Primary |
| **Digital Literacy: A Separate Subject?** | |
| Is digital literacy a separate subject or is it integrated in other subjects? | Integrated |
| **Digital Literacy: Curriculum Consistency** | |
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | School |
| **Teacher Training: Special Qualifications** | |
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | Special qualifications |
| **Teacher Training: Number of Subjects** | |
| In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? | 2 |
| **Teacher Training: Entry Requirement** | |
| What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? | B.Ed. / B.Sc. + pgc. |
| **Teacher Training: In-Service Length** | |
| How long is the in-service part of teacher training across all subjects? | 7-12 months |
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | No |

| | |
|---|---|
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | Yes |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Yes |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Yes |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | Yes |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | Yes |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | Yes |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | De facto SoE |

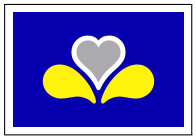
# Belarus



| Data Availability | |
|---|---|
| What is the data availability status? | No data |

# Belgium: Brussels-Capital Region

In Belgium Digital Literacy is refered to as digitale geletterdheid, ICT or (Toegepaste) Informatica. Informatics is refered to as Informatica or, more recently, Informaticawetenschappen/Computerwetenschappen.



| **Data Availability** | |
|---|---|
| What is the data availability status? | No data |

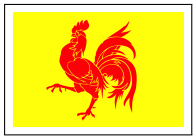
# Belgium: Flemish Region

In Belgium Digital Literacy is refered to as digitale geletterdheid, ICT or (Toegepaste) Informatica. Informatics is refered to as Informatica or, more recently, Informaticawetenschappen/Computerwetenschappen.

| | |
|---|---|
| **Data Availability** | |
| What is the data availability status? | Data available |
| **Informatics: First Contact** | |
| What is the first year pupils are able to attend informatics courses? | Higher Secondary |
| **Informatics: Availability of Courses** | |
| Are Informatics courses offered in secondary schools leading to possible university entrance? | Yes, but not for all |
| **Informatics: Availability of Courses By Grade** | |
| What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? | No data |
| **Informatics: Curriculum Consistency** | |
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | School |
| **Digital Literacy: First Contact** | |
| In which year do pupils have their first contact with computers or the internet in schools? | Kindergarten |
| **Digital Literacy: A Separate Subject?** | |
| Is digital literacy a separate subject or is it integrated in other subjects? | Separate subject |
| **Digital Literacy: Curriculum Consistency** | |
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | Country |
| **Teacher Training: Special Qualifications** | |
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | Special qualifications |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | Country |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | Country |

# Belgium: Walloon Region

In Belgium Digital Literacy is refered to as digitale geletterdheid, ICT or (Toegepaste) Informatica. Informatics is refered to as Informatica or, more recently, Informaticawetenschappen/Computerwetenschappen.



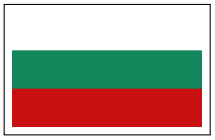
| | |
|---|---|
| **Data Availability** | |
| What is the data availability status? | Data available |
| **Informatics: Availability of Courses** | |
| Are Informatics courses offered in secondary schools leading to possible university entrance? | No |
| **Informatics: Availability of Courses By Grade** | |
| What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? | No data |
| **Teacher Training: Number of Subjects** | |
| In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? | 1 |
| **Teacher Training: Entry Requirement** | |
| What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? | M.Sc. |
| **Teacher Training: In-Service Length** | |
| How long is the in-service part of teacher training across all subjects? | 1-6 months |
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | No |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | No |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | No |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | (Yes) |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | Yes |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Yes |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Yes |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | Yes |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | Yes |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | Yes |

| Teacher Training: Security of Employment | |
|---|---|
| What is the security of employment for teachers? | Tenure |

# Bosnia and Herzegowina

| Data Availability | |
|---|---|
| What is the data availability status? | No data |

# Bulgaria



| Data Availability | |
|---|---|
| What is the data availability status? | No data |

# Croatia

The term used for Digital Literacy in Croatia is Informaticka pismenost. Informatics is refered to as informatika in high school or racunalstvo (Computer Science) in technical schools.

| | |
|---|---|
| **Data Availability** | |
| What is the data availability status? | Data available |
| **Informatics: First Contact** | |
| What is the first year pupils are able to attend informatics courses? | Primary |
| **Informatics: Curriculum Consistency** | |
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | Country |
| **Digital Literacy: First Contact** | |
| In which year do pupils have their first contact with computers or the internet in schools? | Primary |
| **Digital Literacy: A Separate Subject?** | |
| Is digital literacy a separate subject or is it integrated in other subjects? | Integrated |
| **Digital Literacy: Curriculum Consistency** | |
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | Country |
| **Digital Literacy: Enrolment** | |
| What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? | all students |
| **Teacher Training: Special Qualifications** | |
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | Special qualifications |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | Country |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | Country |

# Cyprus

The term for Computer Science in Cyprus is Πληροφορικη Επιστημη Ηλεκτρονικων Υπολογιστων.

**Data Availability**

What is the data availability status? — Data available

**Informatics: First Contact**

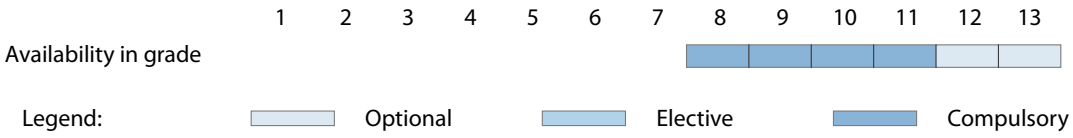
What is the first year pupils are able to attend informatics courses? — Lower Secondary

**Informatics: Availability of Courses**

Are Informatics courses offered in secondary schools leading to possible university entrance? — Combined

**Informatics: Availability of Courses By Grade**

What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? — (see chart below)




**Informatics: Curriculum Consistency**

Is the informatics curriculum in your country consistent across all schools or are there local differences? — Country

**Digital Literacy: First Contact**

In which year do pupils have their first contact with computers or the internet in schools? — Lower Secondary

**Digital Literacy: A Separate Subject?**

Is digital literacy a separate subject or is it integrated in other subjects? — Separate subject

**Digital Literacy: Curriculum Consistency**

Is the digital literacy curriculum in your country consistent across all schools or are there local differences? — Country

**Digital Literacy: Enrolment**

What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? — less than 10%

**Teacher Training: Special Qualifications**

Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? — Special qualifications

**Teacher Training: Number of Subjects**

In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? — 1

**Teacher Training: Entry Requirement**

What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? — B.Ed. / B.Sc. + pgc.

**Teacher Training: In-Service Length**

How long is the in-service part of teacher training across all subjects? — 7-12 months

**Teacher Training: Stand-alone Digital Literacy Curriculum**

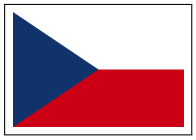
Is there a stand-alone curriculum in teacher training? (Digital Literacy) — Yes

| | |
|---|---|
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | No |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | No |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | No |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | No |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | No |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | No |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | De facto SoE |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | Country |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | Country |

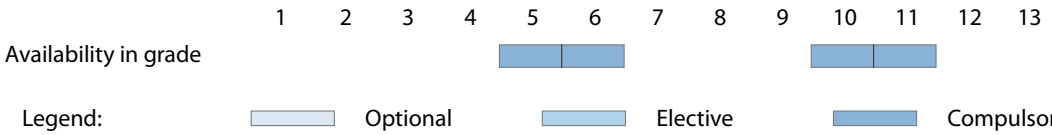
| Data Availability | |
|---|---|
| What is the data availability status? | No data |

# Czech Republic

In the Czech Republic, Digital Literacy is refered to as informační gramotnost, digitální gramotnost or ICT gramotnost. The term for Informatics is Informatika. (Sometimes some teachers and parents call the school subject výpočetní technika, počítače.)



| | |
|---|---|
| **Data Availability** | |
| What is the data availability status? | Data available |
| **Informatics: Availability of Courses** | |
| Are Informatics courses offered in secondary schools leading to possible university entrance? | Yes, compulsory I |
| **Informatics: Availability of Courses By Grade** | |
| What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? | (see chart below) |

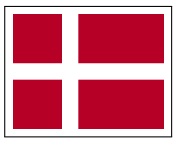



| | |
|---|---|
| **Informatics: Curriculum Consistency** | |
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | Country |
| **Digital Literacy: First Contact** | |
| In which year do pupils have their first contact with computers or the internet in schools? | Lower Secondary |
| **Digital Literacy: A Separate Subject?** | |
| Is digital literacy a separate subject or is it integrated in other subjects? | Separate subject |
| **Digital Literacy: Curriculum Consistency** | |
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | Country |
| **Digital Literacy: Enrolment** | |
| What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? | all students |
| **Teacher Training: Special Qualifications** | |
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | Special qualifications |
| **Teacher Training: Number of Subjects** | |
| In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? | 2 |
| **Teacher Training: Entry Requirement** | |
| What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? | M.Sc. |
| **Teacher Training: In-Service Length** | |
| How long is the in-service part of teacher training across all subjects? | 1-6 months |
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | Yes |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |

| | |
|---|---|
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | No |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | No |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | No |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | No |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | No |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | No |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | No SoE |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | Country |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | Classroom |

# Denmark

The term used for Digital Literacy in Denmark is Digital dannelse. Informatics is refered to as Informatik.



**Data Availability**

What is the data availability status? — Data available

**Informatics: First Contact**

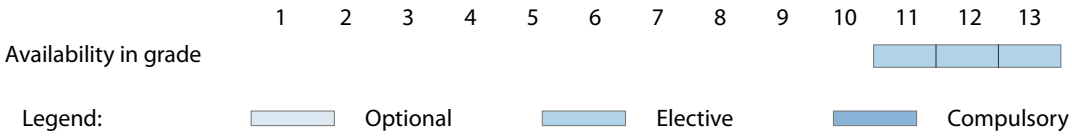
What is the first year pupils are able to attend informatics courses? — Higher Secondary

**Informatics: Availability of Courses**

Are Informatics courses offered in secondary schools leading to possible university entrance? — Yes

**Informatics: Availability of Courses By Grade**

What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? — (see chart below)




**Informatics: Curriculum Consistency**

Is the informatics curriculum in your country consistent across all schools or are there local differences? — Country

**Informatics: Enrolment**

What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? — less than 10%

**Digital Literacy: First Contact**

In which year do pupils have their first contact with computers or the internet in schools? — Primary

**Digital Literacy: A Separate Subject?**

Is digital literacy a separate subject or is it integrated in other subjects? — Integrated

**Digital Literacy: Curriculum Consistency**

Is the digital literacy curriculum in your country consistent across all schools or are there local differences? — Country

**Teacher Training: Special Qualifications**

Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? — Special qualifications

**Teacher Training: Number of Subjects**

In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? — 1.5

**Teacher Training: Entry Requirement**

What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? — M.Ed. / M.Sc. + pgc.

**Teacher Training: In-Service Length**

How long is the in-service part of teacher training across all subjects? — 7-12 months

**Teacher Training: Stand-alone Digital Literacy Curriculum**

Is there a stand-alone curriculum in teacher training? (Digital Literacy) — No

| | |
|---|---|
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | (Yes) |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Substantial Training |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | No |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | No |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | No |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | No |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | De facto SoE |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | Country |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | Country |

# Estonia

In Estonian schools, there exist different competing labels for Digital Literacy with slightly different meanings: Digitaalne Kirjaoskus (Digital Literacy), Infokirjaoskus (Information Literacy) and Meediakirjaoskus (Media Literacy). Informatics is refered to as Informaatika (Informatics) and Arvutiopetus (Computer Studies).

**Data Availability**

What is the data availability status? — Data available

**Informatics: First Contact**

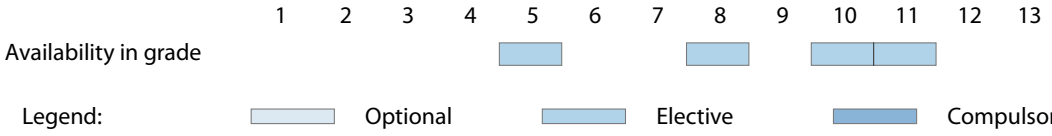
What is the first year pupils are able to attend informatics courses? — Lower Secondary

**Informatics: Availability of Courses**

Are Informatics courses offered in secondary schools leading to possible university entrance? — Yes, but not for all

**Informatics: Availability of Courses By Grade**

What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? — (see chart below)




**Informatics: Curriculum Consistency**

Is the informatics curriculum in your country consistent across all schools or are there local differences? — School

**Digital Literacy: First Contact**

In which year do pupils have their first contact with computers or the internet in schools? — Primary

**Digital Literacy: A Separate Subject?**

Is digital literacy a separate subject or is it integrated in other subjects? — Integrated

**Digital Literacy: Curriculum Consistency**

Is the digital literacy curriculum in your country consistent across all schools or are there local differences? — School

**Teacher Training: Special Qualifications**

Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? — Special qualifications

**Teacher Training: Number of Subjects**

In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? — 1.5

**Teacher Training: Entry Requirement**

What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? — M.Ed. / M.Sc. + pgc.

**Teacher Training: In-Service Length**

How long is the in-service part of teacher training across all subjects? — 1-6 months

**Teacher Training: Stand-alone Digital Literacy Curriculum**

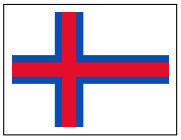
Is there a stand-alone curriculum in teacher training? (Digital Literacy) — No

**Teacher Training: Stand-alone Informatics Curriculum**

Is there a stand-alone curriculum in teacher training? (Informatics) — Yes

| | |
|---|---|
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | (Yes) |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Yes |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Yes |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | Yes |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | Yes |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | Yes |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | No SoE |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | Country |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | School |

# Faroe Islands



| Data Availability | |
|---|---|
| What is the data availability status? | No data |

# Finland

In Finland, Digital Literacy is refered to as Tietotekniikka, the term for Informatics is Tietojenkasittelytiede (Computer Science).

| | |
|---|---|
| **Data Availability** | |
| What is the data availability status? | Data available |
| **Informatics: First Contact** | |
| What is the first year pupils are able to attend informatics courses? | Higher Secondary |
| **Informatics: Availability of Courses** | |
| Are Informatics courses offered in secondary schools leading to possible university entrance? | No |
| **Informatics: Availability of Courses By Grade** | |
| What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? | (see chart below) |

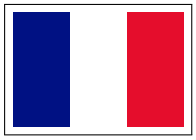
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Availability in grade | | | | | | | | | | | | | |

Legend: Optional Elective Compulsory

| | |
|---|---|
| **Informatics: Curriculum Consistency** | |
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | School |
| **Digital Literacy: First Contact** | |
| In which year do pupils have their first contact with computers or the internet in schools? | Primary |
| **Digital Literacy: A Separate Subject?** | |
| Is digital literacy a separate subject or is it integrated in other subjects? | Integrated |
| **Digital Literacy: Curriculum Consistency** | |
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | School |
| **Teacher Training: Special Qualifications** | |
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | Special qualifications |
| **Teacher Training: Entry Requirement** | |
| What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? | M.Ed. / M.Sc. + pgc. |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | Country |

# France

In France as a term for Digital Literacy Litteratie Numerique is starting to be used. More common are the terms TUICE or TICE ("Techniques [usuelles] d'information et de communication pour l'enseignement"). Informatics is refered to as Informatique, sometimes Science Informatique. When the subject was introduced in 2012 in the Lycee, the offcial name was Informatique et sciences du numerique.



**Data Availability**

What is the data availability status? — Data available

**Informatics: First Contact**

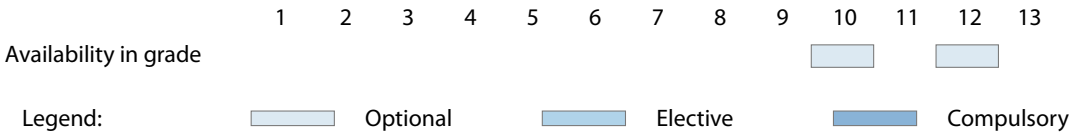
What is the first year pupils are able to attend informatics courses? — Higher Secondary

**Informatics: Availability of Courses**

Are Informatics courses offered in secondary schools leading to possible university entrance? — Yes, but not for all

**Informatics: Availability of Courses By Grade**

What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? — (see chart below)




**Informatics: Curriculum Consistency**

Is the informatics curriculum in your country consistent across all schools or are there local differences? — Country

**Informatics: Enrolment**

What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? — less than 10%

**Digital Literacy: First Contact**

In which year do pupils have their first contact with computers or the internet in schools? — Primary

**Digital Literacy: A Separate Subject?**

Is digital literacy a separate subject or is it integrated in other subjects? — Integrated

**Digital Literacy: Curriculum Consistency**

Is the digital literacy curriculum in your country consistent across all schools or are there local differences? — Country

**Teacher Training: Special Qualifications**

Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? — Special qualifications

**Teacher Training: Number of Subjects**

In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? — 1.5

**Teacher Training: Entry Requirement**

What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? — M.Ed. / M.Sc. + pgc.

**Teacher Training: In-Service Length**

How long is the in-service part of teacher training across all subjects? — 1-6 months

**Teacher Training: Stand-alone Digital Literacy Curriculum**

Is there a stand-alone curriculum in teacher training? (Digital Literacy) — No

| | |
|---|---|
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | No |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | No |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | No |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Minor Training |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Minor Training |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | Minor Training |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | Minor Training |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | Minor Training |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | Tenure |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | Country |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | Country |

# Germany: Baden-Württemberg

Germany is a federal republic consisting of sixteen federal states. All decisions regarding educational policies are made by the state ministries of education within the scope of federal regulations. Depending on which state, Digital Literacy is referred to as Informationstechnische Grundbildung, Informations- und kommunikationstechnische Grundbildung, or Medienkunde. Informatics is always referred to as Informatik.

**Data Availability**

What is the data availability status? — Data available

**Informatics: First Contact**

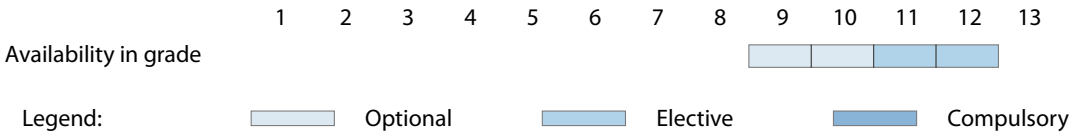
What is the first year pupils are able to attend informatics courses? — Higher Secondary

**Informatics: Availability of Courses**

Are Informatics courses offered in secondary schools leading to possible university entrance? — Yes

**Informatics: Availability of Courses By Grade**

What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? — (see chart below)




**Informatics: Curriculum Consistency**

Is the informatics curriculum in your country consistent across all schools or are there local differences? — State

**Informatics: Enrolment**

What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? — less than 10%

**Digital Literacy: First Contact**

In which year do pupils have their first contact with computers or the internet in schools? — Primary

**Digital Literacy: A Separate Subject?**

Is digital literacy a separate subject or is it integrated in other subjects? — Integrated

**Digital Literacy: Curriculum Consistency**

Is the digital literacy curriculum in your country consistent across all schools or are there local differences? — School

**Digital Literacy: Enrolment**

What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? — all students

**Teacher Training: Special Qualifications**

Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? — Special qualifications

**Teacher Training: Number of Subjects**

In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? — 2

**Teacher Training: Entry Requirement**

What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? — M.Ed. / M.Sc. + pgc.

**Teacher Training: In-Service Length**

How long is the in-service part of teacher training across all subjects? — 13-18 months

| | |
|---|---|
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | No |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | No |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Yes |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Yes |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | Yes |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | Yes |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | Yes |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | Tenure |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | State |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | State |

# Germany: Bayern

Germany is a federal republic consisting of sixteen federal states. All decisions regarding educational policies are made by the state ministries of education within the scope of federal regulations. Depending on which state, Digital Literacy is referred to as Informationstechnische Grundbildung, Informations- und kommunikationstechnische Grundbildung, or Medienkunde. Informatics is always referred to as Informatik.

**Data Availability**

What is the data availability status? — Data available

**Informatics: First Contact**

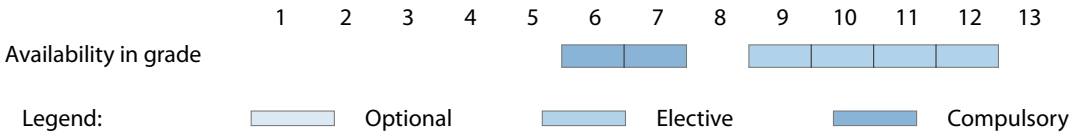
What is the first year pupils are able to attend informatics courses? — Lower Secondary

**Informatics: Availability of Courses**

Are Informatics courses offered in secondary schools leading to possible university entrance? — Yes, compulsory I

**Informatics: Availability of Courses By Grade**

What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? — (see chart below)




**Informatics: Curriculum Consistency**

Is the informatics curriculum in your country consistent across all schools or are there local differences? — State

**Informatics: Enrolment**

What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? — all students

**Digital Literacy: First Contact**

In which year do pupils have their first contact with computers or the internet in schools? — Primary

**Digital Literacy: A Separate Subject?**

Is digital literacy a separate subject or is it integrated in other subjects? — Separate subject

**Digital Literacy: Curriculum Consistency**

Is the digital literacy curriculum in your country consistent across all schools or are there local differences? — State

**Digital Literacy: Enrolment**

What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? — all students

**Teacher Training: Special Qualifications**

Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? — Special qualifications

**Teacher Training: Number of Subjects**

In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? — 2

**Teacher Training: Entry Requirement**

What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? — M.Ed. / M.Sc. + pgc.

**Teacher Training: In-Service Length**

How long is the in-service part of teacher training across all subjects? — 19-24 months

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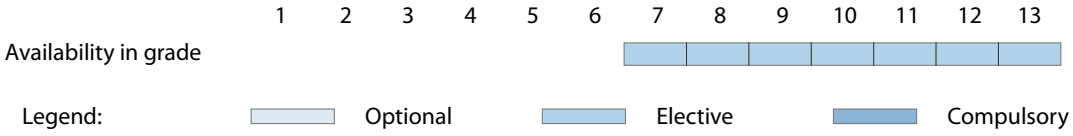
|---|---|
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | No |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | No |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | No |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | No |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | No |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | No |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | No |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | Tenure |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | State |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | State |

# Germany: Berlin

Germany is a federal republic consisting of sixteen federal states. All decisions regarding educational policies are made by the state ministries of education within the scope of federal regulations. Depending on which state, Digital Literacy is referred to as Informationstechnische Grundbildung, Informations- und kommunikationstechnische Grundbildung, or Medienkunde. Informatics is always referred to as Informatik.

| | |
|---|---|
| **Data Availability** | |
| What is the data availability status? | Data available |
| **Informatics: First Contact** | |
| What is the first year pupils are able to attend informatics courses? | Lower Secondary |
| **Informatics: Availability of Courses** | |
| Are Informatics courses offered in secondary schools leading to possible university entrance? | Yes |
| **Informatics: Availability of Courses By Grade** | |
| What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? | (see chart below) |




| | |
|---|---|
| **Informatics: Curriculum Consistency** | |
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | State |
| **Informatics: Enrolment** | |
| What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? | less than 10% |
| **Digital Literacy: First Contact** | |
| In which year do pupils have their first contact with computers or the internet in schools? | Primary |
| **Digital Literacy: A Separate Subject?** | |
| Is digital literacy a separate subject or is it integrated in other subjects? | Separate subject |
| **Digital Literacy: Curriculum Consistency** | |
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | School |
| **Digital Literacy: Enrolment** | |
| What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? | less than 10% |
| **Teacher Training: Special Qualifications** | |
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | Special qualifications |
| **Teacher Training: Number of Subjects** | |
| In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? | 2 |
| **Teacher Training: Entry Requirement** | |
| What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? | M.Ed. / M.Sc. + pgc. |
| **Teacher Training: In-Service Length** | |
| How long is the in-service part of teacher training across all subjects? | 13-18 months |

| | |
|---|---|
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | No |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | (Yes) |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Minor Training |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Minor Training |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | Minor Training |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | Minor Training |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | Minor Training |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | Tenure |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | State |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | State |

# Germany: Brandenburg

Germany is a federal republic consisting of sixteen federal states. All decisions regarding educational policies are made by the state ministries of education within the scope of federal regulations. Depending on which state, Digital Literacy is referred to as Informationstechnische Grundbildung, Informations- und kommunikationstechnische Grundbildung, or Medienkunde. Informatics is always referred to as Informatik.

**Data Availability**

What is the data availability status? — Data available

**Informatics: First Contact**

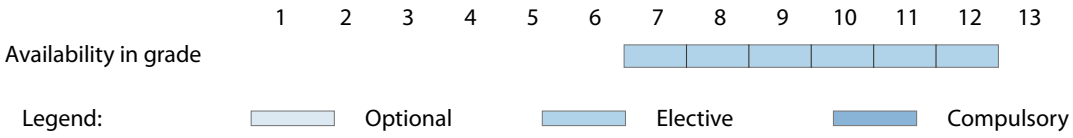
What is the first year pupils are able to attend informatics courses? — Lower Secondary

**Informatics: Availability of Courses**

Are Informatics courses offered in secondary schools leading to possible university entrance? — Yes

**Informatics: Availability of Courses By Grade**

What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? — (see chart below)




**Informatics: Curriculum Consistency**

Is the informatics curriculum in your country consistent across all schools or are there local differences? — State

**Informatics: Enrolment**

What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? — less than 10%

**Digital Literacy: First Contact**

In which year do pupils have their first contact with computers or the internet in schools? — Primary

**Digital Literacy: A Separate Subject?**

Is digital literacy a separate subject or is it integrated in other subjects? — Integrated

**Digital Literacy: Curriculum Consistency**

Is the digital literacy curriculum in your country consistent across all schools or are there local differences? — State

**Digital Literacy: Enrolment**

What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? — less than 10%

**Teacher Training: Special Qualifications**

Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? — Special qualifications

**Teacher Training: Number of Subjects**

In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? — 2

**Teacher Training: Entry Requirement**

What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? — M.Ed. / M.Sc. + pgc.

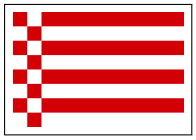
**Teacher Training: In-Service Length**

How long is the in-service part of teacher training across all subjects? — 13-18 months

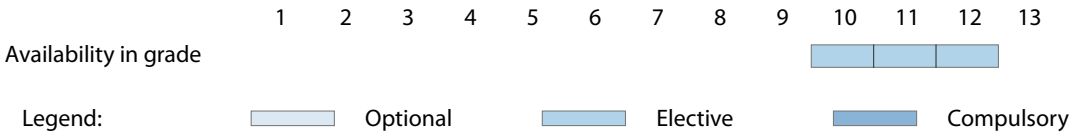
| | |
|---|---|
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | No |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | (Yes) |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Substantial Training |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Substantial Training |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | Substantial Training |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | Substantial Training |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | Substantial Training |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | Tenure |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | State |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | State |

# Germany: Bremen

Germany is a federal republic consisting of sixteen federal states. All decisions regarding educational policies are made by the state ministries of education within the scope of federal regulations. Depending on which state, Digital Literacy is referred to as Informationstechnische Grundbildung, Informations- und kommunikationstechnische Grundbildung, or Medienkunde. Informatics is always referred to as Informatik.



| | |
|---|---|
| **Data Availability** | |
| What is the data availability status? | Data available |
| **Informatics: First Contact** | |
| What is the first year pupils are able to attend informatics courses? | Higher Secondary |
| **Informatics: Availability of Courses** | |
| Are Informatics courses offered in secondary schools leading to possible university entrance? | Yes |
| **Informatics: Availability of Courses By Grade** | |
| What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? | (see chart below) |



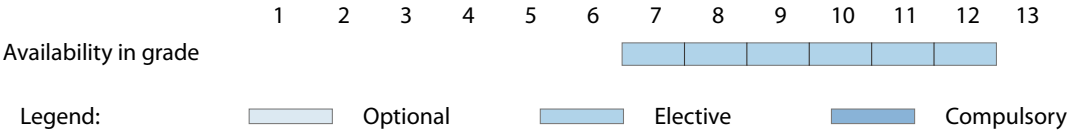

| | |
|---|---|
| **Informatics: Curriculum Consistency** | |
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | State |
| **Informatics: Enrolment** | |
| What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? | less than 10% |
| **Digital Literacy: First Contact** | |
| In which year do pupils have their first contact with computers or the internet in schools? | Primary |
| **Digital Literacy: A Separate Subject?** | |
| Is digital literacy a separate subject or is it integrated in other subjects? | Integrated |
| **Digital Literacy: Curriculum Consistency** | |
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | State |
| **Digital Literacy: Enrolment** | |
| What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? | all students |
| **Teacher Training: Special Qualifications** | |
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | Special qualifications |
| **Teacher Training: Number of Subjects** | |
| In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? | 2 |
| **Teacher Training: Entry Requirement** | |
| What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? | M.Ed. / M.Sc. + pgc. |
| **Teacher Training: In-Service Length** | |
| How long is the in-service part of teacher training across all subjects? | 13-18 months |

| | |
|---|---|
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | No |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | No |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | No |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | No |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | No |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | No |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | No |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | No |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | Tenure |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | State |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | State |

# Germany: Hamburg

Germany is a federal republic consisting of sixteen federal states. All decisions regarding educational policies are made by the state ministries of education within the scope of federal regulations. Depending on which state, Digital Literacy is referred to as Informationstechnische Grundbildung, Informations- und kommunikationstechnische Grundbildung, or Medienkunde. Informatics is always referred to as Informatik.

| | |
|---|---|
| **Data Availability** | |
| What is the data availability status? | Data available |
| **Informatics: First Contact** | |
| What is the first year pupils are able to attend informatics courses? | Lower Secondary |
| **Informatics: Availability of Courses** | |
| Are Informatics courses offered in secondary schools leading to possible university entrance? | Yes |
| **Informatics: Availability of Courses By Grade** | |
| What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? | (see chart below) |




| | |
|---|---|
| **Informatics: Curriculum Consistency** | |
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | State |
| **Informatics: Enrolment** | |
| What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? | less than 10% |
| **Digital Literacy: First Contact** | |
| In which year do pupils have their first contact with computers or the internet in schools? | Primary |
| **Digital Literacy: A Separate Subject?** | |
| Is digital literacy a separate subject or is it integrated in other subjects? | Integrated |
| **Digital Literacy: Curriculum Consistency** | |
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | School |
| **Digital Literacy: Enrolment** | |
| What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? | all students |
| **Teacher Training: Special Qualifications** | |
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | Special qualifications |
| **Teacher Training: Number of Subjects** | |
| In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? | 2 |
| **Teacher Training: Entry Requirement** | |
| What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? | M.Ed. / M.Sc. + pgc. |
| **Teacher Training: In-Service Length** | |
| How long is the in-service part of teacher training across all subjects? | 13-18 months |

| | |
|---|---|
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | No |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | (Yes) |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Minor Training |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Minor Training |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | Minor Training |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | Minor Training |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | Minor Training |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | Tenure |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | State |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | State |

# Germany: Hessen

Germany is a federal republic consisting of sixteen federal states. All decisions regarding educational policies are made by the state ministries of education within the scope of federal regulations. Depending on which state, Digital Literacy is referred to as Informationstechnische Grundbildung, Informations- und kommunikationstechnische Grundbildung, or Medienkunde. Informatics is always referred to as Informatik.

**Data Availability**

What is the data availability status? — Data available

**Informatics: First Contact**

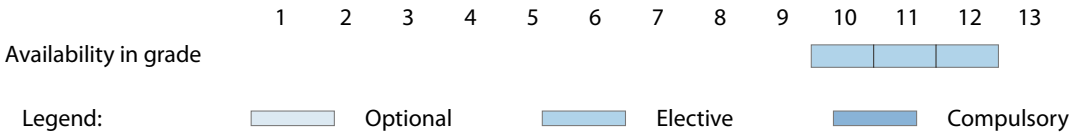
What is the first year pupils are able to attend informatics courses? — Higher Secondary

**Informatics: Availability of Courses**

Are Informatics courses offered in secondary schools leading to possible university entrance? — Yes

**Informatics: Availability of Courses By Grade**

What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? — (see chart below)




**Informatics: Curriculum Consistency**

Is the informatics curriculum in your country consistent across all schools or are there local differences? — State

**Informatics: Enrolment**

What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? — less than 10%

**Digital Literacy: First Contact**

In which year do pupils have their first contact with computers or the internet in schools? — Lower Secondary

**Digital Literacy: A Separate Subject?**

Is digital literacy a separate subject or is it integrated in other subjects? — Integrated

**Digital Literacy: Curriculum Consistency**

Is the digital literacy curriculum in your country consistent across all schools or are there local differences? — State

**Digital Literacy: Enrolment**

What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? — all students

**Teacher Training: Special Qualifications**

Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? — Special qualifications

**Teacher Training: Number of Subjects**

In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? — 2

**Teacher Training: Entry Requirement**

What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? — M.Ed. / M.Sc. + pgc.

**Teacher Training: In-Service Length**

How long is the in-service part of teacher training across all subjects? — 19-24 months

| | |
|---|---|
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | No |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | (Yes) |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | No |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | No |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | No |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | No |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | No |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | Tenure |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | State |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | State |

# Germany: Mecklenburg-Vorpommern

Germany is a federal republic consisting of sixteen federal states. All decisions regarding educational policies are made by the state ministries of education within the scope of federal regulations. Depending on which state, Digital Literacy is referred to as Informationstechnische Grundbildung, Informations- und kommunikationstechnische Grundbildung, or Medienkunde. Informatics is always referred to as Informatik.

**Data Availability**

| | |
|---|---|
| What is the data availability status? | Data available |

**Informatics: First Contact**

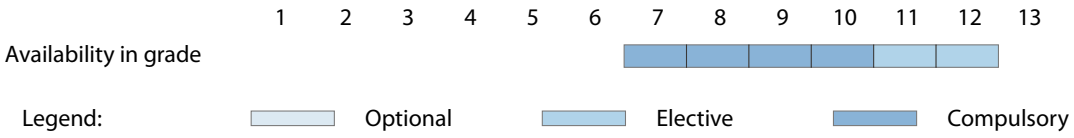
| | |
|---|---|
| What is the first year pupils are able to attend informatics courses? | Lower Secondary |

**Informatics: Availability of Courses**

| | |
|---|---|
| Are Informatics courses offered in secondary schools leading to possible university entrance? | Yes, compulsory II |

**Informatics: Availability of Courses By Grade**

| | |
|---|---|
| What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? | (see chart below) |




**Informatics: Curriculum Consistency**

| | |
|---|---|
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | State |

**Informatics: Enrolment**

| | |
|---|---|
| What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? | less than 10% |

**Digital Literacy: First Contact**

| | |
|---|---|
| In which year do pupils have their first contact with computers or the internet in schools? | Primary |

**Digital Literacy: A Separate Subject?**

| | |
|---|---|
| Is digital literacy a separate subject or is it integrated in other subjects? | Separate subject |

**Digital Literacy: Curriculum Consistency**

| | |
|---|---|
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | State |

**Digital Literacy: Enrolment**

| | |
|---|---|
| What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? | all students |

**Teacher Training: Special Qualifications**

| | |
|---|---|
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | Special qualifications |

**Teacher Training: Number of Subjects**

| | |
|---|---|
| In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? | 2 |

**Teacher Training: Entry Requirement**

| | |
|---|---|
| What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? | M.Ed. / M.Sc. + pgc. |

**Teacher Training: In-Service Length**

| | |
|---|---|
| How long is the in-service part of teacher training across all subjects? | 13-18 months |

| | |
|---|---|
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | No |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | (Yes) |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | Yes |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Minor Training |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Minor Training |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | Minor Training |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | Minor Training |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | Minor Training |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | Tenure |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | State |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | State |

# Germany: Niedersachsen

Germany is a federal republic consisting of sixteen federal states. All decisions regarding educational policies are made by the state ministries of education within the scope of federal regulations. Depending on which state, Digital Literacy is referred to as Informationstechnische Grundbildung, Informations- und kommunikationstechnische Grundbildung, or Medienkunde. Informatics is always referred to as Informatik.

**Data Availability**

What is the data availability status? — Data available

**Informatics: First Contact**

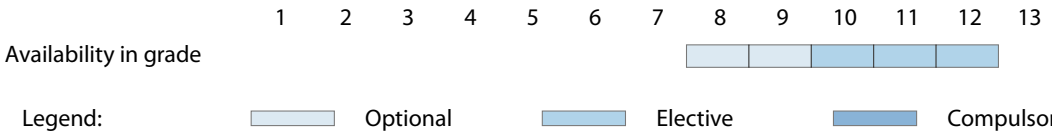
What is the first year pupils are able to attend informatics courses? — Lower Secondary

**Informatics: Availability of Courses**

Are Informatics courses offered in secondary schools leading to possible university entrance? — Yes

**Informatics: Availability of Courses By Grade**

What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? — (see chart below)




**Informatics: Curriculum Consistency**

Is the informatics curriculum in your country consistent across all schools or are there local differences? — State

**Informatics: Enrolment**

What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? — less than 10%

**Digital Literacy: First Contact**

In which year do pupils have their first contact with computers or the internet in schools? — Lower Secondary

**Digital Literacy: A Separate Subject?**

Is digital literacy a separate subject or is it integrated in other subjects? — Integrated

**Digital Literacy: Curriculum Consistency**

Is the digital literacy curriculum in your country consistent across all schools or are there local differences? — School

**Digital Literacy: Enrolment**

What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? — less than 10%

**Teacher Training: Special Qualifications**

Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? — Special qualifications

**Teacher Training: Number of Subjects**

In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? — 2

**Teacher Training: Entry Requirement**

What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? — M.Ed. / M.Sc. + pgc.

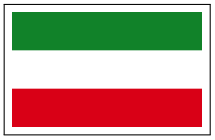
**Teacher Training: In-Service Length**

How long is the in-service part of teacher training across all subjects? — 13-18 months

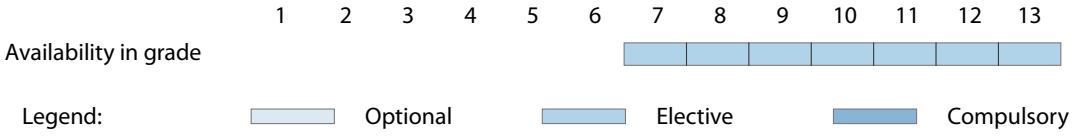
| | |
|---|---|
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | No |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | (Yes) |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Minor Training |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Minor Training |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | Minor Training |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | Minor Training |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | Minor Training |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | Tenure |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | State |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | State |

# Germany: Nordrhein-Westfalen

Germany is a federal republic consisting of sixteen federal states. All decisions regarding educational policies are made by the state ministries of education within the scope of federal regulations. Depending on which state, Digital Literacy is referred to as Informationstechnische Grundbildung, Informations- und kommunikationstechnische Grundbildung, or Medienkunde. Informatics is always referred to as Informatik.



| | |
|---|---|
| **Data Availability** | |
| What is the data availability status? | Data available |
| **Informatics: First Contact** | |
| What is the first year pupils are able to attend informatics courses? | Lower Secondary |
| **Informatics: Availability of Courses** | |
| Are Informatics courses offered in secondary schools leading to possible university entrance? | Yes |
| **Informatics: Availability of Courses By Grade** | |
| What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? | (see chart below) |




| | |
|---|---|
| **Informatics: Curriculum Consistency** | |
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | State |
| **Informatics: Enrolment** | |
| What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? | less than 10% |
| **Digital Literacy: First Contact** | |
| In which year do pupils have their first contact with computers or the internet in schools? | Primary |
| **Digital Literacy: A Separate Subject?** | |
| Is digital literacy a separate subject or is it integrated in other subjects? | Separate subject |
| **Digital Literacy: Curriculum Consistency** | |
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | State |
| **Digital Literacy: Enrolment** | |
| What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? | less than 10% |
| **Teacher Training: Special Qualifications** | |
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | Special qualifications |
| **Teacher Training: Number of Subjects** | |
| In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? | 2 |
| **Teacher Training: Entry Requirement** | |
| What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? | M.Ed. / M.Sc. + pgc. |
| **Teacher Training: In-Service Length** | |
| How long is the in-service part of teacher training across all subjects? | 13-18 months |

| | |
|---|---|
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | No |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | (Yes) |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Minor Training |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Minor Training |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | Minor Training |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | Minor Training |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | Minor Training |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | Tenure |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | State |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | State |

# Germany: Rheinland-Pfalz

Germany is a federal republic consisting of sixteen federal states. All decisions regarding educational policies are made by the state ministries of education within the scope of federal regulations. Depending on which state, Digital Literacy is referred to as Informationstechnische Grundbildung, Informations- und kommunikationstechnische Grundbildung, or Medienkunde. Informatics is always referred to as Informatik.

**Data Availability**

| | |
|---|---|
| What is the data availability status? | Data available |

**Informatics: First Contact**

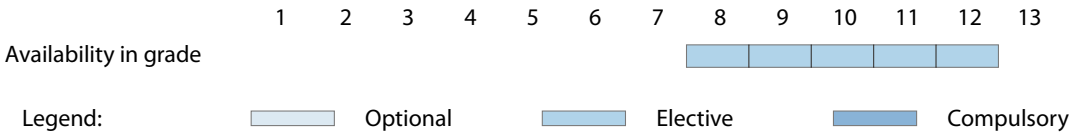
| | |
|---|---|
| What is the first year pupils are able to attend informatics courses? | Lower Secondary |

**Informatics: Availability of Courses**

| | |
|---|---|
| Are Informatics courses offered in secondary schools leading to possible university entrance? | Yes |

**Informatics: Availability of Courses By Grade**

| | |
|---|---|
| What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? | (see chart below) |




**Informatics: Curriculum Consistency**

| | |
|---|---|
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | State |

**Informatics: Enrolment**

| | |
|---|---|
| What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? | less than 10% |

**Digital Literacy: First Contact**

| | |
|---|---|
| In which year do pupils have their first contact with computers or the internet in schools? | Lower Secondary |

**Digital Literacy: A Separate Subject?**

| | |
|---|---|
| Is digital literacy a separate subject or is it integrated in other subjects? | Integrated |

**Digital Literacy: Curriculum Consistency**

| | |
|---|---|
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | School |

**Digital Literacy: Enrolment**

| | |
|---|---|
| What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? | less than 10% |

**Teacher Training: Special Qualifications**

| | |
|---|---|
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | Special qualifications |

**Teacher Training: Number of Subjects**

| | |
|---|---|
| In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? | 2 |

**Teacher Training: Entry Requirement**

| | |
|---|---|
| What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? | M.Ed. / M.Sc. + pgc. |

**Teacher Training: In-Service Length**

| | |
|---|---|
| How long is the in-service part of teacher training across all subjects? | 13-18 months |

| | |
|---|---|
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | No |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | (Yes) |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Minor Training |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Minor Training |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | Minor Training |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | Minor Training |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | Minor Training |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | Tenure |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | State |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | State |

# Germany: Saarland

Germany is a federal republic consisting of sixteen federal states. All decisions regarding educational policies are made by the state ministries of education within the scope of federal regulations. Depending on which state, Digital Literacy is referred to as Informationstechnische Grundbildung, Informations- und kommunikationstechnische Grundbildung, or Medienkunde. Informatics is always referred to as Informatik.

**Data Availability**

What is the data availability status? — Data available

**Informatics: First Contact**

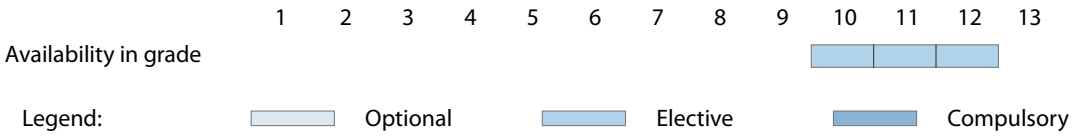
What is the first year pupils are able to attend informatics courses? — Higher Secondary

**Informatics: Availability of Courses**

Are Informatics courses offered in secondary schools leading to possible university entrance? — Yes

**Informatics: Availability of Courses By Grade**

What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? — (see chart below)




**Informatics: Curriculum Consistency**

Is the informatics curriculum in your country consistent across all schools or are there local differences? — State

**Informatics: Enrolment**

What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? — less than 10%

**Digital Literacy: First Contact**

In which year do pupils have their first contact with computers or the internet in schools? — Primary

**Digital Literacy: A Separate Subject?**

Is digital literacy a separate subject or is it integrated in other subjects? — Integrated

**Digital Literacy: Curriculum Consistency**

Is the digital literacy curriculum in your country consistent across all schools or are there local differences? — State

**Digital Literacy: Enrolment**

What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? — all students

**Teacher Training: Special Qualifications**

Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? — Special qualifications

**Teacher Training: Number of Subjects**

In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? — 2

**Teacher Training: Entry Requirement**

What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? — M.Ed. / M.Sc. + pgc.

**Teacher Training: In-Service Length**

How long is the in-service part of teacher training across all subjects? — 13-18 months

| | |
|---|---|
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | No |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | No |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | No |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | No |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | No |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | No |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | No |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | Tenure |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | State |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | State |

# Germany: Sachsen

Germany is a federal republic consisting of sixteen federal states. All decisions regarding educational policies are made by the state ministries of education within the scope of federal regulations. Depending on which state, Digital Literacy is referred to as Informationstechnische Grundbildung, Informations- und kommunikationstechnische Grundbildung, or Medienkunde. Informatics is always referred to as Informatik.

**Data Availability**

What is the data availability status? — Data available

**Informatics: First Contact**

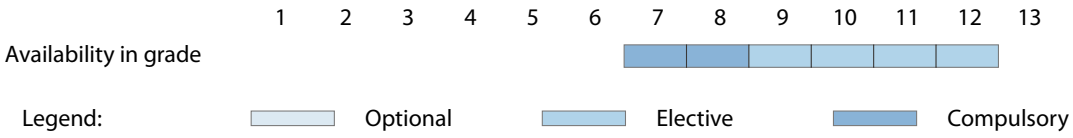
What is the first year pupils are able to attend informatics courses? — Lower Secondary

**Informatics: Availability of Courses**

Are Informatics courses offered in secondary schools leading to possible university entrance? — Yes, compulsory I

**Informatics: Availability of Courses By Grade**

What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? — (see chart below)




**Informatics: Curriculum Consistency**

Is the informatics curriculum in your country consistent across all schools or are there local differences? — State

**Informatics: Enrolment**

What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? — less than 10%

**Digital Literacy: First Contact**

In which year do pupils have their first contact with computers or the internet in schools? — Primary

**Digital Literacy: A Separate Subject?**

Is digital literacy a separate subject or is it integrated in other subjects? — Separate subject

**Digital Literacy: Curriculum Consistency**

Is the digital literacy curriculum in your country consistent across all schools or are there local differences? — State

**Digital Literacy: Enrolment**

What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? — all students

**Teacher Training: Special Qualifications**

Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? — Special qualifications

**Teacher Training: Number of Subjects**

In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? — 2

**Teacher Training: Entry Requirement**

What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? — M.Ed. / M.Sc. + pgc.

**Teacher Training: In-Service Length**

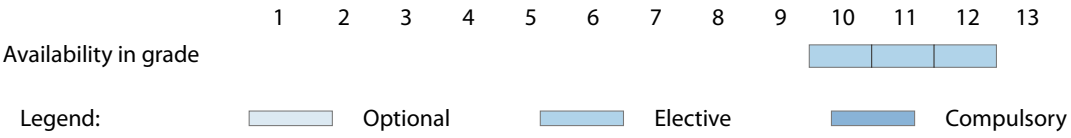
How long is the in-service part of teacher training across all subjects? — 7-12 months

| | |
|---|---|
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | No |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | (Yes) |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Substantial Training |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Substantial Training |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | Substantial Training |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | Substantial Training |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | Substantial Training |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | Tenure |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | State |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | State |

# Germany: Sachsen-Anhalt

Germany is a federal republic consisting of sixteen federal states. All decisions regarding educational policies are made by the state ministries of education within the scope of federal regulations. Depending on which state, Digital Literacy is referred to as Informationstechnische Grundbildung, Informations- und kommunikationstechnische Grundbildung, or Medienkunde. Informatics is always referred to as Informatik.

| | |
|---|---|
| **Data Availability** | |
| What is the data availability status? | Data available |
| **Informatics: First Contact** | |
| What is the first year pupils are able to attend informatics courses? | Higher Secondary |
| **Informatics: Availability of Courses** | |
| Are Informatics courses offered in secondary schools leading to possible university entrance? | Yes |
| **Informatics: Availability of Courses By Grade** | |
| What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? | (see chart below) |




| | |
|---|---|
| **Informatics: Curriculum Consistency** | |
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | State |
| **Informatics: Enrolment** | |
| What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? | less than 10% |
| **Digital Literacy: First Contact** | |
| In which year do pupils have their first contact with computers or the internet in schools? | Higher Secondary |
| **Digital Literacy: A Separate Subject?** | |
| Is digital literacy a separate subject or is it integrated in other subjects? | Separate subject |
| **Digital Literacy: Curriculum Consistency** | |
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | State |
| **Digital Literacy: Enrolment** | |
| What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? | less than 10% |
| **Teacher Training: Special Qualifications** | |
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | Special qualifications |
| **Teacher Training: Number of Subjects** | |
| In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? | 2 |
| **Teacher Training: Entry Requirement** | |
| What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? | M.Ed. / M.Sc. + pgc. |
| **Teacher Training: In-Service Length** | |
| How long is the in-service part of teacher training across all subjects? | 13-18 months |

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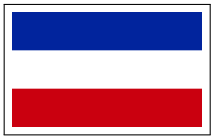
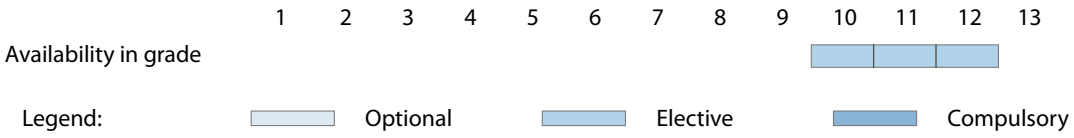
|---|---|
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | No |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | No |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Minor Training |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Minor Training |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | Minor Training |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | Minor Training |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | Minor Training |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | Tenure |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | State |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | State |

# Germany: Schleswig-Holstein

Germany is a federal republic consisting of sixteen federal states. All decisions regarding educational policies are made by the state ministries of education within the scope of federal regulations. Depending on which state, Digital Literacy is referred to as Informationstechnische Grundbildung, Informations- und kommunikationstechnische Grundbildung, or Medienkunde. Informatics is always referred to as Informatik.



| | |
|---|---|
| **Data Availability** | |
| What is the data availability status? | Data available |
| **Informatics: First Contact** | |
| What is the first year pupils are able to attend informatics courses? | Higher Secondary |
| **Informatics: Availability of Courses** | |
| Are Informatics courses offered in secondary schools leading to possible university entrance? | Yes |
| **Informatics: Availability of Courses By Grade** | |
| What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? | (see chart below) |

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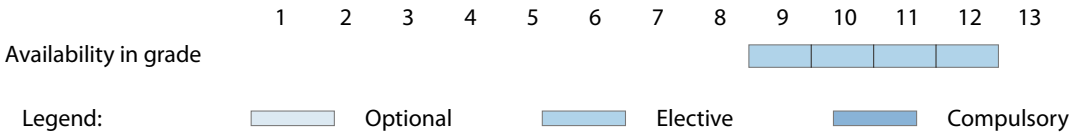
|---|---|
| **Informatics: Curriculum Consistency** | |
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | State |
| **Digital Literacy: First Contact** | |
| In which year do pupils have their first contact with computers or the internet in schools? | Primary |
| **Digital Literacy: A Separate Subject?** | |
| Is digital literacy a separate subject or is it integrated in other subjects? | Integrated |
| **Digital Literacy: Curriculum Consistency** | |
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | State |
| **Digital Literacy: Enrolment** | |
| What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? | all students |
| **Teacher Training: Special Qualifications** | |
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | Special qualifications |
| **Teacher Training: Number of Subjects** | |
| In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? | 2 |
| **Teacher Training: Entry Requirement** | |
| What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? | M.Ed. / M.Sc. + pgc. |
| **Teacher Training: In-Service Length** | |
| How long is the in-service part of teacher training across all subjects? | 13-18 months |
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | No |

| | |
|---|---|
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | (Yes) |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | No |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | No |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | No |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | No |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | No |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | Tenure |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | State |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | State |

# Germany: Thüringen

Germany is a federal republic consisting of sixteen federal states. All decisions regarding educational policies are made by the state ministries of education within the scope of federal regulations. Depending on which state, Digital Literacy is referred to as Informationstechnische Grundbildung, Informations- und kommunikationstechnische Grundbildung, or Medienkunde. Informatics is always referred to as Informatik.

| | |
|---|---|
| **Data Availability** | |
| What is the data availability status? | Data available |
| **Informatics: First Contact** | |
| What is the first year pupils are able to attend informatics courses? | Higher Secondary |
| **Informatics: Availability of Courses** | |
| Are Informatics courses offered in secondary schools leading to possible university entrance? | Yes |
| **Informatics: Availability of Courses By Grade** | |
| What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? | (see chart below) |

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|---|---|
| **Informatics: Curriculum Consistency** | |
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | State |
| **Informatics: Enrolment** | |
| What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? | less than 10% |
| **Digital Literacy: First Contact** | |
| In which year do pupils have their first contact with computers or the internet in schools? | Primary |
| **Digital Literacy: A Separate Subject?** | |
| Is digital literacy a separate subject or is it integrated in other subjects? | Integrated |
| **Digital Literacy: Curriculum Consistency** | |
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | State |
| **Digital Literacy: Enrolment** | |
| What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? | all students |
| **Teacher Training: Special Qualifications** | |
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | Special qualifications |
| **Teacher Training: Number of Subjects** | |
| In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? | 2 |
| **Teacher Training: Entry Requirement** | |
| What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? | M.Ed. / M.Sc. + pgc. |
| **Teacher Training: In-Service Length** | |
| How long is the in-service part of teacher training across all subjects? | 19-24 months |

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| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | No |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | No |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Minor Training |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Minor Training |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | Minor Training |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | Minor Training |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | Minor Training |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | Tenure |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | State |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | State |

# Greece

In Greece, the term used to describe Digital Literacy is Τεχνολογιες πληροφορικης και επικοινωνιων (Information and Communication Technology). Informatics is refered to as Πληροφορικη.

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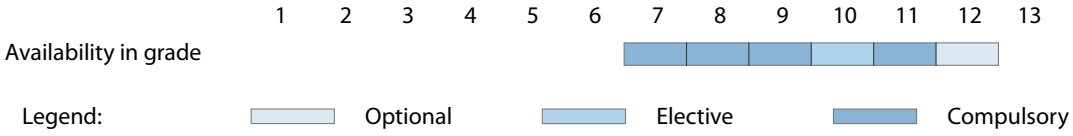
|---|---|
| **Data Availability** | |
| What is the data availability status? | Data available |
| **Informatics: First Contact** | |
| What is the first year pupils are able to attend informatics courses? | Lower Secondary |
| **Informatics: Availability of Courses** | |
| Are Informatics courses offered in secondary schools leading to possible university entrance? | Yes, compulsory II |
| **Informatics: Availability of Courses By Grade** | |
| What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? | (see chart below) |



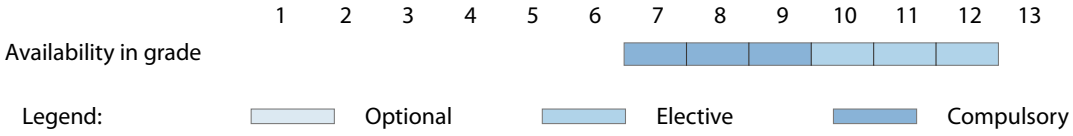

| | |
|---|---|
| **Informatics: Curriculum Consistency** | |
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | Country |
| **Informatics: Enrolment** | |
| What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? | all students |
| **Digital Literacy: First Contact** | |
| In which year do pupils have their first contact with computers or the internet in schools? | Primary |
| **Digital Literacy: A Separate Subject?** | |
| Is digital literacy a separate subject or is it integrated in other subjects? | Separate subject |
| **Digital Literacy: Curriculum Consistency** | |
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | Country |
| **Teacher Training: Special Qualifications** | |
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | Special qualifications |
| **Teacher Training: Number of Subjects** | |
| In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? | 1 |
| **Teacher Training: Entry Requirement** | |
| What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? | B.Ed. / B.Sc. + pgc. |
| **Teacher Training: In-Service Length** | |
| How long is the in-service part of teacher training across all subjects? | 19-24 months |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |

| | |
|---|---|
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | Yes |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | No |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | No |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | No |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | De facto SoE |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | Country |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | Country |

# Hungary

In Hungary Digital Literacy is refered to as Digitalis irastudas. The term for Informatics is Informatika.

| | |
|---|---|
| **Data Availability** | |
| What is the data availability status? | Data available |
| **Informatics: First Contact** | |
| What is the first year pupils are able to attend informatics courses? | Lower Secondary |
| **Informatics: Availability of Courses** | |
| Are Informatics courses offered in secondary schools leading to possible university entrance? | Combined |
| **Informatics: Availability of Courses By Grade** | |
| What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? | (see chart below) |

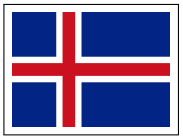



| | |
|---|---|
| **Informatics: Curriculum Consistency** | |
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | Country |
| **Digital Literacy: First Contact** | |
| In which year do pupils have their first contact with computers or the internet in schools? | Primary |
| **Digital Literacy: A Separate Subject?** | |
| Is digital literacy a separate subject or is it integrated in other subjects? | Separate subject |
| **Digital Literacy: Curriculum Consistency** | |
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | Country |
| **Digital Literacy: Enrolment** | |
| What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? | all students |
| **Teacher Training: Special Qualifications** | |
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | Special qualifications |
| **Teacher Training: Number of Subjects** | |
| In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? | 2 |
| **Teacher Training: Entry Requirement** | |
| What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? | M.Ed. / M.Sc. + pgc. |
| **Teacher Training: In-Service Length** | |
| How long is the in-service part of teacher training across all subjects? | 7-12 months |
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | No |

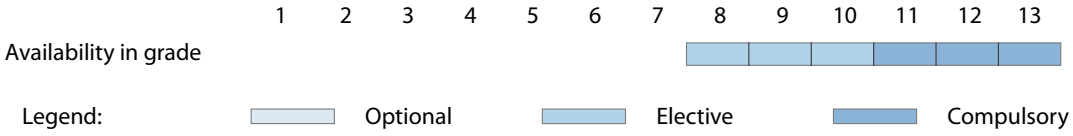
| | |
|---|---|
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | (Yes) |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | No |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | No |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | No |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | No |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | No |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | No SoE |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | Country |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | Region |

# Iceland

The term for Digital Literacy in Iceland is Upplysinga- og tæknimennt., Informatics is referred to as Upplysingatækni.



| | |
|---|---|
| **Data Availability** | |
| What is the data availability status? | Data available |
| **Informatics: First Contact** | |
| What is the first year pupils are able to attend informatics courses? | Lower Secondary |
| **Informatics: Availability of Courses** | |
| Are Informatics courses offered in secondary schools leading to possible university entrance? | Yes, but not for all |
| **Informatics: Availability of Courses By Grade** | |
| What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? | (see chart below) |

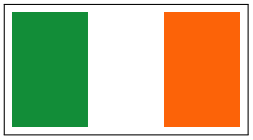



| | |
|---|---|
| **Informatics: Curriculum Consistency** | |
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | Country |
| **Informatics: Enrolment** | |
| What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? | less than 10% |
| **Digital Literacy: First Contact** | |
| In which year do pupils have their first contact with computers or the internet in schools? | Primary |
| **Digital Literacy: A Separate Subject?** | |
| Is digital literacy a separate subject or is it integrated in other subjects? | Separate subject |
| **Digital Literacy: Curriculum Consistency** | |
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | Country |
| **Digital Literacy: Enrolment** | |
| What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? | all students |
| **Teacher Training: Special Qualifications** | |
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | None |
| **Teacher Training: Number of Subjects** | |
| In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? | 1 |
| **Teacher Training: Entry Requirement** | |
| What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? | M.Ed. / M.Sc. + pgc. |
| **Teacher Training: In-Service Length** | |
| How long is the in-service part of teacher training across all subjects? | 1-6 months |

| | |
|---|---|
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | No |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | (Yes) |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | (Yes) |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Minor Training |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Minor Training |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | Minor Training |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | Minor Training |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | De facto SoE |

# Ireland

In Ireland, Digital Literacy is refered to as ICT whereas the term for Informatics is Coding.



| | |
|---|---|
| **Data Availability** | |
| What is the data availability status? | Data available |
| **Informatics: First Contact** | |
| What is the first year pupils are able to attend informatics courses? | Lower Secondary |
| **Informatics: Curriculum Consistency** | |
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | School |
| **Digital Literacy: First Contact** | |
| In which year do pupils have their first contact with computers or the internet in schools? | Primary |
| **Digital Literacy: A Separate Subject?** | |
| Is digital literacy a separate subject or is it integrated in other subjects? | Integrated |
| **Digital Literacy: Curriculum Consistency** | |
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | School |
| **Teacher Training: Special Qualifications** | |
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | Special qualifications |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | Country |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | Classroom |

# Israel

In Israel, Digital Literacy is refered to as . In schools a free translation of Computer Literacy or Computer Applications is used. Informatics is refered to as Computer Science.

**Data Availability**

| | |
|---|---|
| What is the data availability status? | Data available |

**Informatics: First Contact**

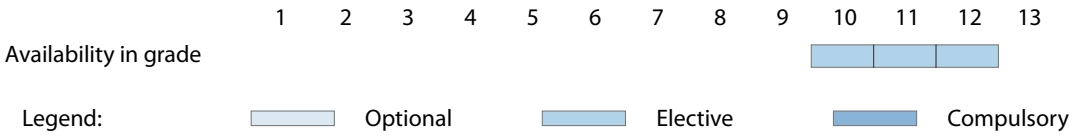
| | |
|---|---|
| What is the first year pupils are able to attend informatics courses? | Higher Secondary |

**Informatics: Availability of Courses**

| | |
|---|---|
| Are Informatics courses offered in secondary schools leading to possible university entrance? | Yes |

**Informatics: Availability of Courses By Grade**

| | |
|---|---|
| What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? | (see chart below) |




**Informatics: Curriculum Consistency**

| | |
|---|---|
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | Country |

**Informatics: Enrolment**

| | |
|---|---|
| What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? | 10-24% |

**Digital Literacy: First Contact**

| | |
|---|---|
| In which year do pupils have their first contact with computers or the internet in schools? | Primary |

**Digital Literacy: A Separate Subject?**

| | |
|---|---|
| Is digital literacy a separate subject or is it integrated in other subjects? | Integrated |

**Digital Literacy: Curriculum Consistency**

| | |
|---|---|
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | School |

**Digital Literacy: Enrolment**

| | |
|---|---|
| What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? | all students |

**Teacher Training: Special Qualifications**

| | |
|---|---|
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | Special qualifications |

**Teacher Training: Number of Subjects**

| | |
|---|---|
| In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? | 1 |

**Teacher Training: Entry Requirement**

| | |
|---|---|
| What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? | M.Ed. / M.Sc. + pgc. |

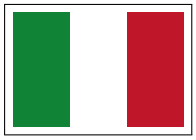
**Teacher Training: Stand-alone Informatics Curriculum**

| | |
|---|---|
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |

| | |
|---|---|
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | No |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | No |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | No |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | No |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | No |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | No |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | Tenure |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | Country |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | Country |

# Italy

In Italy, the term used for Digital Literacy is Alfabetizzazione digitale, Informatics is refered to as Informatica.



**Data Availability**

What is the data availability status? — Data available

**Informatics: First Contact**

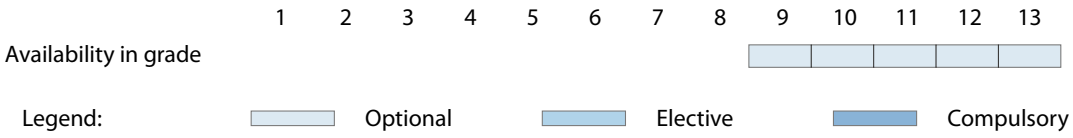
What is the first year pupils are able to attend informatics courses? — Higher Secondary

**Informatics: Availability of Courses**

Are Informatics courses offered in secondary schools leading to possible university entrance? — Yes, but not for all

**Informatics: Availability of Courses By Grade**

What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? — (see chart below)




**Informatics: Curriculum Consistency**

Is the informatics curriculum in your country consistent across all schools or are there local differences? — Country

**Informatics: Enrolment**

What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? — 10-24%

**Digital Literacy: First Contact**

In which year do pupils have their first contact with computers or the internet in schools? — Primary

**Digital Literacy: A Separate Subject?**

Is digital literacy a separate subject or is it integrated in other subjects? — Integrated

**Digital Literacy: Curriculum Consistency**

Is the digital literacy curriculum in your country consistent across all schools or are there local differences? — School

**Teacher Training: Special Qualifications**

Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? — Special qualifications

**Teacher Training: Number of Subjects**

In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? — 1

**Teacher Training: Entry Requirement**

What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? — M.Sc.

**Teacher Training: In-Service Length**

How long is the in-service part of teacher training across all subjects? — 1-6 months

**Teacher Training: Stand-alone Digital Literacy Curriculum**

Is there a stand-alone curriculum in teacher training? (Digital Literacy) — No

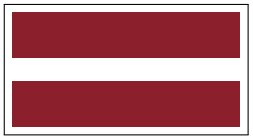
| | |
|---|---|
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | No |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Substantial Training |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Substantial Training |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | Substantial Training |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | Substantial Training |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | No |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | Tenure |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | Country |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | Country |

# Kosovo

| Data Availability | |
|---|---|
| What is the data availability status? | No data |

# Latvia

In Latvia, the term used for Digital Literacy is datorprasmes, Informatics is refered to as Informatika.



**Data Availability**

What is the data availability status? — Data available

**Informatics: First Contact**

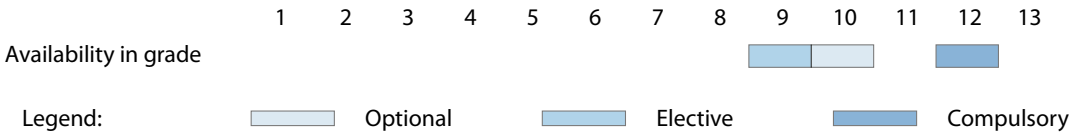
What is the first year pupils are able to attend informatics courses? — Higher Secondary

**Informatics: Availability of Courses**

Are Informatics courses offered in secondary schools leading to possible university entrance? — Yes, but not for all

**Informatics: Availability of Courses By Grade**

What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? — (see chart below)




**Informatics: Curriculum Consistency**

Is the informatics curriculum in your country consistent across all schools or are there local differences? — Country

**Informatics: Enrolment**

What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? — 25-49%

**Digital Literacy: First Contact**

In which year do pupils have their first contact with computers or the internet in schools? — Lower Secondary

**Digital Literacy: A Separate Subject?**

Is digital literacy a separate subject or is it integrated in other subjects? — Separate subject

**Digital Literacy: Curriculum Consistency**

Is the digital literacy curriculum in your country consistent across all schools or are there local differences? — Country

**Digital Literacy: Enrolment**

What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? — all students

**Teacher Training: Special Qualifications**

Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? — Special qualifications

**Teacher Training: Number of Subjects**

In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? — 2

**Teacher Training: Entry Requirement**

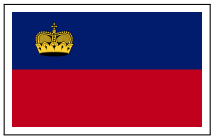
What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? — B.Sc.

**Teacher Training: In-Service Length**

How long is the in-service part of teacher training across all subjects? — 1-6 months

| | |
|---|---|
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | No |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | No |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | No |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Minor Training |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Minor Training |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | Minor Training |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | Minor Training |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | Minor Training |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | De facto SoE |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | Country |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | Country |

# Liechtenstein

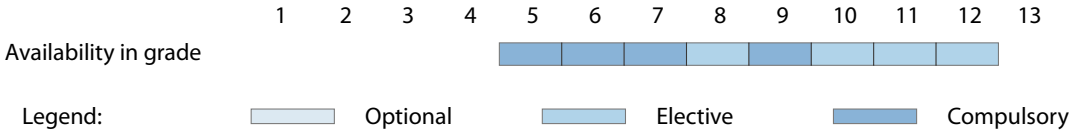


| Data Availability | |
|---|---|
| What is the data availability status? | No data |

# Lithuania

In Lithuania, the term used for Digital Literacy is Skaitmeninis Raštingumas. Informatics is refered to as Informatika or, recently, Informacinės.

| | |
|---|---|
| **Data Availability** | |
| What is the data availability status? | Data available |
| **Informatics: First Contact** | |
| What is the first year pupils are able to attend informatics courses? | Lower Secondary |
| **Informatics: Availability of Courses** | |
| Are Informatics courses offered in secondary schools leading to possible university entrance? | Yes |
| **Informatics: Availability of Courses By Grade** | |
| What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? | (see chart below) |




| | |
|---|---|
| **Informatics: Curriculum Consistency** | |
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | Country |
| **Informatics: Enrolment** | |
| What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? | 25-49% |
| **Digital Literacy: First Contact** | |
| In which year do pupils have their first contact with computers or the internet in schools? | Primary |
| **Digital Literacy: A Separate Subject?** | |
| Is digital literacy a separate subject or is it integrated in other subjects? | Integrated |
| **Digital Literacy: Curriculum Consistency** | |
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | Country |
| **Teacher Training: Special Qualifications** | |
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | Special qualifications |
| **Teacher Training: Number of Subjects** | |
| In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? | 1.5 |
| **Teacher Training: Entry Requirement** | |
| What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? | M.Ed. / M.Sc. + pgc. |
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | Yes |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |

| | |
|---|---|
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | (Yes) |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Minor Training |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Minor Training |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | Tenure |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | State |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | Region |

# Luxembourg

| Data Availability | |
|---|---|
| What is the data availability status? | No data |

# Macedonia

In Macedonia, Digital Literacy is called Дигитална писменост, which is a straight translation. Informatics is called Информатика ("Informatika").

**Data Availability**

What is the data availability status? — Data available

**Informatics: First Contact**

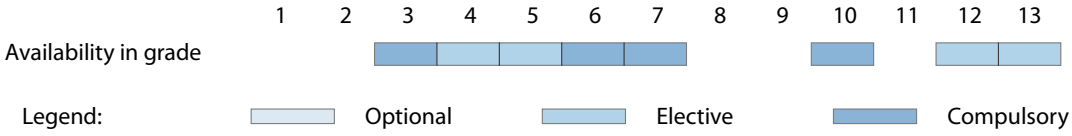
What is the first year pupils are able to attend informatics courses? — Lower Secondary

**Informatics: Availability of Courses**

Are Informatics courses offered in secondary schools leading to possible university entrance? — Yes, compulsory I

**Informatics: Availability of Courses By Grade**

What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? — (see chart below)




**Informatics: Curriculum Consistency**

Is the informatics curriculum in your country consistent across all schools or are there local differences? — Country

**Informatics: Enrolment**

What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? — all students

**Digital Literacy: First Contact**

In which year do pupils have their first contact with computers or the internet in schools? — Primary

**Digital Literacy: A Separate Subject?**

Is digital literacy a separate subject or is it integrated in other subjects? — Separate subject

**Digital Literacy: Curriculum Consistency**

Is the digital literacy curriculum in your country consistent across all schools or are there local differences? — Country

**Digital Literacy: Enrolment**

What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? — all students

**Teacher Training: Special Qualifications**

Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? — Special qualifications

**Teacher Training: Number of Subjects**

In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? — 1.5

**Teacher Training: Entry Requirement**

What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? — B.Ed. / B.Sc. + pgc.

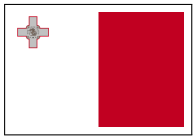
**Teacher Training: In-Service Length**

How long is the in-service part of teacher training across all subjects? — 1-6 months

| | |
|---|---|
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | No |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | (Yes) |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Minor Training |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Minor Training |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | Minor Training |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | Tenure |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | Country |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | Country |

# Malta

In Malta, the term used for Digital Literacy is ICT, Informatics is refered to as Computing.



**Data Availability**

What is the data availability status? — Data available

**Informatics: First Contact**

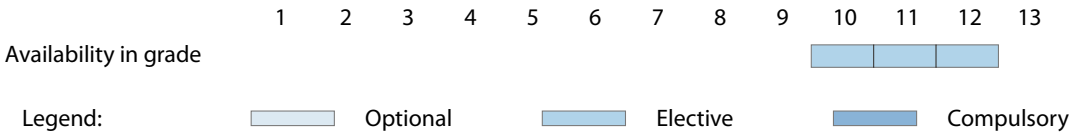
What is the first year pupils are able to attend informatics courses? — Lower Secondary

**Informatics: Availability of Courses**

Are Informatics courses offered in secondary schools leading to possible university entrance? — Yes

**Informatics: Availability of Courses By Grade**

What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? — (see chart below)




**Informatics: Curriculum Consistency**

Is the informatics curriculum in your country consistent across all schools or are there local differences? — Country

**Informatics: Enrolment**

What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? — all students

**Digital Literacy: First Contact**

In which year do pupils have their first contact with computers or the internet in schools? — Primary

**Digital Literacy: A Separate Subject?**

Is digital literacy a separate subject or is it integrated in other subjects? — Separate subject

**Digital Literacy: Curriculum Consistency**

Is the digital literacy curriculum in your country consistent across all schools or are there local differences? — Country

**Digital Literacy: Enrolment**

What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? — all students

**Teacher Training: Special Qualifications**

Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? — Special qualifications

**Teacher Training: Number of Subjects**

In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? — 1

**Teacher Training: Entry Requirement**

What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? — B.Ed. / B.Sc. + pgc.

**Teacher Training: In-Service Length**

How long is the in-service part of teacher training across all subjects? — 19-24 months

| | |
|---|---|
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | No |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | No |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | No |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | No |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | No |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | No |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | No |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | Tenure |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | State |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | School |

# Moldova

| Data Availability | |
|---|---|
| What is the data availability status? | No data |

# Monaco

| Data Availability | |
|---|---|
| What is the data availability status? | No data |

# Montenegro

| Data Availability | |
|---|---|
| What is the data availability status? | No data |

# Netherlands

In the Netherlands, the english term Digital Literacy is often used. Alternatives are Digitale geletterdheid and Mediawijsheid ("Media wisdom"). Informatics is refered to as Informatica.

**Data Availability**

What is the data availability status? — Data available

**Informatics: First Contact**

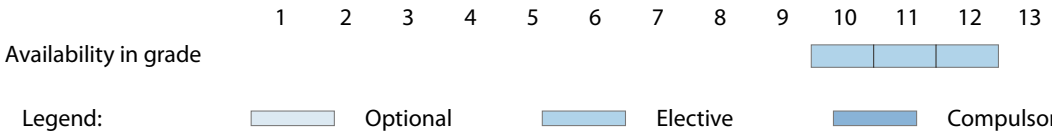
What is the first year pupils are able to attend informatics courses? — Higher Secondary

**Informatics: Availability of Courses**

Are Informatics courses offered in secondary schools leading to possible university entrance? — Yes, but not for all

**Informatics: Availability of Courses By Grade**

What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? — (see chart below)




**Informatics: Curriculum Consistency**

Is the informatics curriculum in your country consistent across all schools or are there local differences? — Country

**Informatics: Enrolment**

What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? — less than 10%

**Digital Literacy: First Contact**

In which year do pupils have their first contact with computers or the internet in schools? — Primary

**Digital Literacy: A Separate Subject?**

Is digital literacy a separate subject or is it integrated in other subjects? — Integrated

**Digital Literacy: Curriculum Consistency**

Is the digital literacy curriculum in your country consistent across all schools or are there local differences? — Country

**Teacher Training: Special Qualifications**

Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? — Special qualifications

**Teacher Training: Number of Subjects**

In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? — 1

**Teacher Training: Entry Requirement**

What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? — M.Ed. / M.Sc. + pgc.

**Teacher Training: In-Service Length**

How long is the in-service part of teacher training across all subjects? — 13-18 months

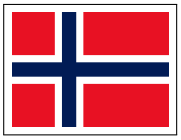
**Teacher Training: Stand-alone Digital Literacy Curriculum**

Is there a stand-alone curriculum in teacher training? (Digital Literacy) — Yes

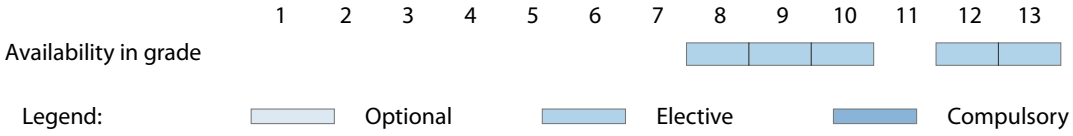
| | |
|---|---|
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | (Yes) |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | (Yes) |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | Tenure |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | Country |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | Country |

# Norway

In Norway, the term used for Digital Literacy is IT/ICT, which is a mixture of IT and CS. Informatics in schools is refered to as Informasjonsteknologiske (Information Technology).



| | |
|---|---|
| **Data Availability** | |
| What is the data availability status? | Data available |
| **Informatics: First Contact** | |
| What is the first year pupils are able to attend informatics courses? | Lower Secondary |
| **Informatics: Availability of Courses** | |
| Are Informatics courses offered in secondary schools leading to possible university entrance? | Yes, but not for all |
| **Informatics: Availability of Courses By Grade** | |
| What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? | (see chart below) |



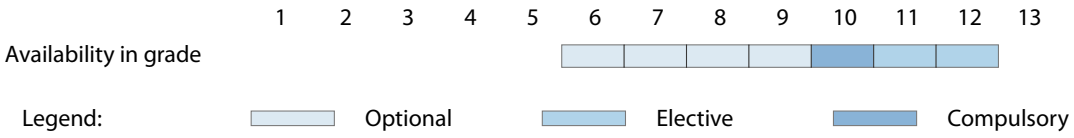

| | |
|---|---|
| **Informatics: Curriculum Consistency** | |
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | Country |
| **Informatics: Enrolment** | |
| What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? | less than 10% |
| **Digital Literacy: First Contact** | |
| In which year do pupils have their first contact with computers or the internet in schools? | Primary |
| **Digital Literacy: A Separate Subject?** | |
| Is digital literacy a separate subject or is it integrated in other subjects? | Separate subject |
| **Digital Literacy: Curriculum Consistency** | |
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | Country |
| **Teacher Training: Special Qualifications** | |
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | None |
| **Teacher Training: Number of Subjects** | |
| In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? | 1.5 |
| **Teacher Training: Entry Requirement** | |
| What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? | M.Sc. |
| **Teacher Training: In-Service Length** | |
| How long is the in-service part of teacher training across all subjects? | 1-6 months |
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | Yes |

| | |
|---|---|
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | (Yes) |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | (Yes) |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Minor Training |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Minor Training |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | Minor Training |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | De facto SoE |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | Country |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | Country |

# Poland

In Poland, the term used to describe Digital Literacy in schools is Computer classes (grades 1-6) or Information technology (in general). Informatics is refered to as Informatyka.

| | |
|---|---|
| **Data Availability** | |
| What is the data availability status? | Data available |
| **Informatics: First Contact** | |
| What is the first year pupils are able to attend informatics courses? | Lower Secondary |
| **Informatics: Availability of Courses** | |
| Are Informatics courses offered in secondary schools leading to possible university entrance? | Yes, compulsory II |
| **Informatics: Availability of Courses By Grade** | |
| What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? | (see chart below) |




| | |
|---|---|
| **Informatics: Curriculum Consistency** | |
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | Country |
| **Informatics: Enrolment** | |
| What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? | all students |
| **Digital Literacy: First Contact** | |
| In which year do pupils have their first contact with computers or the internet in schools? | Primary |
| **Digital Literacy: A Separate Subject?** | |
| Is digital literacy a separate subject or is it integrated in other subjects? | Separate subject |
| **Digital Literacy: Curriculum Consistency** | |
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | Country |
| **Digital Literacy: Enrolment** | |
| What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? | all students |
| **Teacher Training: Special Qualifications** | |
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | None |
| **Teacher Training: Number of Subjects** | |
| In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? | 1 |
| **Teacher Training: Entry Requirement** | |
| What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? | M.Sc. |
| **Teacher Training: In-Service Length** | |
| How long is the in-service part of teacher training across all subjects? | 13-18 months |

| | |
|---|---|
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | (Yes) |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Minor Training |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Minor Training |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | Minor Training |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | Minor Training |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | Minor Training |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | De facto SoE |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | Country |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | Country |

# Portugal

In Portugal, the terms Literacia Digital or Literacia Informática are used for Digital Literacy. Informatics is called Informática.

| | |
|---|---|
| **Data Availability** | |
| What is the data availability status? | Data available |
| **Informatics: First Contact** | |
| What is the first year pupils are able to attend informatics courses? | Higher Secondary |
| **Informatics: Curriculum Consistency** | |
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | Country |
| **Digital Literacy: First Contact** | |
| In which year do pupils have their first contact with computers or the internet in schools? | Lower Secondary |
| **Digital Literacy: A Separate Subject?** | |
| Is digital literacy a separate subject or is it integrated in other subjects? | Separate subject |
| **Digital Literacy: Curriculum Consistency** | |
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | Country |
| **Teacher Training: Special Qualifications** | |
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | None |

# Republic of Serbia

In Serbia, Digital Literacy is refered to as kompjuterska pismenost. The term used to describe Informatics is Informatika.

**Data Availability**

| | |
|---|---|
| What is the data availability status? | Data available |

**Informatics: First Contact**

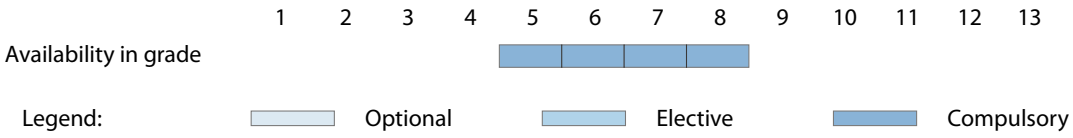
| | |
|---|---|
| What is the first year pupils are able to attend informatics courses? | Lower Secondary |

**Informatics: Availability of Courses**

| | |
|---|---|
| Are Informatics courses offered in secondary schools leading to possible university entrance? | Yes, compulsory II |

**Informatics: Availability of Courses By Grade**

| | |
|---|---|
| What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? | (see chart below) |




**Informatics: Curriculum Consistency**

| | |
|---|---|
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | Country |

**Informatics: Enrolment**

| | |
|---|---|
| What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? | all students |

**Digital Literacy: First Contact**

| | |
|---|---|
| In which year do pupils have their first contact with computers or the internet in schools? | Lower Secondary |

**Digital Literacy: A Separate Subject?**

| | |
|---|---|
| Is digital literacy a separate subject or is it integrated in other subjects? | Integrated |

**Digital Literacy: Curriculum Consistency**

| | |
|---|---|
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | Country |

**Teacher Training: Special Qualifications**

| | |
|---|---|
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | None |

**Teacher Training: Number of Subjects**

| | |
|---|---|
| In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? | 1 |

**Teacher Training: Entry Requirement**

| | |
|---|---|
| What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? | B.Sc. |

**Teacher Training: In-Service Length**

| | |
|---|---|
| How long is the in-service part of teacher training across all subjects? | 1-6 months |

**Teacher Training: Stand-alone Digital Literacy Curriculum**

| | |
|---|---|
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | No |

| | |
|---|---|
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | No |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Yes |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Yes |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | No |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | Yes |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | No |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | De facto SoE |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | Country |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | Country |

# Romania

In Romania, the term used to describe Digital Literacy is Alfabetizare digitala or Tehnologia informatiei si a comunicatiilor. Informatics is refered to as Informatica.

**Data Availability**

| | |
|---|---|
| What is the data availability status? | Data available |

**Informatics: First Contact**

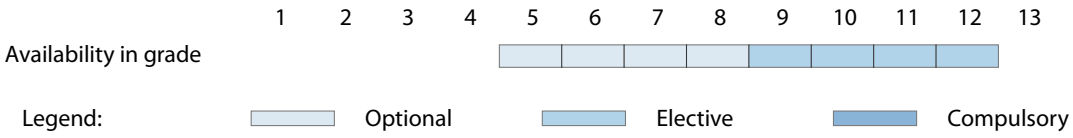
| | |
|---|---|
| What is the first year pupils are able to attend informatics courses? | Higher Secondary |

**Informatics: Availability of Courses**

| | |
|---|---|
| Are Informatics courses offered in secondary schools leading to possible university entrance? | Yes, but not for all |

**Informatics: Availability of Courses By Grade**

| | |
|---|---|
| What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? | (see chart below) |




**Informatics: Curriculum Consistency**

| | |
|---|---|
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | Country |

**Informatics: Enrolment**

| | |
|---|---|
| What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? | 10-24% |

**Digital Literacy: First Contact**

| | |
|---|---|
| In which year do pupils have their first contact with computers or the internet in schools? | Higher Secondary |

**Digital Literacy: A Separate Subject?**

| | |
|---|---|
| Is digital literacy a separate subject or is it integrated in other subjects? | Separate subject |

**Digital Literacy: Curriculum Consistency**

| | |
|---|---|
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | Country |

**Teacher Training: Special Qualifications**

| | |
|---|---|
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | Special qualifications |

**Teacher Training: Number of Subjects**

| | |
|---|---|
| In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? | 1 |

**Teacher Training: Entry Requirement**

| | |
|---|---|
| What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? | M.Ed. / M.Sc. + pgc. |

**Teacher Training: In-Service Length**

| | |
|---|---|
| How long is the in-service part of teacher training across all subjects? | 19-24 months |

**Teacher Training: Stand-alone Digital Literacy Curriculum**

| | |
|---|---|
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | No |

| | |
|---|---|
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | No |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | No |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | No |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | No |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | No |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | No |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | De facto SoE |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | Country |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | Country |

# Russia

In Russia, Digital Literacy is refered to as медиаграмотность (Media Literacy) / информационная культура (Information Culture). Informatics is refered to as Информатика ("Informatika").

**Data Availability**

| | |
|---|---|
| What is the data availability status? | Data available |

**Informatics: First Contact**

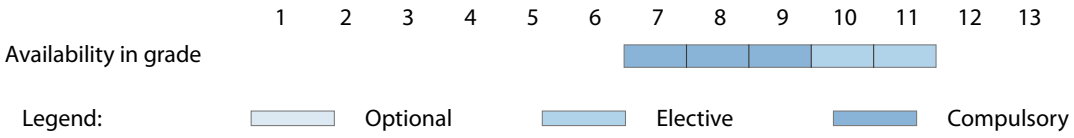
| | |
|---|---|
| What is the first year pupils are able to attend informatics courses? | Higher Secondary |

**Informatics: Availability of Courses**

| | |
|---|---|
| Are Informatics courses offered in secondary schools leading to possible university entrance? | Yes, compulsory II |

**Informatics: Availability of Courses By Grade**

| | |
|---|---|
| What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? | (see chart below) |




**Informatics: Curriculum Consistency**

| | |
|---|---|
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | Country |

**Informatics: Enrolment**

| | |
|---|---|
| What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? | all students |

**Digital Literacy: First Contact**

| | |
|---|---|
| In which year do pupils have their first contact with computers or the internet in schools? | Primary |

**Digital Literacy: A Separate Subject?**

| | |
|---|---|
| Is digital literacy a separate subject or is it integrated in other subjects? | Separate subject |

**Digital Literacy: Curriculum Consistency**

| | |
|---|---|
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | Country |

**Digital Literacy: Enrolment**

| | |
|---|---|
| What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? | all students |

**Teacher Training: Special Qualifications**

| | |
|---|---|
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | Special qualifications |

**Teacher Training: Number of Subjects**

| | |
|---|---|
| In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? | 1 |

**Teacher Training: Entry Requirement**

| | |
|---|---|
| What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? | M.Ed. / M.Sc. + pgc. |

**Teacher Training: In-Service Length**

| | |
|---|---|
| How long is the in-service part of teacher training across all subjects? | No in-service part |

| | |
|---|---|
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | Yes |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | (Yes) |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Yes |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Minor Training |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | No |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | Minor Training |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | Substantial Training |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | Tenure |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | Country |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | Country |

# San Marino

| Data Availability | |
|---|---|
| What is the data availability status? | No data |

# Slovakia

In Slovakia, Digital Literacy is refered to as Digitalna gramotnost ("Digital Literacy"), Pocitacova gramotnost ("Computer Literacy") or IKT zrucnosti ("ICT skills"). The term used to describe Informatics is Informatika.

**Data Availability**

What is the data availability status? — Data available

**Informatics: First Contact**

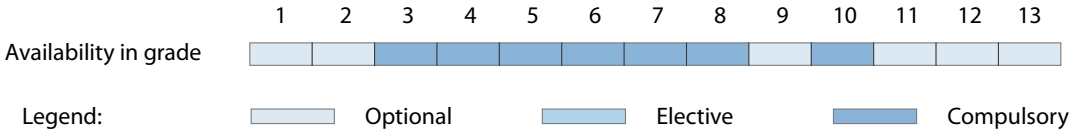
What is the first year pupils are able to attend informatics courses? — Lower Secondary

**Informatics: Availability of Courses**

Are Informatics courses offered in secondary schools leading to possible university entrance? — Yes, compulsory II

**Informatics: Availability of Courses By Grade**

What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? — (see chart below)




**Informatics: Curriculum Consistency**

Is the informatics curriculum in your country consistent across all schools or are there local differences? — Country

**Informatics: Enrolment**

What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? — all students

**Digital Literacy: First Contact**

In which year do pupils have their first contact with computers or the internet in schools? — Primary

**Digital Literacy: A Separate Subject?**

Is digital literacy a separate subject or is it integrated in other subjects? — Separate subject

**Digital Literacy: Curriculum Consistency**

Is the digital literacy curriculum in your country consistent across all schools or are there local differences? — Country

**Digital Literacy: Enrolment**

What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? — all students

**Teacher Training: Special Qualifications**

Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? — Special qualifications

**Teacher Training: Number of Subjects**

In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? — 2

**Teacher Training: Entry Requirement**

What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? — M.Sc.

**Teacher Training: In-Service Length**

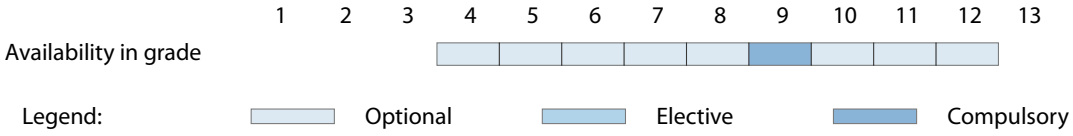
How long is the in-service part of teacher training across all subjects? — 1-6 months

| | |
|---|---|
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | (Yes) |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Yes |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Yes |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | Yes |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | Yes |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | Yes |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | Tenure |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | State |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | State |

# Slovenia

In Slovenia, the term used to describe Digital Literacy is Digitalna pismenost. Informatics is refered to as Racunalnistvo in informatika ("Computer Science and Informatics"). There is a distinction in terminology between Computer Science (Software and Hardware) and Informatics (Information Systems and Information Technology).

| | |
|---|---|
| **Data Availability** | |
| What is the data availability status? | Data available |
| **Informatics: First Contact** | |
| What is the first year pupils are able to attend informatics courses? | Primary |
| **Informatics: Availability of Courses** | |
| Are Informatics courses offered in secondary schools leading to possible university entrance? | Yes, compulsory I |
| **Informatics: Availability of Courses By Grade** | |
| What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? | (see chart below) |




| | |
|---|---|
| **Informatics: Curriculum Consistency** | |
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | Country |
| **Informatics: Enrolment** | |
| What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? | all students |
| **Digital Literacy: First Contact** | |
| In which year do pupils have their first contact with computers or the internet in schools? | Primary |
| **Digital Literacy: A Separate Subject?** | |
| Is digital literacy a separate subject or is it integrated in other subjects? | Integrated |
| **Teacher Training: Special Qualifications** | |
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | Special qualifications |
| **Teacher Training: Number of Subjects** | |
| In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? | 1 |
| **Teacher Training: Entry Requirement** | |
| What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? | M.Sc. |
| **Teacher Training: In-Service Length** | |
| How long is the in-service part of teacher training across all subjects? | No in-service part |
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | No |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |

| | |
|---|---|
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | Yes |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Substantial Training |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Substantial Training |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | Substantial Training |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | Substantial Training |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | Substantial Training |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | De facto SoE |

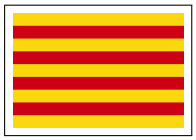
# Spain: Andalusia

In Spain, the term used for Digital Literacy is Alfabetizacion digital or Competencia Digital. Informatics is refered to as Informatica. While Spain has 17 autonomous communities and two autonomous cities, this map currently presents data for Catalonia and Madrid only (select from the region menu below). We are working hard to complete data coverage for Spain. Note that the autonomous communities and cities of Spain are second-level administrative units; hence, they correspond to what is called "states" in the Darmstadt model.

| **Data Availability** | |
|---|---|
| What is the data availability status? | No data |

# Spain: Aragon

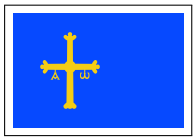
In Spain, the term used for Digital Literacy is Alfabetizacion digital or Competencia Digital. Informatics is refered to as Informatica. While Spain has 17 autonomous communities and two autonomous cities, this map currently presents data for Catalonia and Madrid only (select from the region menu below). We are working hard to complete data coverage for Spain. Note that the autonomous communities and cities of Spain are second-level administrative units; hence, they correspond to what is called "states" in the Darmstadt model.



| **Data Availability** | |
|---|---|
| What is the data availability status? | No data |

# Spain: Asturias

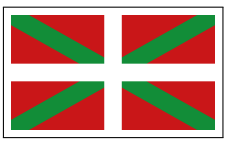
In Spain, the term used for Digital Literacy is Alfabetizacion digital or Competencia Digital. Informatics is refered to as Informatica. While Spain has 17 autonomous communities and two autonomous cities, this map currently presents data for Catalonia and Madrid only (select from the region menu below). We are working hard to complete data coverage for Spain. Note that the autonomous communities and cities of Spain are second-level administrative units; hence, they correspond to what is called "states" in the Darmstadt model.



| **Data Availability** | |
|---|---|
| What is the data availability status? | No data |

# Spain: Basque Country

In Spain, the term used for Digital Literacy is Alfabetizacion digital or Competencia Digital. Informatics is refered to as Informatica. While Spain has 17 autonomous communities and two autonomous cities, this map currently presents data for Catalonia and Madrid only (select from the region menu below). We are working hard to complete data coverage for Spain. Note that the autonomous communities and cities of Spain are second-level administrative units; hence, they correspond to what is called "states" in the Darmstadt model.



| **Data Availability** | |
|---|---|
| What is the data availability status? | No data |

# Spain: Cantabria

In Spain, the term used for Digital Literacy is Alfabetizacion digital or Competencia Digital. Informatics is refered to as Informatica. While Spain has 17 autonomous communities and two autonomous cities, this map currently presents data for Catalonia and Madrid only (select from the region menu below). We are working hard to complete data coverage for Spain. Note that the autonomous communities and cities of Spain are second-level administrative units; hence, they correspond to what is called "states" in the Darmstadt model.

| **Data Availability** | |
|---|---|
| What is the data availability status? | No data |

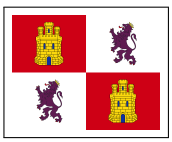
# Spain: Castile - La Mancha

In Spain, the term used for Digital Literacy is Alfabetizacion digital or Competencia Digital. Informatics is refered to as Informatica. While Spain has 17 autonomous communities and two autonomous cities, this map currently presents data for Catalonia and Madrid only (select from the region menu below). We are working hard to complete data coverage for Spain. Note that the autonomous communities and cities of Spain are second-level administrative units; hence, they correspond to what is called "states" in the Darmstadt model.

| **Data Availability** | |
|---|---|
| What is the data availability status? | No data |

# Spain: Castile and León

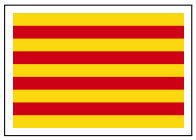
In Spain, the term used for Digital Literacy is Alfabetizacion digital or Competencia Digital. Informatics is refered to as Informatica. While Spain has 17 autonomous communities and two autonomous cities, this map currently presents data for Catalonia and Madrid only (select from the region menu below). We are working hard to complete data coverage for Spain. Note that the autonomous communities and cities of Spain are second-level administrative units; hence, they correspond to what is called "states" in the Darmstadt model.



| **Data Availability** | |
|---|---|
| What is the data availability status? | No data |

# Spain: Catalonia

In Spain, the term used for Digital Literacy is Alfabetizacion digital or Competencia Digital. Informatics is refered to as Informatica. While Spain has 17 autonomous communities and two autonomous cities, this map currently presents data for Catalonia and Madrid only (select from the region menu below). We are working hard to complete data coverage for Spain. Note that the autonomous communities and cities of Spain are second-level administrative units; hence, they correspond to what is called "states" in the Darmstadt model.



| | |
|---|---|
| **Data Availability** | |
| What is the data availability status? | Data available |
| **Informatics: First Contact** | |
| What is the first year pupils are able to attend informatics courses? | Lower Secondary |
| **Informatics: Curriculum Consistency** | |
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | State |
| **Digital Literacy: First Contact** | |
| In which year do pupils have their first contact with computers or the internet in schools? | Primary |
| **Digital Literacy: A Separate Subject?** | |
| Is digital literacy a separate subject or is it integrated in other subjects? | Separate subject |
| **Digital Literacy: Curriculum Consistency** | |
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | State |
| **Teacher Training: Special Qualifications** | |
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | Special qualifications |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | State |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | State |

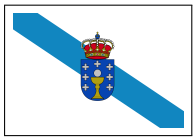
# Spain: Extremadura

In Spain, the term used for Digital Literacy is Alfabetizacion digital or Competencia Digital. Informatics is refered to as Informatica. While Spain has 17 autonomous communities and two autonomous cities, this map currently presents data for Catalonia and Madrid only (select from the region menu below). We are working hard to complete data coverage for Spain. Note that the autonomous communities and cities of Spain are second-level administrative units; hence, they correspond to what is called "states" in the Darmstadt model.

| **Data Availability** | |
|---|---|
| What is the data availability status? | No data |

# Spain: Galicia

In Spain, the term used for Digital Literacy is Alfabetizacion digital or Competencia Digital. Informatics is refered to as Informatica. While Spain has 17 autonomous communities and two autonomous cities, this map currently presents data for Catalonia and Madrid only (select from the region menu below). We are working hard to complete data coverage for Spain. Note that the autonomous communities and cities of Spain are second-level administrative units; hence, they correspond to what is called "states" in the Darmstadt model.



| **Data Availability** | |
|---|---|
| What is the data availability status? | No data |

# Spain: La Rioja

In Spain, the term used for Digital Literacy is Alfabetizacion digital or Competencia Digital. Informatics is refered to as Informatica. While Spain has 17 autonomous communities and two autonomous cities, this map currently presents data for Catalonia and Madrid only (select from the region menu below). We are working hard to complete data coverage for Spain. Note that the autonomous communities and cities of Spain are second-level administrative units; hence, they correspond to what is called "states" in the Darmstadt model.

| **Data Availability** | |
|---|---|
| What is the data availability status? | No data |

# Spain: Madrid

In Spain, the term used for Digital Literacy is Alfabetizacion digital or Competencia Digital. Informatics is refered to as Informatica. While Spain has 17 autonomous communities and two autonomous cities, this map currently presents data for Catalonia and Madrid only (select from the region menu below). We are working hard to complete data coverage for Spain. Note that the autonomous communities and cities of Spain are second-level administrative units; hence, they correspond to what is called "states" in the Darmstadt model.

| | |
|---|---|
| **Data Availability** | |
| What is the data availability status? | Data available |
| **Informatics: First Contact** | |
| What is the first year pupils are able to attend informatics courses? | Lower Secondary |
| **Informatics: Availability of Courses** | |
| Are Informatics courses offered in secondary schools leading to possible university entrance? | Yes, but not for all |
| **Informatics: Availability of Courses By Grade** | |
| What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? | No data |
| **Informatics: Curriculum Consistency** | |
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | State |
| **Digital Literacy: First Contact** | |
| In which year do pupils have their first contact with computers or the internet in schools? | Primary |
| **Digital Literacy: A Separate Subject?** | |
| Is digital literacy a separate subject or is it integrated in other subjects? | Separate subject |
| **Digital Literacy: Curriculum Consistency** | |
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | State |
| **Teacher Training: Special Qualifications** | |
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | Special qualifications |
| **Teacher Training: Entry Requirement** | |
| What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? | M.Ed. / M.Sc. + pgc. |
| **Teacher Training: In-Service Length** | |
| How long is the in-service part of teacher training across all subjects? | 1-6 months |
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | No |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | No |

| | |
|---|---|
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Yes |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Yes |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | Yes |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | Yes |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | Yes |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | Tenure |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | State |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | State |

# Spain: Murcia

In Spain, the term used for Digital Literacy is Alfabetizacion digital or Competencia Digital. Informatics is refered to as Informatica. While Spain has 17 autonomous communities and two autonomous cities, this map currently presents data for Catalonia and Madrid only (select from the region menu below). We are working hard to complete data coverage for Spain. Note that the autonomous communities and cities of Spain are second-level administrative units; hence, they correspond to what is called "states" in the Darmstadt model.

| **Data Availability** | |
|---|---|
| What is the data availability status? | No data |

# Spain: Navarre

In Spain, the term used for Digital Literacy is Alfabetizacion digital or Competencia Digital. Informatics is refered to as Informatica. While Spain has 17 autonomous communities and two autonomous cities, this map currently presents data for Catalonia and Madrid only (select from the region menu below). We are working hard to complete data coverage for Spain. Note that the autonomous communities and cities of Spain are second-level administrative units; hence, they correspond to what is called "states" in the Darmstadt model.

| **Data Availability** | |
|---|---|
| What is the data availability status? | No data |

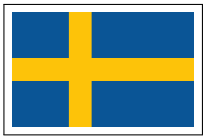
# Spain: Valencia

In Spain, the term used for Digital Literacy is Alfabetizacion digital or Competencia Digital. Informatics is refered to as Informatica. While Spain has 17 autonomous communities and two autonomous cities, this map currently presents data for Catalonia and Madrid only (select from the region menu below). We are working hard to complete data coverage for Spain. Note that the autonomous communities and cities of Spain are second-level administrative units; hence, they correspond to what is called "states" in the Darmstadt model.

| **Data Availability** | |
|---|---|
| What is the data availability status? | No data |

# Sweden

In Sweden, the term used for Digital Literacy is digital kompetens, sometimes IT-kompetens is also used. Informatics is refered to as Informationsteknologi or Informatik.



| | |
|---|---|
| **Data Availability** | |
| What is the data availability status? | Data available |
| **Informatics: First Contact** | |
| What is the first year pupils are able to attend informatics courses? | Higher Secondary |
| **Informatics: Availability of Courses** | |
| Are Informatics courses offered in secondary schools leading to possible university entrance? | No |
| **Informatics: Availability of Courses By Grade** | |
| What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? | (see chart below) |

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Availability in grade | | | | | | | | | | | | | |

Legend: Optional Elective Compulsory

| | |
|---|---|
| **Informatics: Curriculum Consistency** | |
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | School |
| **Digital Literacy: First Contact** | |
| In which year do pupils have their first contact with computers or the internet in schools? | Primary |
| **Digital Literacy: A Separate Subject?** | |
| Is digital literacy a separate subject or is it integrated in other subjects? | Integrated |
| **Digital Literacy: Curriculum Consistency** | |
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | Country |
| **Teacher Training: Special Qualifications** | |
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | None |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | No |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | No |

# Switzerland

In Switzerland, Digital Literacy is refered to as ICT. The term used for Informatics is Informatik.

**Data Availability**

What is the data availability status? — Data available

**Informatics: First Contact**

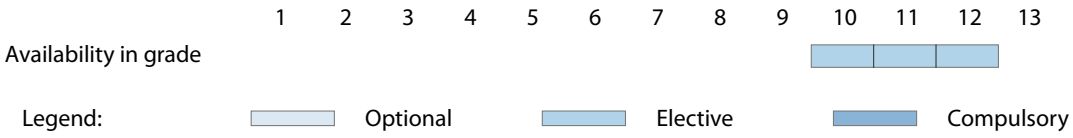
What is the first year pupils are able to attend informatics courses? — Lower Secondary

**Informatics: Availability of Courses**

Are Informatics courses offered in secondary schools leading to possible university entrance? — Yes

**Informatics: Availability of Courses By Grade**

What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? — (see chart below)




**Informatics: Curriculum Consistency**

Is the informatics curriculum in your country consistent across all schools or are there local differences? — State

**Informatics: Enrolment**

What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? — less than 10%

**Digital Literacy: A Separate Subject?**

Is digital literacy a separate subject or is it integrated in other subjects? — Integrated

**Digital Literacy: Curriculum Consistency**

Is the digital literacy curriculum in your country consistent across all schools or are there local differences? — School

**Teacher Training: Special Qualifications**

Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? — Special qualifications

**Teacher Training: Number of Subjects**

In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? — 1

**Teacher Training: Entry Requirement**

What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? — M.Sc.

**Teacher Training: In-Service Length**

How long is the in-service part of teacher training across all subjects? — 1-6 months

**Teacher Training: Stand-alone Digital Literacy Curriculum**

Is there a stand-alone curriculum in teacher training? (Digital Literacy) — No

**Teacher Training: Stand-alone Informatics Curriculum**

Is there a stand-alone curriculum in teacher training? (Informatics) — Yes

| | |
|---|---|
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | (Yes) |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Minor Training |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Minor Training |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | No |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | Minor Training |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | No |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | De facto SoE |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | State |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | State |

# Turkey

In Turkey, Digital Literacy is refered to as Dijital Okur-Yazarlık or Bilgisayar Okur-Yazarlıgı. There is a separate course named Bilisim Teknolojileri ve Yazılım ("Information and Communication Technologies and Software"). Bilisim is a short version of Bilgi (Information) and Iletisim (Communication). However, Bilisim is also used as a term for Informatics, together with Enformatik.

**Data Availability**

What is the data availability status? — Data available

**Informatics: First Contact**

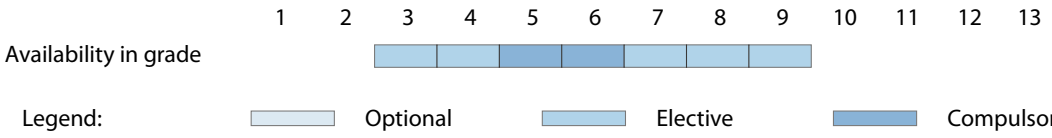
What is the first year pupils are able to attend informatics courses? — Lower Secondary

**Informatics: Availability of Courses**

Are Informatics courses offered in secondary schools leading to possible university entrance? — Yes

**Informatics: Availability of Courses By Grade**

What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? — (see chart below)




**Informatics: Curriculum Consistency**

Is the informatics curriculum in your country consistent across all schools or are there local differences? — Country

**Informatics: Enrolment**

What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? — all students

**Digital Literacy: First Contact**

In which year do pupils have their first contact with computers or the internet in schools? — Primary

**Digital Literacy: A Separate Subject?**

Is digital literacy a separate subject or is it integrated in other subjects? — Separate subject

**Digital Literacy: Curriculum Consistency**

Is the digital literacy curriculum in your country consistent across all schools or are there local differences? — Country

**Digital Literacy: Enrolment**

What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? — all students

**Teacher Training: Special Qualifications**

Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? — Special qualifications

**Teacher Training: Number of Subjects**

In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? — 1

**Teacher Training: Entry Requirement**

What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? — B.Ed. / B.Sc. + pgc.

**Teacher Training: In-Service Length**

How long is the in-service part of teacher training across all subjects? — No in-service part

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| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | No |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | (Yes) |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | (Yes) |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | De facto SoE |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | Country |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | Country |

# Ukraine

In Ukraine, Digital Literacy is refered to as Комп'ютерна грамотність, ("Komp'uterna hramotnist'", Computer Literacy). The term used for Informatics is Інформатика, ("Informatika").

| | |
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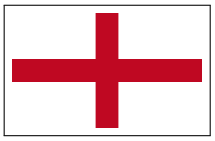
| **Data Availability** | |
| What is the data availability status? | Data available |
| **Informatics: First Contact** | |
| What is the first year pupils are able to attend informatics courses? | Primary |
| **Informatics: Curriculum Consistency** | |
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | Country |
| **Digital Literacy: First Contact** | |
| In which year do pupils have their first contact with computers or the internet in schools? | Primary |
| **Digital Literacy: A Separate Subject?** | |
| Is digital literacy a separate subject or is it integrated in other subjects? | Separate subject |
| **Digital Literacy: Curriculum Consistency** | |
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | School |
| **Teacher Training: Special Qualifications** | |
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | Special qualifications |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | Country |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | School |

# United Kingdom: England

Within the United Kingdom, there are different educational systems. While there are strong similarities between the systems in England, Wales and Northern Ireland, the Scottish system is different. In England there are three unofficial strands in the curriculum, which were adopted from the recommendations of the royal society report: Computer Science (Informatics), Information Technology and Digital Literacy. Underpinning all of those three strands in the UK, there is Computational Thinking. In the UK, Digital Literacy means social and digital responsibility, kind of ethics, the ethos of using computers in addition to the European definition, which is kind of alike driving the computer and the functionality in the use of the computers.



**Data Availability**

What is the data availability status? — Data available

**Informatics: First Contact**

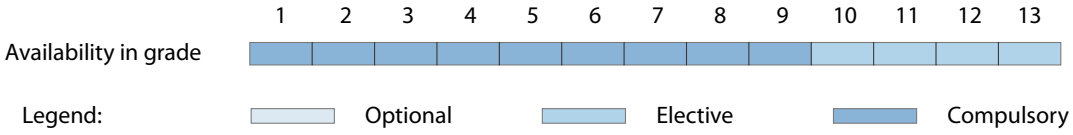
What is the first year pupils are able to attend informatics courses? — Primary

**Informatics: Availability of Courses**

Are Informatics courses offered in secondary schools leading to possible university entrance? — Yes, technically

**Informatics: Availability of Courses By Grade**

What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? — (see chart below)




**Informatics: Curriculum Consistency**

Is the informatics curriculum in your country consistent across all schools or are there local differences? — Country

**Informatics: Enrolment**

What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? — 75-99%

**Digital Literacy: First Contact**

In which year do pupils have their first contact with computers or the internet in schools? — Primary

**Digital Literacy: A Separate Subject?**

Is digital literacy a separate subject or is it integrated in other subjects? — Integrated

**Digital Literacy: Curriculum Consistency**

Is the digital literacy curriculum in your country consistent across all schools or are there local differences? — Country

**Digital Literacy: Enrolment**

What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? — all students

**Teacher Training: Special Qualifications**

Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? — Special qualifications

**Teacher Training: Number of Subjects**

In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? — 1.5

**Teacher Training: Entry Requirement**

What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? — B.Ed. / B.Sc. + pgc.

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| **Teacher Training: In-Service Length** | |
| How long is the in-service part of teacher training across all subjects? | 1-6 months |
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | No |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | (Yes) |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | Yes |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Yes |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Yes |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | Yes |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | Yes |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | Yes |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | De facto SoE |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | Country |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | Country |

# United Kingdom: Northern Ireland

Within the United Kingdom, there are different educational systems. While there are strong similarities between the systems in England, Wales and Northern Ireland, the Scottish system is different. In England there are three unofficial strands in the curriculum, which were adopted from the recommendations of the royal society report: Computer Science (Informatics), Information Technology and Digital Literacy. Underpinning all of those three strands in the UK, there is Computational Thinking. In the UK, Digital Literacy means social and digital responsibility, kind of ethics, the ethos of using computers in addition to the European definition, which is kind of alike driving the computer and the functionality in the use of the computers.

| | |
|---|---|
| **Data Availability** | |
| What is the data availability status? | Data available |
| **Informatics: First Contact** | |
| What is the first year pupils are able to attend informatics courses? | Primary |
| **Informatics: Availability of Courses** | |
| Are Informatics courses offered in secondary schools leading to possible university entrance? | Yes, technically |
| **Informatics: Availability of Courses By Grade** | |
| What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? | No data |
| **Informatics: Curriculum Consistency** | |
| Is the informatics curriculum in your country consistent across all schools or are there local differences? | Country |
| **Informatics: Enrolment** | |
| What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? | all students |
| **Digital Literacy: First Contact** | |
| In which year do pupils have their first contact with computers or the internet in schools? | Primary |
| **Digital Literacy: A Separate Subject?** | |
| Is digital literacy a separate subject or is it integrated in other subjects? | Integrated |
| **Digital Literacy: Curriculum Consistency** | |
| Is the digital literacy curriculum in your country consistent across all schools or are there local differences? | Country |
| **Digital Literacy: Enrolment** | |
| What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? | all students |
| **Teacher Training: Special Qualifications** | |
| Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? | Special qualifications |
| **Teacher Training: Number of Subjects** | |
| In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? | 1.5 |
| **Teacher Training: Entry Requirement** | |
| What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? | B.Ed. / B.Sc. + pgc. |
| **Teacher Training: In-Service Length** | |
| How long is the in-service part of teacher training across all subjects? | 13-18 months |

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| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | No |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | No |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Minor Training |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | No |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | No |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | No |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | No SoE |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | Country |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | Country |

# United Kingdom: Scotland

Within the United Kingdom, there are different educational systems. While there are strong similarities between the systems in England, Wales and Northern Ireland, the Scottish system is different. In England there are three unofficial strands in the curriculum, which were adopted from the recommendations of the royal society report: Computer Science (Informatics), Information Technology and Digital Literacy. Underpinning all of those three strands in the UK, there is Computational Thinking. In the UK, Digital Literacy means social and digital responsibility, kind of ethics, the ethos of using computers in addition to the European definition, which is kind of alike driving the computer and the functionality in the use of the computers.

**Data Availability**

What is the data availability status? — Data available

**Informatics: First Contact**

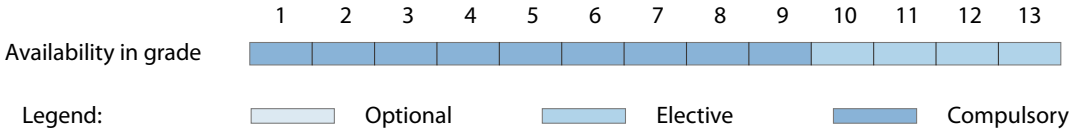
What is the first year pupils are able to attend informatics courses? — Primary

**Informatics: Availability of Courses**

Are Informatics courses offered in secondary schools leading to possible university entrance? — Yes

**Informatics: Availability of Courses By Grade**

What is the availability of stand-alone Informatics courses throughout the curriculum? Are they optional, elective, or compulsory? — (see chart below)




**Informatics: Curriculum Consistency**

Is the informatics curriculum in your country consistent across all schools or are there local differences? — Country

**Informatics: Enrolment**

What percentage of all students typically enrols in Informatics courses in the first two years of secondary education? — all students

**Digital Literacy: First Contact**

In which year do pupils have their first contact with computers or the internet in schools? — Primary

**Digital Literacy: A Separate Subject?**

Is digital literacy a separate subject or is it integrated in other subjects? — Separate subject

**Digital Literacy: Curriculum Consistency**

Is the digital literacy curriculum in your country consistent across all schools or are there local differences? — Country

**Digital Literacy: Enrolment**

What percentage of all students typically enrols in Digital Literacy courses during the first two years of secondary education? — all students

**Teacher Training: Special Qualifications**

Are there special studies for teaching Informatics in secondary schools and what is the emphasis on universities for informatics teachers? — Special qualifications

**Teacher Training: Number of Subjects**

In how many subjects (excl. Educational Sciences) is each secondary school teacher trained typically, i.e., across all subjects? — 1.5

**Teacher Training: Entry Requirement**

What is the typical formal requirement for entrance to the teaching profession for secondary schools (across all subjects)? — B.Ed. / B.Sc. + pgc.

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|---|---|
| **Teacher Training: In-Service Length** | |
| How long is the in-service part of teacher training across all subjects? | 7-12 months |
| **Teacher Training: Stand-alone Digital Literacy Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Digital Literacy) | Yes |
| **Teacher Training: Stand-alone Informatics Curriculum** | |
| Is there a stand-alone curriculum in teacher training? (Informatics) | Yes |
| **Teacher Training: Typical Path Availability** | |
| Is the typical training path for a secondary school teacher also available in Informatics? | Yes |
| **Teacher Training: Professionals as Teachers** | |
| Can a professional (software engineer) with a non-educational degree in Informatics and work experience can become an Informatics teacher? | (Yes) |
| **Teacher Training: Professional Experience** | |
| Can professional experience can be used to waive the formal subject qualifications typically required? | No |
| **Teacher Training: Mathematics Teachers** | |
| Is it possible to teach Informatics if you are a Mathematics teacher? | Yes |
| **Teacher Training: Physics Teachers** | |
| Is it possible to teach Informatics if you are a Physics teacher? | Yes |
| **Teacher Training: Business Teachers** | |
| Is it possible to teach Informatics if you are a Business teacher? | Yes |
| **Teacher Training: Engineering Teachers** | |
| Is it possible to teach Informatics if you are a Engineering teacher? | Yes |
| **Teacher Training: Teachers from other Disciplines** | |
| Is it possible to teach Informatics if you are a teacher in any other discipline than Mathematics, Physics, Business, or Engineering? | Yes |
| **Teacher Training: Security of Employment** | |
| What is the security of employment for teachers? | De facto SoE |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | Country |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | Country |

# United Kingdom: Wales

Within the United Kingdom, there are different educational systems. While there are strong similarities between the systems in England, Wales and Northern Ireland, the Scottish system is different. In England there are three unofficial strands in the curriculum, which were adopted from the recommendations of the royal society report: Computer Science (Informatics), Information Technology and Digital Literacy. Underpinning all of those three strands in the UK, there is Computational Thinking. In the UK, Digital Literacy means social and digital responsibility, kind of ethics, the ethos of using computers in addition to the European definition, which is kind of alike driving the computer and the functionality in the use of the computers.

| | |
|---|---|
| **Data Availability** | |
| What is the data availability status? | No data |
| **Educational Policies** | |
| At which administrative level are educational policy decisions being made? | Country |
| **Learning Objectives** | |
| At which level are learning objectives being defined? | Country |

# Vatican

| Data Availability | |
|---|---|
| What is the data availability status? | No data |

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