

Covid-19 policies and digitalisation in Austria – some basic information

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June 2020 (informal paper), update September 2020

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Introduction

This paper gives an overview about the Austrian policies in education during the first phase of the pandemic, and relates it to some basic information about digitalisation.

The information about the recent policies is mainly based on searches in the national media, and some preliminary survey results. The information about the state of digitalisation also considers comparative material mostly from the OECD.

In Part II emphasis is laid on the development of policies; web-based sources have sometimes been removed or changed since the time when they were found. For the purpose of accurate documentation, the original links have been included here, with a remark that they have been changed.

To some part the information has been updated end of September 2020, indicated in Subtitles

Summary (September 2020)

The pandemic has met Austrian education policy in a period of very much and contradictory reform activity, particularly in the school sector. Politics have turned almost completely to the management of the pandemic, namely security and health issues, and this is continued until now, with the reopening of schools and ECEC and higher education.

The various reform activities were somehow followed-up in the background.

The institutions had to cope with both, the changes in governance, assessment and several other aspects, and with the demands of the pandemic, in particular the shift to home schooling and distance education.

- ECEC institutions were more or less completely closed, pedagogies tried to some extent to hold contact with the children. Educational issues were more or less neglected
- In primary and lower secondary education, a two weeks summer school was created for disadvantaged students with a main focus on German language learning. The measure reached about half of the definite target group (low achievers in German), and in relation to the size of risk groups based on PISA it reached an order of magnitude of 15%-to-32%.
- In lower secondary education the reform of Mittelschule is implemented this year, that reinstates more severe tracking by permanent achievement groups
- In higher education some focus is laid on aspects of the development of digitalisation by research and development projects

A main effect of the pandemic is *the increase of inequalities among pupils and students*, as those with more privileged and more supportive background could better cope with the challenges. Compensation measures would therefore be important.

PART I: Covid-19 policies

1.0 Measures related to distance learning

Basically “**distance learning**” in the **school sector** included the following elements¹

- The **delivery of working material**, mainly assignments and explanations for repeating stuff (a “learning programme”); there was a general rule that new stuff should not be provided during the lock-down; the working material was generally provided on paper, to be taken home by the pupils on the last days before the lock down, through various kinds of contacts this material was supplemented, extended, etc. Digital methods were used according to the preferences and resources of schools and teachers
- **Seeking regular contact** by the teachers with all pupils through various media, often the rule was that every child should be reached at least once a week; the contact could be made through digital platforms if available (sometimes schools have established such platforms after the lock-down), or through chats, emails, telephone, etc.
- **Support of learning** of the pupils as much as possible; schools and teachers were quite free how to deliver their duties in practice, much depended on the motivation and the creativity of the teachers
- The teachers were **officially on duty** during the whole period, some at school, the majority in home office
- In principle **the schools were open**, and could be attended if needed, however, the public political messages were very strong to stay at home except in very urgent situations, somehow stigmatising those who took this opportunity (very few children, around 1% attended in fact schools)
- De facto **the families were responsible** for the support of the children; thus the support depended on the available resources of every kind in the families

In school education the social democratic party has proposed to supply tablets commonly for pupils of primary schools and laptops for secondary schools. This would have made the distance learning easier.

In **apprenticeship** the normal procedures should be followed, depending on how the work process in a firm was run, including short-term-work (Kurzarbeit)²

¹ There are several concrete descriptions available in the public about schooling during Corona:

<https://www.derstandard.at/story/2000116101059/schule-in-zeiten-von-corona>; <https://www.schulgschichtn.com/schuelerinnen-lockdown-nms-12052020/>; <https://www.schulgschichtn.com/distance-learning-mittelschule-28042020/>;
<https://www.schulgschichtn.com/unterricht-corona-mittelschule-09042020/>;
<https://www.derstandard.at/story/2000116565079/die-sorgen-und-aengste-der-schueler-im-lockdown>
<https://www.profil.at/oesterreich/coronakrise-schule-ideen-sammlung-11402369>
<https://grundschul-blog.de/homeschooling-in-oesterreich/>

² “Gibt es Corona-Kurzarbeit auch für Lehrlinge? Ja, das wurde nun ausdrücklich geregelt. In dieser Zeit bekommst du sogar das volle Lehrlingseinkommen weiterbezahlt. Deine Lehrzeit wird dadurch nicht verlängert. Du kannst also deine Ausbildung zum geplanten Zeitpunkt abschließen. / Wenn du in einem jetzt wichtigen Betrieb - wie etwa einer Bäckerei oder dem Lebensmittelhandel - arbeitest: Wenn deine Firma sich für Corona-Kurzarbeit entscheidet, gilt diese auch für dich.

In **higher education**, not much information is available about how the distance learning worked.

In **early education** the regions are responsible for practices, and – despite the programmatic rhetoric of transforming the caring institutions into educational institutions – distance learning in this sector has not been provided, rather the focus was on care and problems with caring for the small children at home.

1.1 Early childhood education and care

The educational purpose of early education institutions was not much emphasised so far during the crisis, rather the problems with care are foregrounded. The digital infrastructure is not a topic in the discourses.

In the Austrian practical-pedagogical discourses the specific qualities of early education are strongly contrasted to school learning.¹

The responsibility for caring has been delegated clearly to the parents, however, in principle they could send their children to the institutions if urgently necessary. There are signs that access has been made difficult in practice by bureaucratic restrictions (even a decree has been issued that the institutions should give access without bureaucratic hurdles if necessary).² A big issue was opening or closure of children's playgrounds in Vienna.³ Material has been issued by various players that give advice for coping with the situation in the families; however, for the children in early education learning was not explicitly mentioned in this material.⁴ However, the digital material provided some links to learning material among many materials about playing, reading, etc.⁵

The teacher education colleges have issued practical material for the personnel in early education institutions that focused on experiences and practices of how they could maintain contact with their children. This material shows indirectly that distance learning infrastructure has not been emphasised.⁶ The initiative for maintaining contacts was taken by individual employees, or by the principals.

1.2 Primary education

In primary school (grade 1-4) the digital infrastructure is less developed than in other sectors (see ANNEX 14.1). Some years ago, about 20% of primary schools provided open access to digital devices, 30% had WLAN in all rooms, and 10% had high speed internet. So digital practices are not very widespread.

In the descriptions of experiences there are examples of i-pad or laptop classes that could adapt easily to the conditions of distance education. In some cases schools have set new common communication

¹ <https://www.eltern-bildung.at/expert-inn-enstimmen/vorschularbeit-im-kindergarten/>

² <https://www.derstandard.at/story/2000116998234/anfang-vom-ende-der-schule-daheim>; https://www.meinbezirk.at/c-politik/schuloeffnung-mit-maskenpflicht-und-fuenf-kindern-pro-klasse-im-mai_a4038939; <https://kontrast.at/coronavirus-kindergarten-oeffnung/>

³ <https://www.oe24.at/coronavirus/Corona-Krise-Totale-Verwirrung-um-Spielplatz-Sperren/423560762>

⁴ Practical advice for parents: Commune of Vienna: <https://coronavirus.wien.gv.at/site/alltag-mit-kindern/>; NGO Kinderdorf <https://www.sos-kinderdorf.at/aktuelles/themen/familientipps/corona-tipps-fuer-eltern>

⁵ Learning resources early education https://eduthek.at/resource_details?full_data=0&resource_id=3296786&return_url=/schulmaterialien; <https://www.mompitz.de/>; <https://vs-material.wegerer.at/inhalt01.html>; <https://de.ixl.com/math/vorschule>; <https://www.technischesmuseum.at/das-digitale-museum>

⁶ Pedagogical material <https://kurier.at/kiku/in-zeiten-von-corona-bzw-covid19-gedichte-lieder-spiel-tipps-vor-allem-aber-kontakt/400818170>; <https://www.oedkh.at/>; <https://www.oedkh.at/files/2020-04-19-Koch-Presstext.pdf>; https://www.oedkh.at/files/Elementarpaedagogik-in-Coronazeiten_18042020_final.pdf

platforms at the beginning of the lock-down period. These practices demanded computers and internet access at home for all children.

A bottleneck was lack of infrastructure in the homes of pupils, in some cases being unavailable, in others scarce, when more than one child and the parents needed the devices for learning and work. For primary education valid data are not available.

1.3 General lower and upper-secondary education

Lower secondary education is tracked into the common school and the academic school, with the regions being responsible for the former and the central government for the latter. The general academic school comprises the lower and the upper secondary level.

The IT infrastructure is a bit better than in primary school, and in the academic school a bit better than in the common school (open access 25-30% of schools, common WLAN 40%, high speed internet 10-15%).

At this level preliminary data of an ongoing teacher survey are available (ANNEX 12.2.1), that show that in the view of teachers at least 12% of pupils could not be reached, and among disadvantaged pupils this proportion is more than one third (36%).

The city of Vienna has provided 5.000 laptops for pupils of the common school. As a second asset a common communication platform for all compulsory schools in Vienna is also be provided, which is installed on these devices.¹

The central government has also announced 12.000 laptops for the secondary schools under its responsibility.²

1.4 Higher education

In higher education the bottleneck is not so much the infrastructure but the experience and competences of the personnel.³ Main issues are how the semester will be tackled in terms of recognition of achievements and social support.⁴ It is announced to count the semester “neutral”, so if necessary achievements are not reached, the social support of students will not be cancelled or reduced.

1.4.1 Update September 2020, students' survey

Governance and policies in higher education is since some years based on institutional autonomy, and this seems to work quite well. The central authorities are financing the system based on performance agreements, and must coordinate their strategies with the institutions.

Recent policies in higher education have concentrated on the development and provision of legal underpinnings of coping with the pandemic by the autonomous higher education institutions (22 public universities, 14 PHs, 21 FHs, 16 private universities). The central government is responsible for the overall

¹ <https://wien.orf.at/stories/3044088/>; <https://www.spiegel.de/panorama/bildung/wien-5000-laptops-fuer-kinder-im-homeschooling-a-edebb27-5d30-425a-a31b-37cccd56a4b>

² https://www.kleinezeitung.at/international/corona/5793339/Schulen-schrittweise-oeffnen_Fassmann-verspricht-Laptops-fuer-Schueler

³ <https://www.spiegel.de/panorama/bildung/coronavirus-unis-in-oesterreich-schliessen-a-0fc37212-9df9-4ec4-84f4-a71c07c33e27>

⁴ https://www.kleinezeitung.at/international/corona/5793339/Schulen-schrittweise-oeffnen_Fassmann-verspricht-Laptops-fuer-Schueler

legal framework, and can only provide guidelines for the operational decisions of the institutions. The material applies to the current semesters and includes access and exam regulations, periods and requirements of grants and support, and a basic structure of four different modes of operation (Betriebsarten) for the institutions according to the states of the pandemic being determined to the degree of openness/closure of direct contacts vs. digital procedures (Präsenzbetrieb: normal with the general distance and hygiene requirements; Dualbetrieb: protection of specific groups; Hybridbetrieb: less direct contacts, digital provision of certain functions, Distance Betrieb: only digital contacts).¹

A commissioned study analysed the experiences of students with digitalisation and coping with the pandemic. This study gives some overview about the state of digitalisation, the changes in the course of the pandemic, and the coping of students with the challenges.²

- 90% or more of students own their devices, and feel sufficiently competent, however, almost 40% do not own a good internet access
- around 50% of students have experience with e-learning, however, among them a majority of 70% (one third of total) only occasionally (gelegentlich); *that means that less than 20% of Austrian students would have had more than occasional experience with e-learning at the outset.*
- 75% see a change of digital provisions, 75% of them (about 60% of total) see improvement; the pandemic has increased the provisions, about half of students have constantly used platforms (moodle), and use of further online tools has increased (interactive online courses, non-interactive online courses, online-exams, podcasts/blogs/videos); so, related to the pandemic changes, about half of students use digital devices constantly or more often (fast immer, öfter)
- overall one third to 40% of students have problems with their coping with the new conditions on several dimensions, including the changed study conditions, one fourth to one third have more severe problems, including financial ones; this result is very similar to the Univ.Vienna

The ministry has announced the results of this survey as great success; however, the students' representatives have taken up the mentioned survey with harsh criticism on the study conditions and in particular the low levels of digitalisation.³

A main focus of further policies in higher education has concerned digitalisation already before the pandemic (see overview in ANNEX 14.6):⁴

- OECD-report about innovation and entrepreneurship (Nov.2019)⁵

¹ BMBWF webpage https://www.bmbwf.gv.at/dam/jcr:5b480c18-85cb-40e2-974f-3edad8e65160/200819_Medieninfo_Leitfaden%20Hochschulen.pdf; BMBWF (2020) COVID-19: Leitfaden für den gesicherten Hochschulbetrieb. Empfehlungen für Universitäten, Fachhochschulen, Pädagogische Hochschulen und Privatuniversitäten (August) https://www.bmbwf.gv.at/dam/jcr:bd80b3e0-1aed-4e32-bade-1c3afe0ad148/200826_COVID-Leitfaden_FINAL.pdf

² BMBWF webpage https://www.bmbwf.gv.at/Themen/HS-Uni/Aktuelles/corona/corona_online-befragung_studierende.html; presentation: Hajek, Peter Hajek; Kernecker, Theresa (2020) CoV19 Maßnahmen BMBWF. Online Befragung Studierende https://www.bmbwf.gv.at/dam/jcr:71063eaf-86d1-4d80-8d31-d023cdbbcd0e/Pr%C3%A4sentation_Studierende_Corona_Krise.pdf

³ APA-OTS (04.05.2020) ÖH: Universitätsstudie bestätigt Mängel im Hochschulbereich Verzögerungen und Unsicherheit im Studium sind fatal https://www.ots.at/presseaussendung/OTS_20200504_OTS0154/oeh-universitaetsstudie-bestaeigt-maengel-im-hochschulbereich

⁴ See overview about the current topics BMBWF webpage, Aktuelles <https://www.bmbwf.gv.at/Themen/HS-Uni/Aktuelles.html>

⁵ BMBWF webpage <https://www.bmbwf.gv.at/Themen/HS-Uni/Aktuelles/Die-OECD-best%C3%A4tigt--%C3%96sterreichs-Hochschulen-treiben-Innovation-und-Entrepreneurship-erfolgreich-voran.html>

- Whitebook learning analytics (Nov.2019)¹
- Development programme digital transformation (Jan.2020), 35 interinstitutional projects for 50 million EURO, provided till end of 2024²
- University sector development plan 2022-27(Dec.2019), indicators will be presented in October 2020³

This overview suggests, that gaps with digitalisation in higher education might be bigger than suggested at the political level, the strength of initiatives taken is difficult to appraise in its impact.

2.0 September 2020 update for compensation measures and forward looking

2.1 Summer schools 2020

The summer school was a measure in before starting the school year 2020/21, spanning primary and lower secondary education. A version of summer schools has been provided to make a small compensation for the substantially reduced instruction because of the pandemic for (disadvantaged) pupils with learning difficulties.⁴ The basic profile was to provide half-day (8-to-12 o'clock, overall around 40 hours) instruction for two weeks for pupils with very low grades or need of support in German language at the end of the holidays. At the outset teacher-education students should do much of the work in co-operation with teachers. All actors (schools/principals, teachers, teacher-education students, pupils) were in principle invited to enrol voluntarily in this measure, however, with the application the participation became compulsory till the end. The focus was on German language learning, recommended was using a project-oriented methodology that included other topics/subjects as well.

Pupils with a poor record were invited to participate in the measure by their schools/teachers, and their participation had to be approved by their school/teacher. The target group was

- non-regular pupils
- pupils with grades 4 or 5 in German subject
- pupils with special need for support in German language learning

¹ BMBWF webpage <https://www.bmbwf.gv.at/Themen/HS-Uni/Aktuelles/Learning-Analytics-n%C3%BCtzen-dem-Hochschulsystem,-vor-allem-aber-den-Studierenden.html>; Leitner, P. et al. (2019) Learning Analytics: Einsatz an österreichischen Hochschulen Arbeitsgruppe Learning Analytics des Forum Neue Medien in der Lehre Austria. <https://www.fnma.at/content/download/1896/8814>

² BMBWF webpage <https://www.bmbwf.gv.at/Themen/HS-Uni/Aktuelles/Nachbericht-Digitalisierung.html>

³ BMBWF webpage <https://www.bmbwf.gv.at/Themen/HS-Uni/Aktuelles/Neuaufage-des-Gesamt%C3%BCsterreichischen-Universit%C3%A4tsentwicklungsplans-GUEP-2022-bis-2027.html>; BMBWF (2019) Der Gesamtösterreichische Universitätsentwicklungsplan 2022 – 2027 (December) <https://www.bmbwf.gv.at/dam/jcr:3a22c2b2-45d1-49dd-8898-112d44d0d39c/GUEP%202022%20-%202027.pdf>

⁴ Kurier, Johanna Hager (05.06.2020) Sommerschule in Österreich: So funktioniert der Unterricht für 42.000 Schüler. Erstmals soll es in Österreich für 6- bis 14-Jährige in je zwei Ferienwochen von 8 bis 12 Uhr Unterricht geben. <https://kurier.at/politik/inland/sommerschule-in-oesterreich-so-funktioniert-der-unterricht-fuer-42000-schueler/400931984>; Standard (27.07.2020) Sommerschule: Wien, Steiermark, Salzburg und Oberösterreich suchen noch Lehrer. Rund 23.000 Schüler haben sich für das Angebot in den letzten beiden Ferienwochen angemeldet. Es soll vor allem der Deutschförderung dienen. <https://www.derstandard.at/story/2000118994114/sommerschule-wien-steiermark-salzburg-und-oberoesterreich-suchen-noch-lehrer>

ÖIF-Integrationsfonds (webpage) Elternkurse <https://www.integrationsfonds.at/kurse/elternkurse>; BMBWF webpage <https://www.bmbwf.gv.at/Themen/schule/beratung/corona/sommerschule.html> (also from www.sommerschule.gv.at); Vienna Press-Service, Archive (20.07.2020) Sommerschule 2020 in Wien: 100 PädagogInnen gesucht! <https://www.wien.gv.at/presse/2020/07/20/sommerschule-2020-in-wien-100-paedagoginnen-gesucht>

The engagement of pupils in the summer school was rewarded by recognition as co-operation (Mitarbeit) in the assessment of the beginning school year. Teacher education students were recruited by their education institutions (universities, PHs), and prepared through short programmes, their participation was formally counted as a course for which they received 5 ECTS (125 hours), and no financial remuneration. Teachers received overtime remuneration. An additional aspect was the involvement of older pupils from the schools as “buddies” to help their colleagues with learning, also being rewarded by positive co-operation assessment; no more detailed information is unfortunately available about this aspect. The summer school was in principle also combined with a supply of a one-evening course for the parents that provides general info about the necessity of education and German language learning (something parents probably really are not aware of...).¹

At the outset the size of the target group was specified with 42.000 students from compulsory schools and lower secondary AHS, about 24.000 pupils (57%) have actually applied to the measure.

Tables in ANNEX 14.5 illustrate the amount of resources devoted to the summer schools, and relate this initiative to some overall figures of schools, teachers and students, and to the measurement of the social index by AK/Statistics Austria. The info by the ministry² gives 560 sites serving 24.000 pupils at 1.800 groups, meaning that on average 3 groups at a site provided instruction/learning for 40 students (13 per group). The info from the map gives a smaller number of 470 sites (about 11% of schools involved), 270 at primary schools (9%) and 200 at secondary schools (18% of NMS, however, AHS have also been involved, their inclusion would reduce the proportion somewhat).³ The participant numbers amount to about 5% of primary and lower secondary NMS pupils, and the involved teachers amount to about 4% of compulsory schools teachers, the personnel was about doubled by students' services. If the number of sites is related to the number and proportion of severely disadvantaged schools the overall numbers are somewhat higher at the primary level (270 to 209) and similar at the lower secondary level (200 to 189), however, the relationship differs very much by regions. In particular in Vienna, where the number of disadvantaged schools is very high, the number of summer school sites is comparatively low. So, given the information (which might be incomplete), the sites in Vienna would have been very large and personnel might have been difficult to find (the numerical relationships based on the average structure result for Vienna in 15 groups per site with only 12 personnel units). In some regions (Salzburg, Carinthia) the number of summer school sites is up to 5 or 8 times higher than the number of disadvantaged schools (which in turn ranges between zero in Burgenland and 50% in Vienna).

The summer schools have received positive resonance in the public. The stakeholders' views were mixed as the policy breaks to some extent a taboo by shifting work into the holidays; however, given the emergency strains from the pandemic, there was no open resistance. Organisation issues were raised, e.g., about the conditions of financing, and students' representatives also raised this issue of financial compensation. Another criticism questions the legal basis of some of the aspects, e.g., the recognition of this voluntary engagement outside of formal school in the assessment process during the new school year. The concrete shape of the measure was criticised because of a one-sided focus on German language learning, as many pupils also have needs in other learning fields.

¹ „Das Angebot für die Eltern soll ‚Stellenwert der Bildung in Österreich, die Wichtigkeit Deutsch zu lernen, die Grundzüge des österreichischen Bildungssystems, die Bedeutung der Mitwirkung von Eltern am Bildungsweg ihrer Kinder sowie Bildungsmöglichkeiten für Schüler‘ aufzeigen. <https://kurier.at/politik/inland/sommerschule-in-oesterreich-so-funktioniert-der-unterricht-fuer-42000-schueler/400931984>; see also <https://www.integrationsfonds.at/kurse/elternkurse>“

² BMBWF website <https://www.bmbwf.gv.at/Themen/schule/beratung/corona/sommerschule.html>, map <https://map.sommerschule.gv.at/>

³ There are indications that in Vienna mainly academic schools were organising lower secondary summer schools; which kinds of pupils they enrolled is not known.

The new “integration report 2020” (which might also be termed “separation report”) again, and much echoed by the media, separates out the – already well-known – problems and deficits of migrant children and youth with education:

- lack of basic competences
- high concentration in (certain districts of) Vienna
- problems with culture, violence, traditional values, etc.
- lack of support and awareness by parents
- problems aggravated by the pandemic.

The report also definitely individualises the problems to German language deficits and too little parents’ support, instead of analysing the slow reaction of schools to the challenges of diversity.¹ The model seems to be to make migrants to natives best during early education and latest through centralised high quality language and value courses controlled by the government.

The summer school might be discussed in relation to the needs of support. It provided 40 hours in relation to two months closed and two months halfway open schools, around 300 hours lost instruction, partly compensated by a mix of home schooling and distance schooling.² The target group was defined on basis of insufficient grades, and can be related to the numbers of pupils with insufficient competences based on PISA, projected to all pupils of compulsory schools (table 1). The defined target group was well below the numbers of needy children, maximum 60% if insufficient competences in all three domains are taken as benchmark, and the measure has reached between 15% and one third of pupils in need.

Table 1: Target group and participants of summer schools related to pupils at risk according to PISA

	Primary	Lower secondary (NMS)	Primary+MNS	Reached by summer school	Target group of summer school
Total	342 116	206 512	548 628	24000	42000
PISA'18 Risk all domains 13%	44 475	26 847	71 322	34%	59%
PISA'18 Risk Read 24%	82 108	49 563	131 671	18%	32%
PISA'18 Risk one domain 30%	102 635	61 954	164 588	15%	26%

Source: own compilation based on PISA results and Statistics Austria.

How much the provision has reached the pupils most in need is not visible in the available information.

In terms of quality the summer school is much emphasised by the ministry, however, an assessment does not exist so far. The summer school might have potential for innovation first by the proposed motivating project-oriented methodology, second by networking engaged persons from the involved groups if they can transfer into regular schooling, and third by taking up the old idea of the holidays as the time in which educational inequality rises between children that have support outside of school, and children that don’t have support.

¹ „Besorgniserregend ist etwa, dass zwei Drittel aller in Österreich eingeschulten Jugendlichen mit Migrationshintergrund nach acht Schuljahren nicht ausreichend Lesen, Schreiben und Rechnen können. Gründe dafür sind mangelnde Deutschkenntnisse und fehlende Unterstützung der Bildungskarrieren der Kinder durch ihre Eltern.“ (p.110, 2020 Integrationsbericht)

² ORF (14.08.2020) Kosten der Schulschließung <https://orf.at/stories/3177312/>; Agenda Austria (2020) Wie Homeschooling funktionieren kann. Policy Brief (August) <https://www.agenda-austria.at/wp-content/uploads/2020/08/aa-pb-homeschooling.pdf>

2.2 Measures in view of a second wave?

2.3 Forward looking measures tackling the challenges

The Austrian politics towards Corona are mainly dominated by health considerations, deliberately producing fear about hundred thousand cases of death. The population, and also the young people and the oppositional political parties accepted the lock-down measures almost totally and behaved very disciplined (see ANNEX 12.2.2). Education was given no priority during lock-down, and also during the recent steps towards normalisation education is ranked even after the economy, tourism, sports events, etc. The schools and the more than hundred thousand teachers were confronted with the decrees by the government from one day to the other, following the logic of the political taskforces monitoring the infection processes. The lock-down and shift to distance education was announced on Friday and had to be implemented over the weekend. The same occurred with the openings, schools and teachers had simply to comply the directives without much info in advance.¹

The issue of a second wave is mainly deliberated in terms of opening or closure of schools again, and measures of hygiene are in the foreground. Much administrative issues are tackled, a first issue was how to organise the maturity exam, other debates concern the practices of grading, etc.²

The info about distance learning concerns mainly administrative issues, due to the bureaucratic governance structure.³ Info about digital sources for distance education was given on the webpage of the ministry, however, how much account is taken, and how much the materials are utilised is open, statements by teachers doubt that the material reaches the clients (ANNEX 12.4).⁴ The regional education directorates also provide material for instruction.⁵ Providers of digital solutions have taken steps to popularise their products.⁶

A main issue of short-term forward looking measures concerns the compensation of the losses in learning through the lock-down by provision of learning opportunities during the summer.⁷ The ministry, regional directorates, and other organisations (e.g., employees chambers, trade union) have announced such initiatives.

2.4 Quality of the measures

Experts propose in the short run that a balance of health and learning issues should be considered in the process of opening up education institutions again.⁸

¹ See the info at the ministry webpage: <https://www.bmbwf.gv.at/Themen/schule/beratung/corona.html>

² <https://www.nachrichten.at/politik/innenpolitik/ab-10-uhr-live-so-sollen-die-schulen-wieder-geoeffnet-werden;art385,3253203>; <https://gemeindebund.at/oeffnung-der-schulen-startet-stufenweise/>

³ https://www.bmbwf.gv.at/Themen/schule/beratung/corona/corona_fua.html#a5

⁴ https://www.bmbwf.gv.at/Themen/schule/beratung/corona/corona_fl.html

⁵ E.g. the directorate of Vienna: <https://www.bildung-wien.gv.at/service/gesundheit-und-sport/Unterrichtsmaterialien.html>

⁶ https://www.ots.at/presseaussendung/OTS_20200408OTS0094/schule-in-corona-zeiten

⁷ https://www.bmbwf.gv.at/Themen/schule/beratung/corona/corona_fua.html#a2; https://www.meinbezirk.at/c-politik/schuloeffnung-mit-maskenpflicht-und-fuenf-kindern-pro-klasse-im-mai_a4038939; https://science.apa.at/rubrik/bildung/Ferienbetreuung-OeGB_draengt_auf_leistbare_Angebote/SCI_20200603_SCI1854885694; https://science.apa.at/site/bildung/detail?key=SCI_20200604_SCI1854905234; https://science.apa.at/rubrik/bildung/Stadt_Wien_verstaerkt_Lernfoerderung_in_den_Summer_City_Camps/SCI_20200524_SCI139411351854727732; https://science.apa.at/rubrik/bildung/Ferienbetreuung-Familienministerium_kuendigt_Leitfaden_an/SCI_20200603_SCI1854889140

⁸ <https://www.derstandard.at/story/2000117072174/ein-skript-fuer-die-rueckkehr-in-die-schulen>

The government programme includes several steps towards digitalisation, which have received much actuality through the shift towards distance education. However, it is not clear how the implementation of these plans will succeed. The master plan of the government so far makes progress dependent on the availability of resources. Statements by teachers from the practical level plea strongly for engagement in incremental bottom-up initiatives.¹ Provision of digital infrastructure is an important element, but does not suffice, direct support is necessary.²

The preliminary results of surveys show that disadvantaged pupils are not easily reached by policy measures. Teachers see 40% of pupils without the necessary support at home, on the other hand they were positively impressed by the engagement and achievement of 31% of their pupils. 70-80% see too little support of their activities at the school level, and by external professionals (ANNEX 12.2.1). The crisis is seen as a mirror and aggravation of political neglect of these groups also in normal times.³ The demand for shadow education by about one third of pupils in all sectors is a sign of this.⁴

2.5 Involvement of stakeholders

The policies have been devised mainly by the crisis task forces in cooperation with the government. Stakeholders have been involved to some extent, however, the involvement is not transparent.

The policies have been much criticized because of too little and too late information of the stakeholders. The teachers' representatives have made proposals of much smaller groups, and criticized the opening process as being too quick and lacking hygiene material, etc.⁵

3.0 A tentative quantitative picture based on a comparative ad-hoc survey

3.1 Schulbarometer-study, survey March/April 2020 in Germany, Austria, Switzerland

In the end of March/beginning of April 2020 a very quick survey in the context of school barometer has gathered information from the various stakeholders about their practices and conditions during the first time after the closing of schools in Austria, Germany, and Switzerland.⁶ Various material is available from this data.⁷ The survey included qualitative and quantitative data, and the focus was very much on pedagogical

¹ "Ich kann nur alle interessierten Lehrkräfte dazu ermutigen, sich für die Digitalisierung im Klassenzimmer stark zu machen und nicht darauf zu warten, bis es die Bundesregierung macht. Ja, es ist ein steiniger und mühsamer Weg, auf dem viele Hürden warten, mit denen man vorher nicht gerechnet hat." <https://www.schulgschichtn.com/digitaler-unterricht-nms-17032020/>; see also <https://www.schulgschichtn.com/digitaler-schultag-nms-07052019/>

² <https://www.derstandard.at/story/2000116842489/schulen-und-corona-laptops-reichen-nicht>

³ <https://www.schulgschichtn.com/schulbeginn-mai-26052020/>; <https://www.schulgschichtn.com/re-start-schulen-erfahrungsberichte-19052020/>

⁴ https://science.apa.at/rubrik/bildung/Jeder_dritte_Schueler_braucht_Nachhilfe/SCI_20200604_SCI854905158

⁵ https://www.meinbezirk.at/c-politik/schuloeffnung-mit-maskenpflicht-und-fuenf-kindern-pro-klasse-im-mai_a4038939; <https://www.vienna.at/schulen-in-oesterreich-oeffnen-wieder-so-wird-der-unterricht-ablaufen/6598137>

⁶ SchuBa Schul-Barometer für Deutschland, Österreich und die Schweiz des Instituts für Bildungsmanagement und Bildungsökonomie IBB der PH Zug und des World Education Leadership Symposium (WELS) <http://www.bildungsmanagement.net/Schulbarometer/medien/>

⁷ Huber, Stephan Gerhard; Helm, Christoph (2020) COVID-19 and schooling: evaluation, assessment and accountability in times of crises—reacting quickly to explore key issues for policy, practice and research with the school barometer. Educational Assessment, Evaluation and Accountability, published online 10 June <https://doi.org/10.1007/s11092-020-09322-y> <https://link.springer.com/content/pdf/10.1007/s11092-020-09322-y.pdf>

Huber, Stephan Gerhard; Günther, Paula Sophie; Schneider, Nadine; Helm, Christoph; Schwander, Marius; Schneider, Julia A.; Pruitt, Jane (2020) COVID-19 und aktuelle Herausforderungen in Schule und Bildung Erste Befunde des Schul-Barometers in

aspects, based on the combination of the sources; because of the quick mastering the data quality and representativity/comparability is difficult to value, at least some orders of magnitude are given as a first glance.¹

In the publications the database is only scarcely described. The overall number of respondents is around 7.000, students, parents, and teachers/staff each around 2.000, school leaders around 700, support personnel around 80 and administrators around 60. Proportions of the three countries are only reported for teachers/staff (leaders): Germany 42(44)%; Austria 45(34)%; Switzerland 13(22)%; Austria is highly overrepresented in these groups. Among students two thirds (68%) are over 15, more than half (55%) over 16 years old. Because the schools were a main gate-keeper for distributing the questionnaire, there might be some correlation or pooling between the respondent groups.²

To some part information per country is given; however, most information is based on the whole sample that is biased in multiple directions (the included groups are quite differently represented; Austrian staff is very strongly represented, for other groups this is not reported; among students the upper secondary level is strongly represented). Tab.1 gives some tentative orders of magnitude in the eyes of the surveyed groups about basic aspects of coping with the Covid-19 crisis, and using digital infrastructure and practices.

Information per country is given about the available technical infrastructure for web-based instruction/learning. In the view of the respondents, Austrian schools' infrastructure is very much better than in Germany, and slightly less good than in Switzerland: grossly, one third of Austrian schools are well equipped, one third is badly equipped, with the remaining third lying in between (in Switzerland the in-between group is larger, in Germany more than half of schools are badly equipped, and only eight per cent are well equipped. Another information concerns the use of online-platforms for communication and/or control by schools: here the proportion is about 40% in Germany, 60% in Austria, and 80% in Switzerland. The assessment/conclusions by the authors point to little use of the platforms:

„Es findet kaum institutionalisierte Live-Kommunikation zwischen Lehrern bzw. Lehrerinnen und Schülern sowie Schülern untereinander statt. / Es wird wenig Individualisierung und Differenzierung forciert. / Etwa ein Fünftel der Schülerinnen und Schüler gibt an, dass die Absprachen mit der Lehrerin und dem Lehrer nicht gut funktionieren.“ (Huber et al. 2020, 160)

In view of the parents 15% of households have insufficient IT-resources; only 8% of students see the lack of computers as a challenge. 50% of teachers/staff are positively motivated for digital practices; however, only 25% feel competent for that.

Deutschland, Österreich und der Schweiz. Münster: Waxmann doi: <https://doi.org/10.31244/9783830942160>
<https://www.waxmann.com/index.php?eID=download&buchnr=4216>

¹ "As the School Barometer was planned as a fast survey, and thus the instrument was developed in 1 week, data were collected over 2 weeks and the findings were disseminated as quickly as possible, the first report already after 1 week, the third report as open-access book publication after less than 3 weeks, some kind of communication strategy to reach out to all the different groups was needed. This approach reflects a constructive news contribution to support [...] in media to the public."(Huber, Helm 2020, 4)

² "A link to the questionnaire was sent via email to school leaders and school authority officials in Germany, Austria and Switzerland with a request to forward it to school staff, students and parents. Emails were also sent to teacher associations, school leadership associations and parent associations with requests to forward the link to the appropriate groups."(ibid., 10)

Table 2: Overview about some basic tentative orders of magnitude of main characteristics (% column)

Column percentages DATA, SAMPLE					TECH. RESOURCES at schools (teachers/staff response)		ONLINE PLATFORM schools yes
COUNTRY	Teachers/staff	Leaders	Parents	Students	Yes	no/few	
Germ	42	44			8	56	43
Austr	45	34			30	27	57-58
Switz	13	22	no info		24	19	81-82
ED.LEVEL					TEACHER COLLABORATION		
Early	5	12				(rather) no	yes
Prim	24	37	Prim+LowS	6-12y: 13	-mutual support	12	33
LowSec	35	32	37	13-15y: 32	-collab.school dev.	42	15
UpSec	21	12		16-20y: 55	-digital mat. dev.	53	12
Voc	11	5		(31)	-strategic discussion	16	16
Oth	5	4			STUDENTS' FEELING		
					bad 13	good 49	
REGION					STUDENTS' CHALLENGES		
Cities	55	46	57		(rather) no	yes	
Suburb	14	11			-learning	29	26
Country	31	43			-school arrangem.	27	25
					-plan day	39	19
STRESS					-no help parents	60	14
Yes	39	48	41	52	-no computer	78	8
No	22	20	23	17			
LACK INFO Policies					TIME RESOURCES		
	Teachers/staff	Leaders	Admin	Support	hrs.learn/week (day)	hrs/week%	(hrs/day%)*
	37	28	15	33	<4	7	
					5-9 (<2)	11	(18)
					10-14 (2-4)	15	(29)
					15-19 (4-5)	14	(22)
					20-24 (5+)	22	(31)
					25+	31	
PARENTS					HOURS		
household inadequate IT resources					HOURS/WEEK FOR		
					Mean	median	
Worries					-learning	17	20
Acceptance of restrictive measures					-digital activities	16	6
					-films/series	8	6
STUDENTS					-family/sport	9	7
Learning more than from normal teaching					-reading	4	2
					-total hrs.defined	54	41
TEACHERS/STAFF							
Feeling motivated for digital practice							
Feeling competent for digital practice							

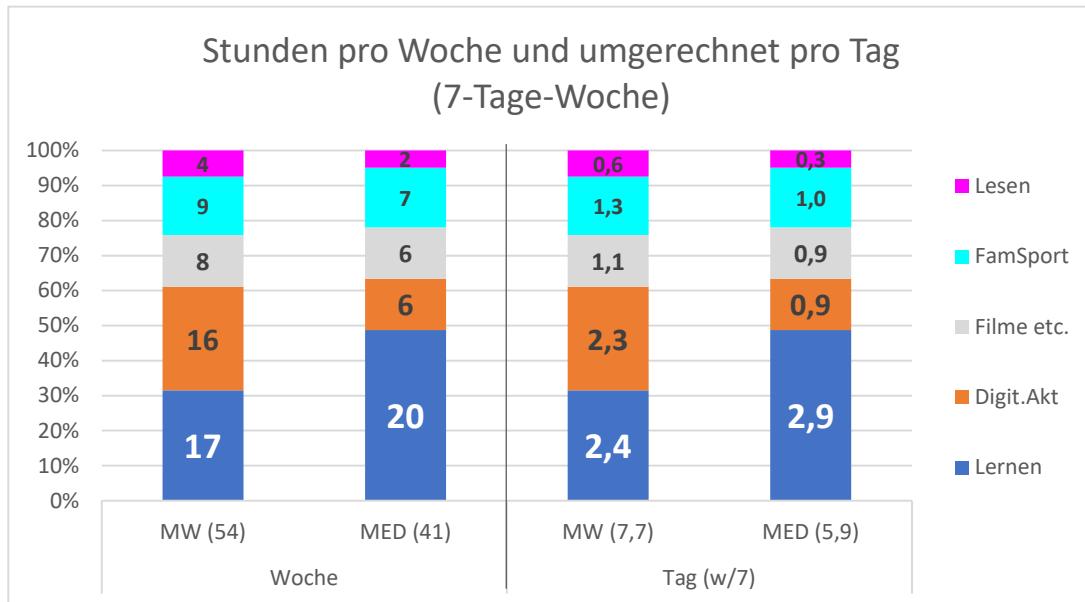
* five-days-week

Source: Own table derived from diverse Schulbarometer material

Some information from the total sample gives contextual impressions about how the involved groups have reacted to the crisis.

- Parents have accepted to 80% the restrictive measures, 33% have worries with the situation
- Students express to 49% quite good feelings with the situation, 13% have bad feelings; one fourth of students think they have learned more by distance learning. Main challenges are seen with learning (26%), arrangements with schools/teachers (25%), planning the day (19%) and lack of help by their parents (14%) – as stated above, only 8% of students see lack of computers as a challenge, On the positive side, 30%-to-60% of students see no challenges with these topics, even for 78% lack of computers is not perceived as a challenge.

Figure 1: Hours per week (day) reported by students (mean, median hours)



Source: Table 2, own figure and calculation based on Schulbarometer data

Fig.1 shows the reported hours per week (and re-calculated per day of a seven-day-week) by students. With learning and digital activities that consume together about 60% of reported activities the mean and the median differ, pointing to skewed distributions (in learning a substantial minority reports very few hours, in digital activities a substantial minority reports very high numbers). Reading is a very scarce activity (substantially less than one hour per day).

The distribution of learning hours (Tab.1) shows that students mostly devote less learning hours than (formally) included in a school week. The upper half reports more than 20 hours a week; recalculated to a five-days-week, more than 4 hours per day. On the other end, 18% report less than two hours a day.

Among teachers, collaboration is seen as key to coping with a crisis. Some information is included in the survey. The general item of mutual support is reported by one third of teachers (12% deny this item), the more specific items of cooperative development of digital material, collaborative school development, or strategic discussion as responses to the crisis are reported by smaller proportions of 12%-to-16% (concrete collaborative development work is denied by 40%-to-50% of respondents).

3.2 IHS-symposium 29.6-bis-1.7-2020, first results from surveys¹

3.2.1 Study Univ.Vienna

This study includes three waves of surveys (first phase of lockdown in early-mid April; medium phase end-April-begin-May; and during the re-opening period in June) among 10-to-19 years old pupils and among

¹ See the documentation at <https://www.ihs.ac.at/events/event-reviews/2020/leben-mit-corona/>; three presentations about learning and education are publicly available: Spiel, Christiane (2020) Covid 19 Herausforderungen für das Bildungssystem und die Bildungsforschung.

https://www.ihs.ac.at/fileadmin/public/2016_Files/Photos/Veranstaltungen/2020/Leben_mit_Corona/Praesentationen/05_Covid_19_Herausforderungen_fuer_das_Bildungssystem_und_die_Bildungsforschung.pdf; results from surveys pupils, students, teachers Univ.Vienna <https://lernencovid19.univie.ac.at/ergebnisse/>; Steiner, Mario; Köpping, Maria; Leitner, Andrea; Pessl, Gabriele (2020) COVID19 und Home Schooling. Folgt aus der Gesundheits nun auch eine Bildungskrise?

https://www.ihs.ac.at/fileadmin/public/2016_Files/Photos/Veranstaltungen/2020/Leben_mit_Corona/Praesentationen/S5_Steiner.pdf

students. Quite high numbers of respondents were reached particularly during the 1st and 2nd wave (around 8.000, then 11.000, then 2.500), among students the numbers were lower (2.500, 3.500, 1.600). An additional survey among teachers during the first half of May reached 1.800 respondents. The samples are not representative, in particular pupils without digital resources could not be reached, and females have responded much more frequently (more than 60% pupils, more than 70%-up-to-75% students). Respondents speaking another language than German amount to

Info about weekly learning times can be compared to the *Schulbarometer* study. Pupils respondents learned on average 5 hours per day during the early phase (50% rated 3,5-to-6-hours; 25% up to 3,5 hours; 1% 1 hour or less). These responses are on average higher than those in the Schulbarometer (depending on how many days are counted, the average per week would amount to 25-to-35 hours, compared to 17-to-20 hours in the Schulbarometer), in the Schulbarometer particularly the proportion of pupils with very few learning hours was much higher (18% less than 2 hours per day), whereas the middle group was lower (around 30% with 2-to-5-hours), and the proportion with higher learning hours was similar.

16% of pupil respondents lacked digital devices (computers, laptops, tablets), and 21% did not get needed support at home; teachers were in contrast highly reachable if needed (only 3% of pupils did not know how to reach their teacher), however, it is not clear how many pupils did not want/try to reach a teacher.

From pupils' responses the study identified a size of a risk group of 6%, that is extrapolated by the researchers to an absolute overall number of around 45.000 pupils in 10-to-19-years schools (NMS, AHS, vocational).¹ In the second wave a number of 70.000 pupils is extrapolated that have suffered a substantial decline of welfare since the early lock-down, 47.000 have reported that their learning has deteriorated.²

High proportions of pupils have missed school (in the second wave 32% very much plus 25% somehow, overall 57% missed school; 22% were neutral, and 21% did not miss school, thereof 12% not at all); however, every fifth pupil did not miss school during the lock-down. Early wakeup, stress and boredom during instruction, and exams are main factors not to miss school, the main factor to miss school are personal contacts with colleagues and teachers. With the partial reopening the wellbeing has improved for more than half of pupils in the third survey wave – this is consistent with the rate of missing school, and does not indicate overall happiness.

The students' surveys can be taken to some extent as a comparative counterfactual to the pupils' ones; they are a selected group of previously successful pupils, and more mature with more experience, and could be expected to cope better with the crisis conditions; more familiarity with digital resources could also be expected.

Average learning hours per week in the early phase of the lock-down are similar to pupils (25 hours on average), and have declined from 32 hours before the crisis (a reduction of more than 20%); 40% report the continuous management of fixed learning hours. 15% of students had severe problems with coping and

; Holtgrewe, Ursula; Lindorfer, Martina; Siller, Carmen; Vana, (2020) Lernen im Ausnahmezustand – Risiken und Chancen
https://www.ihs.ac.at/fileadmin/public/2016_Files/Photos/Veranstaltungen/2020/Leben_mit_Corona/Praesentationen/05_Leben-mit-Corona_IHS_ZSI.pdf

¹ In the reporting about the first pupils waves the authors formulate: „Etwa 7% der Befragten geben gröbere Probleme bei der Bewältigung der schulischen Anforderungen im Home-Learning an. Diese Gruppe zeichnet sich auch durch niedriges Wohlbefinden und geringe Zuversicht aus. Betroffene Schüler*innen fühlen sich mit ihnen wichtigen Personen weniger verbunden und halten weniger Kontakt mit ihren Freund*innen. Beim Lernen haben sie insbesondere Schwierigkeiten, ihr Lernen selbstständig zu organisieren.“ https://lernencovid19.univie.ac.at/fileadmin/user_upload/p_lernencovid19/Zwischenergebnisse_Schueler_innen.pdf

² According to the authors in their second wave report „...sind Schüler*innen, die angeben, dass sich ihre Lernsituation verschlechtert hat, tendenziell älter, erhalten weniger Unterstützung von zu Hause und geben eher an, auch vor der Corona-Krise Schwierigkeiten beim Lernen gehabt zu haben.“ https://lernencovid19.univie.ac.at/fileadmin/user_upload/p_lernencovid19/Zwischenbericht_Begfragung_2_SchuelerInnen.pdf

learning, in contrast to 7% that managed the situation very well; overall wellbeing was very low for 6% of students (10% very positive). The amount of very low wellbeing was the same among pupils and students, pupils were a bit more often overall positive than students (two thirds vs. 60%)

In the second wave the wellbeing has deteriorated for 35% and social contacts have worsened for 36% of student respondents, and 36% report that their achievement with tasks has worsened. The authors conclude that a large risk group exists of about one third of students.¹

Students subjectively miss the personal instruction much more often than pupils (49% vs. 32% very much, 20% vs. 25% somehow, 16% vs. 22% neutral, and 14% vs. 21% did not miss instruction, thereof 8% vs. 12% not at all). In the third wave students rated a perspective of continued home learning much in line with these results of missing the personal instruction (47% negative, 27% positive, 26% neutral). Wellbeing has deteriorated for a quarter of students still into the third survey.

The teachers survey in the first half of May observed that the majority could cope well with the lock-down, 9% reported more or less severe problems; a similar proportion of 9% reported that their personal digital infrastructure was not sufficient for the needs of instruction. A somewhat higher proportion of 16% of teachers were not confident that they can sufficiently instruct their pupils, and *almost two thirds (63%) did not expect that they can sufficiently instruct pupils with learning difficulties*.² Relations with their pupils were not positive for 7% of teachers, and 16% did not feel connected with their pupils. Positive and negative experiences of teachers indicate the increasing gap among pupils, on the one hand individual feedback, self-reliance and contacts to parents, on the other hand lack of support for weaker students, and increase of their problems.³

The questions and reporting about wellbeing are unfortunately not really comparable across the survey groups, the amount of very low well being seems similar among teachers to the pupils and students (5% vs. 6%), the positive responses seem lower among the teachers (40% vs. over 60%).

Most teachers have increased their competences with digital education (13% deny this), and they think they will use more digital devices also in the future during normal teaching (e.g., learning platforms: Moodle; communication tools: MS teams; supplies for exercising, ev. Flipped Classroom).⁴

¹ „Die Ergebnisse deuten auch darauf hin, dass es eine relativ große Risikogruppe gibt (etwas mehr als ein Drittel der Studierenden), deren Wohlbefinden und soziale Eingebundenheit sich über die Zeit des Home-Learning verschlechtert hat.“
https://lernencovid19.univie.ac.at/fileadmin/user_upload/p_lernencovid19/Studierende_Erste_Ergebnisse_Befragung_2_FINAL.pdf

² „Jedoch geben nur 7% an, zuversichtlich gewesen zu sein, auch Schüler*innen, die Probleme haben, den relevanten Stoff gut zu vermitteln (30,1% waren eher zuversichtlich, 44,9% waren weniger und 18% gar nicht zuversichtlich).“
https://lernencovid19.univie.ac.at/fileadmin/user_upload/p_lernencovid19/Erstergebnisse_Lehrpersonen.pdf

³ „Auf die Frage, was beim Unterrichten von zu Hause aus besonders gut gelungen ist, nennen zahlreiche Lehrpersonen die individuelle Betreuung der Schüler*innen durch persönliche Rückmeldung. Auch seien viele Schüler*innen deutlich selbstständiger geworden und die Zusammenarbeit mit den Eltern habe sich in vielen Fällen verbessert.“

„Auf die Frage, was beim Unterrichten von zu Hause aus besonders schwierig war, antworten viele Lehrer*innen, dass es schwierig sei einzuschätzen, wie viel Schüler*innen zu Hause schaffen. Ebenso bereite es Probleme, lernschwächere Schüler*innen und Schüler*innen mit schlechteren technischen Möglichkeiten ausreichend zu unterstützen. Probleme von ohnehin schon benachteiligten Schüler*innengruppen würden sich vergrößern.“
https://lernencovid19.univie.ac.at/fileadmin/user_upload/p_lernencovid19/Erstergebnisse_Lehrpersonen.pdf

⁴ „Auf die Frage, welche Formen des Unterrichtens von zu Hause sie auch künftig im gewohnten Unterricht in der Schule einsetzen möchten, wird der Einsatz digitaler Lernplattformen (z.B. Moodle) und Kommunikationstools (z.B. MS Teams) häufig genannt. Viele Befragte möchten auch künftig digitale Angebote bereitstellen, um selbstständiges Üben und Vertiefen von Lernstoff zu ermöglichen. Einige erwägen auch, entsprechend des Flipped Classroom Modells, Inputphasen aufzuzeichnen und Schüler*innen als Videos zur Verfügung zu stellen. Insgesamt beziehen sich viele Antworten darauf, selbstständiges Arbeiten durch digital unterstützte Plan- und Freiarbeit weiterhin fördern zu wollen.“
https://lernencovid19.univie.ac.at/fileadmin/user_upload/p_lernencovid19/Erstergebnisse_Lehrpersonen.pdf

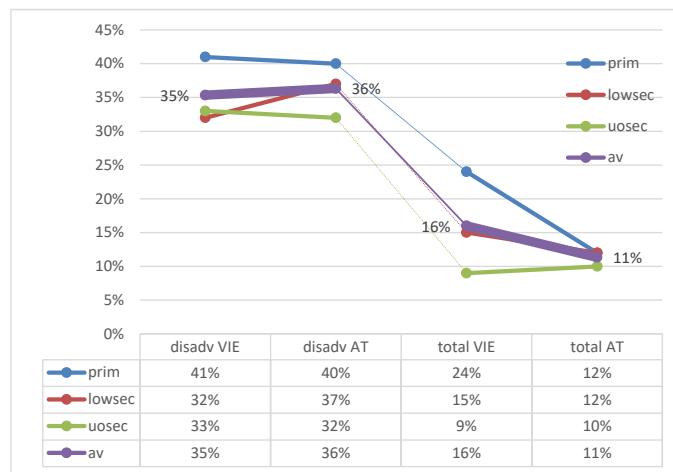
3.2.2 Study IHS

More results have been provided from the IHS-survey among teachers at secondary school, including some info about primary schools. The topics of this study concern instruction practice, teachers' impression about pupils, teachers' conditions, and consequences for competences and inequality (see ANNEX 14.2.1).

Instruction practice: Three aspects are reported, a reduction of cooperation among teachers at some factors, in particular in team-teaching, and a very strong reduction of professional support by social workers, youth coaching, psychologists, and external and internal support of learning (on average from almost 40% to 20%, at most supporting elements the reduction amounts to 20 percentage points), and some less appointments of digital sessions in AHS compared to NMS schools (in particular more chats and individual questions at NMS).

Teachers' impressions about pupils: First teachers reported indications of pupils that could not be reached, second about teachers' impressions of the difficulties of pupils. Figure 2 shows that among all pupils the proportion is similar at above 10% in the different school sectors, in Vienna this proportion differs (in primary school this proportion is higher at 25%, in lower secondary school at 16%, and in upper secondary school at the Austrian average). Among disadvantaged pupils this proportion is higher at one third (at Austrian average a bit higher in primary school (40%) and lower in upper secondary school; in Vienna the proportions are similar in primary and upper secondary school, but slightly below the Austrian average in lower secondary school.

Figure 2: Indications of pupils that could not be reached in the lock-down, all pupils and disadvantaged pupils, in Austria and in Vienna



Source: own figure, IHS-survey teachers

Among teachers' view of pupils' *difficulties*, the aspects of structuring the day, distraction, and lack of motivation were very highly prevalent (two thirds to 90% mentioning) in Austria and Vienna. More specific difficulties are mentioned a bit more frequently in Vienna: disturbed workspace and lack of support (both above 50% vs. below 40%) and around 40% technical problems with the lowest proportion of mentioned difficulties in Vienna.

Teachers' conditions: Main problems mentioned by teachers were high expenditure of time (above 80%), realistic amounts of tasks (above 60%), to reach pupils (below 60%), assessment (50%), distraction (25%).

Consequences of lock-down for competences and inequality: One fourth of teachers worried not to reach the years goals, at the same time 30% of pupils showed surprising achievements; 80% worried that the

achievement gap for disadvantaged pupils would rise. The gap between disadvantaged pupils and all pupils is underlined by a very high degree of expectations about loss of competences and overstrain of disadvantaged pupils and their parents by around 80%, as compared to 30%-to-60% among all pupils.

3.2.3 Study ZSI

This study is focused on digital learning and its social embeddedness, and looks at a sample of eleven schools from different sectors, and the involved groups of pupils, parents and teachers. Data from pupils, families, and teachers were reported.

The problems with fulfilling tasks amount to around 20%, with higher rates among low qualified background (35%) and single parents (29%), lower rates with both parents in home office (13%) and high qualified background (15-18%). The majority had not so much difficulties with tasks.

The parents reported positive and negative aspects of the lock-down.¹ Positive were emotional relief, self-determination, and free spaces; negative was motivation, structuring of days, overstrain, retreat. Recommendations by parents were more strategic digitalisation, support of self-reliance, alternative assessment, emphasis on social aspects, reflection of communication teachers-pupils.²

4.0 Lessons learnt from the crisis

Overall, policies were driven mainly by the dynamic of the pandemic, and the focus was on the health dimension. Learning in education has taken place to some extent at the practical level of schools and teachers, who had to cope with the political measures more or less without support.

To transform learning at the micro level into policy learning would need deliberate attempts and to reflect more systematically about the experiences made during this process, and to analyse them. Some research projects are under way, e.g. the surveys among pupils, or the survey among teachers, to analyse the impact of the crisis.

The digital strategy probably would also need some new analysis and update about the developments during the lock-down. A new financial development plan for the school infrastructure (Schulentwicklungsplan 2020) has been issued in March, that includes also some ideas about digital infrastructure, which seem quite general and vague (e.g., standardisation of devices).³

¹ „Erfahrungen der Eltern:

Positive Veränderungen: +Emotionale Entspannung/Entlastung: ‚Mein untergewichtiges Kind nimmt endlich wieder zu‘ // ‚Meine Kinder sind wieder annähernd so entspannt wie in der Zeit, als sie acht Jahre lang eine Alternativschule besuchten.‘ +Freude am selbstbestimmten Lernen +Mehr Freiraum für Kreatives, eigene Interessen, Familienzeit, etc.

Negative Veränderungen: -Abfallen der Lernmotivation, -Tagesstruktur schwer, -Gefühl der Überforderung, -Rückzug.

https://www.ihs.ac.at/fileadmin/public/2016_Files/Photos/Veranstaltungen/2020/Leben_mit_Corona/Praesentationen/05_Leben-mit-Corona_IHS_ZSI.pdf

² „Empfehlungen der Eltern:

- Digitalisierungsstrategie (Vereinheitlichung Tools, strategische Vorgehensweise, Schulungen, etc.)
- Selbstständigkeit gezielt fördern („Kinder wollen und tun ja eh“)
- Alternative Leistungsbewertung
- Soziale Räume und Beziehungen wichtig nehmen
- Kommunikation Lehrkraft Schüler*innen überdenken (Lerncoaching)

https://www.ihs.ac.at/fileadmin/public/2016_Files/Photos/Veranstaltungen/2020/Leben_mit_Corona/Praesentationen/05_Leben-mit-Corona_IHS_ZSI.pdf

³ <https://www.bmbwf.gv.at/dam/jcr:466fff77-3f83-4632-928c-b53c0b12c9c9/schep2020.pdf>

The authors of the Schulbarometer link in their conclusions the need for appropriate technical equipment with competence development and learning from experience:

"Potential implications for policy, practice and further research Schools must be provided with both financial and material resources to improve their technical equipment and personnel resources (by continuous professional development of staff to develop digital competences). Some state and federal initiatives related to this exist independent of COVID-19. However, certain administrative bureaucratic barriers do not allow easy access to these resources, even in crises like this. Thus, action is needed at all policy levels. [...] the exchange of experiences and know-how in digital teaching and learning must be supported by establishing platforms and initiating knowledge management systems. Through collaborative arrangements within schools, particularly within year and subject groups, approaches of coherent action for digital teaching and learning can be developed. Policy can support professional practice, and promising practices should be shared through human resource mechanisms." (Huber, Helm 2020, 15-16)

4.1 Innovation of teaching practice

There are signs that some boost of digital practices at the school and instruction level has taken place, mainly by extending and establishing digital communication platforms. The lack of infrastructure at home has turned out as a bottleneck.

The existing initiatives in teacher education, and the support structures of digitalisation should now be re-evaluated, and further developed based on the new experience. This should be part of the announced evaluation of the reform of teacher education.

There seems not much emphasis on digital practices and devices in early education, more systematic attention might be given to this topic.

The authors of the Schulbarometer survey conclude from their results about teachers and teaching:

"On average, school staff rated teachers' competencies related to the use of digital instructional formats as mediocre. When looking at country differences, Swiss and Austrian teachers seem to outperform German teachers. [...] A more interesting finding is that self-ratings of teachers' competencies are linked to technical resources at the schools. This suggests that teachers start to engage in digital teaching when appropriate technical resources are offered and teachers are more likely to claim to have appropriate technical equipment if they are competent in the use of digital instructional formats." (Huber, Helm 2020, 16)

4.2 Pupils digital competences

Some kind of digital divide has been uncovered in the processes of distance education. The figures, however, differ widely. In Vienna, at the lower secondary common school a figure of only 2% of pupils lacking devices has been published, in absolute figures about 3.500, that will be compensated by 5.000 laptops provided by the city through schools.¹ Other studies find much higher proportions, e.g. according

¹ <https://wien.orf.at/stories/3044088/>

to the IHS-survey 12% at lower secondary level could not be reached (ANNEX 14.2.1), another estimate has been at 7% of 6-14-years olds,¹ and the Univ.of Vienna study reports 16% of 10-19-years old do not have access to a laptop or tablet, and 21% do not have learning support (ANNEX 14.2.3).

Teachers also report on the other extreme, that almost one third of their pupils have surprised them by achievements above expectations.

Here also the existing measures should be re-evaluated and updated, given the experience through the lock-down.

4.3 Access to high quality education to all

Access to high quality education needs a quick development of measures for support of disadvantaged schools and pupils. Proposals to guide resources towards disadvantaged through social indexing and development programmes exist. The extension of integrated all-day-schooling is also proposed by oppositional parties as a key measure to improve access to high quality education for all.

4.4 Education and employment

The Corona crisis has uncovered the societal importance of certain occupational groups (e.g., in health, caring, and retail) who are in fact situated in low-pay and precarious working conditions, in caring they are mostly low-paid foreign workers (who have been discriminated by cutting social support measures some time ago). Here an improvement of conditions seems a main challenge, if this is done education will probably follow.

¹ <https://www.derstandard.at/story/2000116842489/schulen-und-corona-laptops-reichen-nicht>

PART II: Digitalisation background

5.0 Digital strategies and policies

5.1 Strategies and policies

Policies in school and higher education are separate. In ***school*** first steps were taken in the early 2000s, that were stepwise and incrementally extended until now. In 2010 an initiative e-fit 21 was established that included already many measures of today.

2017 a new overarching digitalisation initiative was established, and digitalisation in school was made a priority: Schule 4.0 Initiative, this strategy is under a relaunch currently towards a masterplan – somehow the process has been disturbed by the changes and crises in governments.¹

By the first programme **2010 e-fit 21** the following topics were addressed:

- learning platforms,
- tablets for mobile learning,
- networks of certified schools at the various levels,
- digikomp8 from 2013/14,
- digital school books,
- wireless infrastructure,
- virtual teacher training (PH),
- MOOC projects in upper secondary education

These topics were regrouped and amended in the following steps.

In **Schule 4.0. 2017** the following main topics arise, with the integration in curricula as a new step:

- digital basics in primary and lower secondary education (content curricula);
- competent pedagogues;
- infrastructure and IT-provision;
- digital learning tools

The **masterplan 2018-19** regrouped the same topics to three broader action fields

- software (pedagogy, content)
- hardware (infrastructure, IT-management, administration)
- teachers (initial and continuing education)

In **higher education** the focus is on the preparation for STEM/MINT qualifications, in particular in the Fachhochschule sector, in the university sector the strategy is to include digitalization in a broad sense in the negotiation of the performance agreements (professor positions, new study programmes and profiles);

¹ Recent presentations are available that give an overview about the activities.

Digitale Bildung in Österreich. Strategien und Konzepte zur Vermittlung digitaler Kompetenzen in der Schule. Martin Bauer, BMBWF, Abteilung Präs /15 IT Didaktik, Innsbruck, 23.11.2018

https://www.uibk.ac.at/fakultaeten/lehrerinnenbildung/aktuelles/2018/images/2018/2018-11-23_digitalbildungnoesterreich.pdf

Schwerpunkte zur Digitalisierung und Digitalen Bildung. Gruppenleiterin Mag. Heidrun Strohmeyer, CDO im BMBWF, Linz, 12.3.2019, pres https://eeducation.at/fileadmin/user_upload/Folien_Strohmeyer_Digitalisierung_BMBWF.pptx, see also text overview <https://eeducation.at/index.php?id=643>

until 2021 each university is required to present a digitalization strategy (Hochschule 4.0).¹ Recently a EURO 50 million tender has been published complementary to the performance agreements for the universities to propose development projects in digitalization, combined with the social inclusion agenda.²

In parallel an initiative towards **industry 4.0** also includes a working group about qualification and competence that has made some general recommendations in 2017 that cover the different stages and sectors of education along the lifelong learning cycle, including adult and in-service enterprise education.³

Summary of main measures/topics developed, implemented, or charged in the school sector are the following

- IT infrastructure, including plans and charges for free tablets or laptops for pupils (see overview ANNEX 15.3)⁴
- development of conceptual and practical material concerning the various digital competences⁵
- creation of school networks active in digitalization, awarding good practice activities
- a subject-curriculum at lower secondary level (grade 5-8, four hours at four grades) about digital basic competences, however, “flexible” provision by schools also within other subjects possible⁶
- activities in teacher education, virtual PH (competency model, and self-assessment tool)⁷
- digital learning material, digital administration⁸
- support of bottom-up activities and of some broader projects: support of digital thinking in compulsory education,⁹ mobile learning,¹⁰ collaborative education (EU-project)¹¹

The masterplan was announced by the government in autumn 2018, should be presented in autumn 2019, however, the whole document still cannot be found. Implementation is announced for the period till 2023.

In higher education the current period of performance agreements is 2019-21, institutional strategies must be presented till the end of this period (2021).

¹ See overview <https://www.bmbwf.gv.at/Themen/Hochschule-und-Universit%C3%A4t/Hochschulgovernance/Leitthemen/Digitalisierung.html>

² Tender: https://unicontrolling.bmbwf.gv.at/index.php?option=com_content&view=article&id=36&Itemid=157; Erwartungspapier June 2019: https://unicontrolling.bmbwf.gv.at/images/wftender/Erwartungspapier_Digitalisierung_FINAL.pdf; this tender is not meant as a strategy, however, has expressively strategic purposes.

³ <https://plattformindustrie40.at/qualifikationen-kompetenzen-fuer-industrie-4-0-2/>; Strategy paper about qualifications Ergebnispapier (2017) “Qualifikationen und Kompetenzen in der Industrie 4.0”.

⁴ Overview <https://www.bmbwf.gv.at/Themen/schule/zrp/dibi/itinf.html>

⁵ Kompetenzmodell digi.comp, overview <https://www.bmbwf.gv.at/Themen/schule/zrp/dibi/dgb/digikomp.html>; concrete models for grade levels 4-8-12 digi.komp4, digi.komp8, digi.komp12, and teachers digi.kompP <https://www.digikomp.at/>

⁶ Digitale Grundbildung <https://www.bmbwf.gv.at/Themen/schule/zrp/dibi/dgb.html>

⁷ Digikomp.P <https://digikomp.at/?id=592>; self assessment digicheck <https://community.eeducation.at/digicheck/#launch>; engl.virtual PH <https://www.virtuelle-ph.at/ueber-uns/onlinecampus-virtuelle-ph/information-in-englisch/>; digi.folio provides a tailor-made continuing education programme <https://www.digifolio.at/>

⁸ See https://www.uibk.ac.at/fakultaeten/lehrerinnenbildung/aktuelles/2018/images/2018/2018-11-23_digitalbildungnoesterreich.pdf; books amended by digital material, rollout planned from 2019-20, several software packages are available for administration <https://www.bmbwf.gv.at/Themen/schule/zrp/dibi/itinf/ndts.html> Schülerverwaltungssoftware („Sokrates Bund“, Einsatz an Bundeschulen verpflichtend), Digitales Dienstpostsystem („ISO-Web“, Kommunikationssystem für Bundeschulen mit übergeordneten Dienststellen), Bewerbungsverwaltung („Get your teacher“, Bewerbungstool für Schulen und Jungpädagog/innen), Unterrichtsinformationssystem („GP UNTIS“), Unterrichtspersonalsystem („PM UPIS“), Dienst-E-Mail für Lehrende (bildung.gv.at).

⁹ DLPL Denken lernen, Probleme lösen and EIS Education Innovation Studios <https://www.bmbwf.gv.at/Themen/schule/zrp/dibi/dgb/dlpl.html>

¹⁰ Mobile Learning - Tablets im Unterricht einsetzen <https://www.bmbwf.gv.at/Themen/schule/zrp/dibi/inipro/mobilelearning.html>

¹¹ Collaborative Education Lab <http://colab.eun.org/home>

The 2011 government's **lifelong learning strategy** till 2020 (LLL:2020) did not include digitalisation at all (not even the expression occurs in a text search); given the huge dimension of this strategy, and the involvement of so many stakeholders, this might reflect the priorities at these times.¹

Two analyses of digital education have been published in the national education reports (NBB) 2015 (media competence) and 2018 (digitalisation).²

The 2015 analysis has criticised the scattered bottom-up initiatives and activities that had in sum reached only a very small fraction of schools (4% overall). Moreover, in qualitative terms a bias towards technical and hardware tools vs. pedagogical approaches was observed. The eEducation initiative was a reaction to this.

The 2018 contribution has analysed the eEducation initiative that has organised and systematised the previous initiatives in a national network. The involvement of schools has been substantially extended. A gamification approach has been established that identified expert schools by the award of badges based on 34 potential activities that can be taken by schools. The assessment of a certain number of activities (badges) allows schools to gain expert status (which are also often classified as active schools in digitalisation activities); if schools with expert status are taken as equivalent to the previously active schools the involvement has quadrupled with the new initiative. The gamification approach has been criticised also for only two levels (members and experts), and for partly problematic definitions of activities.

The masterplan 2018-19 might also include an evaluation of past activities; however, no formal document can be found of the masterplan, some presentations give comprehensive overviews about structure and topics.³ Because of the changes in government, it is not clear at the moment whether future evaluations are planned (see overview in ANNEX 15.4).

Lively discourses about the exchange of practice in the school sector are going on during recent years at the eEducation Competence Center,⁴ The Future of Higher Education process 2016-18 included the topic of digitalisation by "Informatik" as a specific topic.⁵

For the development of the masterplan an expert group has been established; the future is not transparent at the moment. The industry 4.0 initiative includes a standing expert group for qualification and competences, their actual agenda is not publicly available.

There is no national agency in place for monitoring digitalisation in education. Expertise is rather emerging from bottom-up via the practical approaches taken during the recent decades, comprised by e.g., some officials in the ministry who are participating in European projects and networks,⁶ several units in the teacher education colleges (PHs Pädagogische Hochschule), e.g. the E-Learning-Strategiegruppe der

¹ <https://www.qualificationregister.at/wp-content/uploads/2018/11/Strategie1.pdf>

² Medienkompetenz fördern – Lehren und Lernen im digitalen Zeitalter (2015) Peter Baumgartner, Gerhard Brandhofer, Martin Ebner, Petra Gradinger & Martin Korte, NBB 2015 Vol.2 https://www.bifie.at/wp-content/uploads/2017/05/NBB_2015_Band2_v1_final_WEB.pdf

Bildung im Zeitalter der Digitalisierung (2018) Gerhard Brandhofer, Peter Baumgartner, Martin Ebner, Nina Köberer, Christine Trützsch-Wijnen & Christian Wiesner, NBB 2018 Vol.2 https://www.bifie.at/wp-content/uploads/2019/03/NBB_2018_Band2_final.pdf

³ The public story brought forward by officials from the ministry is that the chancellor Kurz was inspired at a travel to Hongkong about the necessity of a digitalization strategy, see ANNEX 13.1

⁴ See the documentation of the yearly conferences 2017-19 at <https://eeducation.at/index.php?id=21&L=0>

⁵ See https://uniko.ac.at/wissenswertes/uniko_pedia/eu/governance/index.php?ID=14554#O14554; overview <https://www.bmbwf.gv.at/Themen/Hochschule-und-Universit%C3%A4t/Hochschulgovernance/Steuerungsinstrumente/Zukunft-der-Hochschule.html>; report Informatik https://www.bmbwf.gv.at/dam/jcr:3a6d114f-d96e-4e36-a7e8-6e14de2bf864/AF_3_Informatik.pdf

⁶ See <https://www.bmbwf.gv.at/Themen/schule/zrp/dibi/inipro.html>

österreichischen Pädagogischen Hochschulen (PHELS),¹ the people organising the e-Education platform,² and several initiatives in universities (partly related to teacher education), e.g. the Forum Neue Medien in der Lehre Austria (FNMA).³

Box 1: Development of policies for digitalisation in education⁴

- 2010: **ICT strategy ‘e-fit21’**: ICT education and training at schools is supported by the Ministry of Education by diverse initiatives. The main measure is the initiative e-fit21 ('Digitale Agenda für Bildung')⁵, which was developed in 2010 as national ICT strategy for education and aims to provide pupils with high quality ICT competences. For example, in order to support the establishment of new learning platforms at schools, the ministry offers shared services, such as platforms, content portals and open software products.⁶ The Ministry of Education together with the Ministry for Transport, Innovation and Technology have initiated the project 'Mobile Learning' (as part of the strategy 'efit21') to support schools in the introduction of new technologies. 94 schools of 31 regional clusters are participating in the project and will receive 2,000 tablets in the school year 2015/16.⁷
- E-learning: One part of e-fit21 is **eEducation** which includes the projects eLSA and eLC. eLSA (eLearning im SchulAlltag) is a network of 150 certified schools integrating e-learning and blended learning in all subjects. The eLSA project is coordinated by e-learning coordinators at regional and school level.⁸ The eLC 2.0 (eLearning Cluster Project) is another initiative of the Ministry of Education, with a focus to implement e-learning on a practical level at upper secondary schools and colleges.
- Guidelines for **gender-sensitive use of ICT**: The Ministry for Education developed guidelines for gender-sensitive use of ICT in classroom teaching and in teacher training to enable more gender equality within the use of new technologies.⁹
- 2013/14: Development and implementation of the **competence model ‘digital competences’**: A reference framework for digital competences to be achieved by the 4th, 8th, 9th and 12th grade of general education was developed. Digital instruction units and examples to be used in instruction were also developed and tested in pilot schools. In the ‘new secondary schools’, for example, the model ‘Digikomp8’ was introduced in the school year 2013/14.
- 2016/17 **Digital school books**: The Minister of Education (in cooperation with the Minister of Family and Youth) have planned to introduce digital school books with the school year 2016/17. They can be used on a voluntary basis in addition to traditional teaching material.¹⁰
- **Wireless Internet**: reform plans have aimed at installing wireless internet at all Austrian schools until 2020.¹¹

¹ PH strategy group <http://www.phels.at/>; in addition PH Niederösterreich is represented in the leadership of the Form Neue Medien (see below) and also provides an online journal with contributions about digital education since 2014 <https://journal.ph-noe.ac.at/index.php/resource/uebersicht> (23 hits for keyword digital); a key evaluation study about mobile learning was delivered by a cooperation of 4 centers at the PH Vienna (Zentrum für Lerntechnologie und Innovation ZLI, Institut für weiterführende Qualifikationen und Bildungscooperationen IWQ, Zentraler Informatikdienst ZID, Zentrum für Schulentwicklungsberatung ZSB).

² See engl.overview <https://eeducation.at/index.php?id=81&L=1>; see info about the platform community <https://community.eeducation.at/course/index.php?categoryid=2>; we find 16 persons in the competence center, 8 project group networks with 3 to 12 persons responsible, and 6 regional communities by Länder; diverse partners are documented, including educational institutions, regional administrations, private players, and some big companies (IBM, Samsung, SAP).

³ See <https://www.fnma.at/>; “das einzige landesweite und hochschulübergreifende E-Learning-Netzwerk im deutschsprachigen Raum” (webpage, überuns), members ar the HE institutions represented by delegates, individual memberships are also possible, several topics have been addressed by the network through projects, conferences, or (open source) publications. E.g. in 2016 an overview about the state of e-learning was published <https://www.fnma.at/content/download/1431/4895>

⁴ The e-learning initiatives of the Ministry of Education are also critically discussed; referring to, for example, to the lack of information regarding costs or control mechanisms and to the profit of companies through the introduction of new technologies in schools. Kaiser-Müller, Katharina (2015) Ideologiekritik des E-Learnings, <https://journals.univie.ac.at/index.php/mp/article/view/mi773/924>

However, the OECD (2015) report ‘Students, Computers and Learning: Making the Connection’ confirms the e-learning initiatives of the Ministry of Education seem to be successful. For example, in Austria, the rate of 2.9 pupils per computer is above the OECD average of 4.7% and also the use of electronic media is higher than the OECD average. The report also stresses the important role of teachers in the development of ICT competences.

OECD (2015) Students, Computers and Learning: Making the Connection, PISA, OECD Publishing. <http://dx.doi.org/10.1787/9789264239555-en> <https://www.oecd-ilibrary.org/docserver/9789264239555-en.pdf?expires=1592767207&id=id&accname=guest&checksum=9366F2EA692AD9A5B7FSDE1809649644>

⁵ BMBF (n.a.) E-fit 21. <http://www.efit21.at/uber-efit21> [orig.source changed]

⁶ BMBF (n.a.) E-fit 21. Lernplattformen – zentrale shared Services. <http://www.efit21.at/handlungsfelder/bildung-qualitaet/lernplattformen-%E2%80%93-zentrale-shared-services> [orig.source changed]

⁷ BMBF (24.09.2015) BMBF und BMVIT investieren mehr als eine Million Euro in „Mobile Learning“. <https://www.bmbf.gv.at/ministerium/vp/2015/20150924.html> [source removed]

⁸ BMBF (n.a.): eLSA. <http://elsa20.schule.at/>

⁹ BMBF (n.a.): Websites im schulischen Bereich. Anregungen für eine gendersensible Gestaltung. https://www.bmbf.gv.at/schulen/unterricht/ba/gendersensible_gestaltung_vo_18527.pdf?4dzqm2 [source removed]

¹⁰ BMBF (15.09.2015) OECD-Bericht bestätigt erfolgreichen Einsatz digitaler Medien an Österreichs Schulen. <https://www.bmbf.gv.at/ministerium/vp/2015/20150915.html> [source removed]

¹¹ BMWFW, BMBF (2015): Bildungsreformkommission. Vortrag an den Ministerrat. <https://www.bmbf.gv.at/ministerium/vp/2015/20151117.html> [source removed]

- **ICT training for teachers:** Further teacher training to ensure ICT skills is provided by the initiative 'Virtuelle PH' (virtual university of teacher training). The virtual university provides online seminars for teachers.¹ Teachers can achieve a certificate for professional and integrative ICT in teaching by an EPICT (European Pedagogical ICT Licence) training course.²
- Preparation of a Massive Open Online Course (**MOOC**) for ICT education: In order to test the use of MOOCs in schools, a MOOC for the subject 'ICT' in the first grade of academic upper secondary education is currently being developed.³
- 2017 A new **digital strategy of the government**⁴ has covered education as well as research and innovation and proposed sets of measures in various fields.
- Related to the roadmap a **strategy Schule 4.0** has been started in autumn 2017⁵ that still provides the main activities for digitalization. A support infrastructure has been developed and a network of schools exists that is used for implementation. Its pillars were (i) provision and assessment of digital basics in primary and lower secondary education, (ii) competent pedagogues, (iii) infrastructure and IT-provision, (iv) digital learning tools (see ANNEX 15.14 for a more detailed overview of this strategy). In this course of activities an inventory of digital resources 2016 has also been published in 2017 (see ANNEX 14.1) and section below.
- 2018: The **new government programme**⁶ has announced fundamental changes in education,⁷ but did not place much concrete emphasis on digitalisation in its Bildung section. A general paragraph is included in the introductory part,⁸ (i) digitale Lernunterstützung should be one of the main topics of further education of teachers (p.61); (ii) equipment for all schools with digital infrastructure should be one of the priorities of the common development plan of school infrastructure (p.63); (iii) digital instruments should be used for governance and assessment (p.63); (iv) in the content of curricula, digital basic competences and knowledge and competences in STEM/MINT should be strengthened (p.65); (v) more emphasis to digitalisation is given in the section about VET (p.66-67), in particular programmes in this sector should be developed and increased. In the section on digitalization the following points concerning schools are mentioned (p.83): (vi) broadband equipment for educational institutions; (vii) Digitalisierungsoffensive in education, including basic competences in all schools; considering in pre-primary education introducing programming from 1st grade (e.g. Scratch); competences for pedagogues; digital apprenticeship occupations.
- 2019: New **Masterplan** announced. Should be developed by summer 2019, and implemented by 2023.⁹ It includes five goals (innovative pedagogy and curricula, age specific digital competences/knowledge and critical reflection, increase of interest particularly among girls, digital skills, competences, knowledge for the labour market, support of creative potential and talent)¹⁰ that should be implemented through three action fields (software, hardware, teachers).¹¹

¹ Pädagogische Hochschule Burgenland (n.a.): Virtuelle PH. <http://www.virtuelle-ph.at/>

² www.epict.at

³ ARGE-Informatik AHS Austria (2014) IMST Fachdidaktiktag 2014. <http://www.ahs-informatik.com/veranstaltungen/fachdidaktiktag-2014/>

⁴ 120 Bundeskanzleramt und Bundesministerium für Wissenschaft, Forschung und Wirtschaft (2016) Digital Roadmap Austria. Die digitale Strategie der österreichischen Bundesregierung (Dezember) https://www.digitalroadmap.gv.at/fileadmin/downloads/digital_road_map_broschuere.pdf; Internet-Version <https://www.digitalroadmap.gv.at/>

Main topics and measures on education were (i) to provide basic (general) competences at school from early years, and specific competences for employability and vocational use (specialists in STEM-MINT-subjects), including data security and internet safety, (ii) to provide equal access to infrastructure and learning material, to use IT for pedagogy and build digital competences among teachers, (iii) to provide easy internet use in higher education for teaching and publication, improving open access, and to use digital technologies for better access to adult and further education.

⁵ BMBWF (6.4.2018, online) Schule 4.0. – jetzt wird's digital <https://bildung.bmbwf.gv.at/schulen/schule40/index.html> (source changed, this strategy has been meanwhile removed from the ministry's webpage)

⁶ The proposals take up to some part the previous strategies and extends them. However, a difference seems to be that a more instrumental and economising approach is taken (behind the lines), whereas the previous government has put more emphasis also on the development of critical media competence, and embedding digital skills into this broader framework.

For a description and assessment of the government programme see <http://www.equi.at/dateien/bxl-austria-edpol-pdf.pdf>; <http://www.equi.at/dateien/rp-2017.pdf>

⁷ Government programme 2017-22

https://www.fpoe.at/fileadmin/user_upload/www.fpoe.at/dokumente/2017/Zusammen_Fuer_Oesterreich_Regierungsprogramm.pdf

⁸ 59 „Österreich fit für die Herausforderungen der Digitalisierung machen“ (p.58)

⁹ Website access <https://www.bmbwf.gv.at/Themen/schule/zrp/dibi/mp.html>; download document https://www.bmbwf.gv.at/dam/icr:dbc3a630-8034-47aa-9e9d-4db35e58867c/masterplan_digitalisierung_pi.pdf

¹⁰ 37 Goals:

-Innovation in Methodik und Didaktik durch pädagogisch versierte Nutzung der digitalen Möglichkeiten im Unterricht.

-Altersadäquate Förderung der digitalen Kompetenzen und Wissen sowie kritische Bewusstseinsbildung in allen Schularten und Schulstufen entlang klarer pädagogischer Leitlinien.

-Steigerung des Interesses an Technologie und Technologieentwicklung, insbesondere unter Mädchen.

-Verlässliche Vermittlung der digitalen Fertigkeiten, Kompetenzen und Wissen, die für einen erfolgreichen Übertritt in den Arbeitsmarkt erforderlich sind.

-Förderung der mit der Digitalisierung verbundenen kreativen Potenziale unter den Schülerinnen und Schülern sowie Stärkung von Talenten.

¹¹ 38 Handlungsfeld 1 „Software“ - Pädagogik, Lehr- und Lerninhalte; Handlungsfeld 2 „Hardware“ - Infrastruktur, modernes IT-Management, moderne Schulverwaltung; Handlungsfeld 3 „Lehrende“ - Aus-, Fort-, und Weiterbildung: Digitalisierung.

HIGHER EDUCATION

- 2013: E-learning and blended learning: The performance agreements between the responsible ministry and universities for 2013-2015 emphasise the use of new media, e-learning and blended learning.¹ OER are rarely used; information published at learning platforms are usually only available for students of the respective course. The recently published results of a survey at one university suggests that students ask for more e-learning possibilities and consider e-learning as clear part of quality characteristics of a higher education institution.²
- MOOC: The development and use of MOOCs is currently being tested – for example at the Technical University Graz (<http://www.imoox.at/wbtmaster/startseite>).
- 2018 In the sections about Wissenschaft and Innovation/Digitalisation more emphasis is given to digitalisation. Higher education should be a kind of vanguard for the digitalisation of the public sector. In this vain the following points are made: (i) extension of the FH sector towards STEM/MINT, and increase of STEM/MINT studies and content in existing studies at universities (p.72); (ii) digitalisation of higher education administration (p.73); (iii) generally pushing digitalisation in HEIs (Big Data, Open Access, digital networking of institutions, study programme 4.0, e-learning) (p.73). In the section on digitalization adult further education is mentioned by (iv) digital academy in lifelong learning and adult education; (v) enterprise-based digital further education; and (vi) edTech cluster for technologies concerns all sectors.

Source: See footnotes

5.1.1 Digital infrastructure 2016 (ANNEX 14.1)

In 2017 the ministry has provided a survey of the state of digital infrastructure in Austria.³ The networking of digitally engaging schools is complemented by a digital quality award (Gütesiegel) which is also documented on the internet.⁴ We can document the distributions and also relate descriptively the infrastructure to the awards (ANNEX 14.1).

The measures document the access of pupils to
-IT-infrastructure,
-availability of WLAN, and
-transfer-rate.

The regional differences are high, and central level schools (which are much lower in numbers) have some more infrastructure (about 10 pct.points, except the transfer-rate) than regional level (compulsory) schools; correlation between governance levels is low.

On average between less than one fifth (transfer-rate) and one third to half of schools (WLAN) have more fully developed IT-infrastructure.

In secondary schools IT-infrastructure is somewhat more developed than in primary schools, and also VET schools have more IT infrastructure than AHS.

The awards give some indication about the engagement of school in digitalisation, and the overall figures are still low: totally about 4% of school own the award, with quite big differences between compulsory (PRIM less than 1%; SEC about 3%) and upper level schools (8% of AHS, and 5% to 15% of VET non-technical or technical schools).

¹ BMWFW (n.a.) Leistungsvereinbarungen 2013-2015. <http://wissenschaft.bmwf.at/bmwf/studium/studieren-in-oesterreich/oesterr-hochschulwesen/das-oesterreichische-hochschulsystem/leistungsvereinbarungen-2013-2015/> [source changed]

² Ebner, Martin; Köpf, Elly; Muuß-Merholz, Jöran; Schön, Martin; Schön, Sandra; Weichert, Nils (2015) Ist-Analyse zu freien Bildungsmaterialien (OER) Die Situation von freien Bildungsmaterialien (OER) in Deutschland in den Bildungsbereichen Schule, Hochschule, berufliche Bildung und Weiterbildung im Juni 2015, o.O. (online): Wikimedia Deutschland e. V. <https://I3t.eu/oer/images/band10.pdf>

³ BMB (2017) IKT-Infrastrukturerhebung 2016. Internetanbindung und Internetnutzung an österreichischen Schulen. https://bildung.bmwf.at/schulen/schule40/ikt_infrastruktur_2016_laender.pdf?61edz0 (source changed > <https://www.bmwf.at/Themen/schule/zrp/dibi/itinf/iktie.html>)

⁴ Web-documentation of digitalisation award (Gütesiegel) <http://www.mintschule.at/mint-landkarte/>

There is quite big variation in engagement between regions, with a range between 8% of total schools with awards in Vienna and 1% in Vorarlberg; if the sectoral participation is considered, this is rather even across sectors in Vienna, but shows high engagement in technical VET in Styria, Carinthia and Upper Austria.

The infrastructure is not correlated to engagement.

The current preliminary document of the masterplan includes some updated information about resources in 2018:¹

- 6% of NMS (common lower secondary school) and 6% of AHS (academic secondary schools), and 15% of BMHS (vocational schools) provide classes that work more systematically with notebooks or tablets (called notebook-classes)
- Some work (if needed, „bei Bedarf“) with pupils' own devices (Smartphones, Tablets, Notebooks) takes place during class at grossly two thirds of NMS, AHS und BMHS
- 46% of NMS, 51% of AHS, and 60% of BMHS provide WLAN in all rooms (in 2016 these figures were about 10pct.points less)
- Internet broadband-downstream connection with 40 Mbit/s (100 Mbit/s) have 41% (14%) of NMS, 37% (35%) of AHS, and 43% (39%) of BMHS (the 100 Mbit/s connections in 2016 were at about 10% in AHS and BMHS, and below 20% in NMS)
- 66% of NMS, 59% of AHS, and 50% of BMHS have developed a pedagogic concept for supporting use of digital technology.

Compared to the availability of good infrastructure much more schools have pedagogical concepts for the use of this infrastructure.

5.2 Current strengths and weaknesses

It is not easy to identify particular strengths, a quite wide range of initiatives exists since the early 2000s, that have grossly provided for an average position of Austria and Austrian education in many aspects; in some aspects Austria is ranking behind, in no aspect very good. Infrastructure is to some extent better developed than practices, young peoples' competences are developed to some degree by informal learning.

A strength might be a strong conceptual emphasis on critical media competence, however, its realisation is not so clear.

A mixed picture arises from the available information. On the one hand a broad array of activities has emerged since the 2000s, that have been to some extent systematised and brought together in the eEducation competence centre. Strategic impulses have been given in 2017 and relaunched in 2018-19, however, there is no clear evidence of whether these (rhetorical and programmatic) impulses have really given a strong impetus for practical activities.

The existing initiatives may seem large from the point of view of the people directly involved (often around 100 schools), however, in relation to the overall system they are quite small, with around one fifth of schools

¹ Available document https://www.bmbwf.gv.at/dam/jcr:dbc3a630-8034-47aa-9e9d-4db35e58867c/masterplan_digitalisierung_pi.pdf

being actively involved in the initiatives to a higher degree (see ANNEX 15.2 for an overview about the networks in eEducation).

The political turbulences and changes in government might also have retarded the development to some extent. Maybe, when the masterplan is developed and put into practice, more impetus will arise. However, the expressions in the presentation already relativize this by pointing to the resource needs, that might be too high in relation to the prevailing fiscal austerity. The new financial situation according to the Covid-19 measures will aggravate this issue.

6.0 Broader policies and state of digitalisation: some comparative information

6.1 Scenarios of education and digitalisation

In a Study about the positon of education in scenarios of digitalisation Lassnigg, Bock-Schappelwein (2019)¹ have analysed the policy attempts to address this issue. We have shown that the topic was addressed in the mid-2010s in a quite narrow approach, taking solely the Industry 4.0 or internet of things scenario into account that considers how the existing big industrial firms use the tools of communication between machines (to some extent the focus was also in Germany laid on this aspect).

Other approaches of how digitalisation has created completely new industries, e.g. the platform economy, but these have been more or less neglected in this first phase. Based on a literature review we have identified seven scenarios of how digitalisation might affect work and employment in addition to the Industry 4.0 scenario, and that might have different impact on education demands and supply: two related to growth economics ("Creative Destruction" and "Race Education-Technology), two related to firm strategies and work organisation ("Globalisation of Labour Markets" and "Dynamic of Work Organisation"), and two scenarios based on different approaches to digitalisation ("Platform Economy" and "Commons-based Peer Production").

The different scenarios include very different views of the potential consequences on the labour market and qualification policies, some more demand oriented, some more supply oriented, some more affirmative, and some more critical. Somehow extreme positons in this space are the Industry 4.0 scenario that focuses on the development of the existing (big) firms in the capitalist market, and the Commons-Based-Peer-Production scenario that focuses on the transaction regimes in the information economy and sees the model of the commons, contrasted to the model of the market and the state, as somehow congenial to digitalisation. The platform economy that focuses on the model of Silicon Valley also points to the disruptive mode of digitalisation, whereas the Industry 4.0 rather points to an incremental mode.

The analysis of the Austrian political discourse considering education, contrasted to that in Germany, has shown that mainly the two scenarios of Industry 4.0. and of Creative Destruction have been considered to some extent as competing discourses. The first discourse is focusing on the incremental development of demand in the enterprise sector and the question of how education might respond to that. The second is focusing on science and technology based innovation with its high emphasis on tertiary education. In the Industry 4.0 discourse Austria has focused on the challenges to the formal initial education system, whereas

¹ Lassnigg, Lorenz and Bock-Schappelwein, Julia (2019) Die Debatten um Industrie 4.0 und Bildung. Szenarien der Digitalisierung und ihr politischer Widerhall in Österreich und Deutschland. In: Dobischat, Rolf; Käplinger, Bernd; Molzberger, Gabriele and Münk, Dieter, (eds.) Bildung 2.1 für Arbeit 4.0? Bildung und Arbeit. Wiesbaden: Springer VS Verlag für Sozialwissenschaften, pp. 25-47. Publication extended draft (German) <http://www.equi.at/material/Ausfuehr-DE-AT-I40.pdf>; literature <http://www.equi.at/material/Recherche-DE-AT-I40.pdf>

Germany has focused on the challenges in work organisation and continuing education. In Austria the opposition between focusing on secondary level vocational education and focusing on tertiary education has strongly dominated the political discourse, and the developments in work organisation and continuing education have been rather neglected (whereas the German discourse has much focused on labour policies and continuing education). Overall the discourse has been organised very much in the institutions of co-ordinated capitalism, social partnership (Austria),¹ and industry lobbying (Germany).

At the policy level, it has been shown that the lifelong learning strategy of the 2010s (LLL:2020)² has failed to consider continuing education. An action line that focused on the support of learner friendly work environments for informal learning has not been taken up at all, rather it has transformed into how firms might support access to external non-formal courses in adult education. The political Industry 4.0 discourse has even neglected the LLL:2020 strategy and proposed a new further education strategy based on the new demands.³

If we further look at how the research institute of the employers' chamber looks at the skills demand (see ANNEX 15.10 Austrian studies).⁴ We see little consideration of the potential impact of digitalisation. Studies focus on demonstrating the current situation, focusing on current skills gaps with an eye on initial education and its potential of producing mismatch.

The starting discourse about a digitalisation strategy in the old SPOE-OEVP government⁵ has to some extent broadened the discourse, and also set up the digitalisation strategies for school, originally called school 4.0, then transformed into the masterplan.⁶

6.2 Comparative state of digitalisation until autumn 2019 (OECD)

If we want to answer the question of how Austria is ready for the changes expected by digitalisation, we can look at comparative material about education and innovation to get a view of the current position of the country on available indicators. ANNEX 15.11 and 15.12 give an overview about some selected indicators from OECD (2016)⁷ and from the CEDEFOP 2018 skills index.⁸

The OECD indicators give a picture about how far digitalisation has already penetrated the economy and the labour force or population, and about the availability of skills related to digitalisation. On these indicators Austria mostly scores at average level.

- Internet use in the population is below average in the overall population, but above average in the young population, with a bigger difference between these aggregates than expected by the trend line.

¹ See the platform Industry 4.0 <https://plattformindustrie40.at/>

² https://erwachsenenbildung.at/themen/lebenslanges_lernen/oesterreichische_strategie/aktuell.php

³ <https://plattformindustrie40.at/veranstaltung-der-plattform-industrie-4-0-zum-thema-aus-und-weiterbildung-am-22-07-2016-in-kooperation-mit-der-ak-wien/> (source removed)

⁴ See the documentation of studies about labour market and qualification demand <https://ibw.at/forschung/arbeitsmarkt-und-qualifikationsbedarf/>

⁵ See the 2016 digital roadmap <https://www.digitalroadmap.gv.at/>

⁶ <https://bildung.bmbwf.gv.at/schulen/schule40/index.html> (source changed)

⁷ OECD (2016), Innovating Education and Educating for Innovation: The Power of Digital Technologies and Skills, OECD Publishing, Paris. <http://dx.doi.org/10.1787/9789264265097-en>

⁸ "The index score is computed as the weighted geometric average of three pillar scores. Pillar scores are derived by calculating the weighted arithmetic average of the sub-pillar scores. Sub-pillar scores are calculated as the weighted arithmetic average of the indicator scores."(CEDEFOP 2019, 131).

CEDEFOP (2019), 2018 European skills index. Cedefop reference series 111. Luxembourg: Publications Office of the European Union.

- The use of computers at work is average, and jobs demand on the one hand comparatively seldom routine skills, and on average skills for solving unforeseen problems.
- People think around average that they have sufficient computer skills for finding a job (maybe a bit better situation among people with low or no education credential than people with high formal education), and the proportion of people who think they lack computer skills to do their job or to receive promotion/get a job is comparatively small.

Education, infrastructure, and research/innovation are seen as the three basic building blocks for digitalisation. According to the Digital Economy and Society Index (DESI), Digitalisation in Austria is slightly above average: DESI-Index¹ 12th overall, similar to Germany, Luxembourg, and Malta, ranks 9-12),

- public service (6th) and basic competencies (8th) are better ranked,
- integration in business (10th) and connectivity/infrastructure (14th) are around average,
- and private use is much behind (25th).

The Network Readiness Index of the WEF classifies Austria 20th among 143 countries in the world.

In the measurement of problem solving skills Austria scores at average, and labour force participation of people at the different levels of problem solving skills is always around average. Group comparisons indicate that older people and migrants have comparatively lower levels of problem solving skills, whereas low education or low literacy seems to have less negative consequences compared to other countries. The proportion of people without computer experience also scores around average, with a similar group specific pattern.

The participation in online courses is comparatively very low in Austria, and has increased slightly 2009 to 2013, however without changing the position almost at the end of the distribution.

The young people aged 15 use the internet outside school less than average, and at school more than average. In an index of ICT-use at school Austria scores nearer to the average, however. Access to computers at home is almost 100% (similar to Germany and Switzerland) and socio-economic differences are very small. Digital reading in this age group is at medium-to-low levels, comparatively fewer young people have good skills, and those with very low skills rank at average. The skills of task-oriented browsing are comparatively low in Austria.

Measurement of overall innovation at school, based on several indications from Large-Scale-Assessments,² gives Austria one of the worst positions; this measurement also indicates a much lower degree of innovation at classroom level than on the school level, at other dimensions, e.g., 4th vs. 8th grade, or math vs science the differences are small.

As another source, the CEDEFOP skills index positons Austria in the EU concerning the skills production. This index also includes one indicator concerning "high level computer skills". This aspect can be compared to the overall measurement of skills. Overall Austria ranks 10 in EU-28 on this index, with a good position at skills activation (rank 3) and fairly good position at skills development (rank 7), however, a weak position at skills matching. (rank 19). High level computer skills are part of the skills development dimension, a sub-

¹ <https://www.bmdw.gv.at/Services/Zahlen-Daten-Fakten/DigitalesInZahlen/Digital-Economy-and-Society-Index.html>

² It must be said that a high degree of this index consists of imputed data, because Austria has not participated so much in the Assessments used.

index of training and other activities, together with recent training activities and the proportion of VET-students. At this sub-index Austria has a good position, and within this sub-index the high-level computer skills are comparatively at average (VET-students are comparatively situated a bit higher, and recent training a bit lower).

The national education report 2018 (NBB 2018)¹ also gives some comparative indicators about computer and internet use, and age-specific problem solving competences, and some national indicators about school infrastructure and engagement of school in IT activities. Use of computer and internet are below average, and below Germany. Competences are slightly above average, and rising with younger age (16-24y compared to 25-34y), probably because of informal learning. Gender differences are very marked, and much higher than in selected countries for comparison, women/girls having worse competences.

The school IT infrastructure is very diverse regionally and does not indicate any systematic policy so far. School engagement according to a quality label is very low in compulsory schools (less than 1% in primary school, less than 3% in lower secondary common school), and a bit higher in post-compulsory schools (less than 10% in academic general schools, and in vocational schools ranging between 5% in business-tourism-craft and 15% in technical-engineering schools).

Overall, answering the question, Austria seems not very well prepared for digitalisation, but the situation is not very bad either. The strong concentration on the Industry 4.0 scenario in the initial phase on the one hand, and the concentration of skills analyses on the traditional sectors and the current problems on the other hand, seem to limit the perspective. The more radical scenarios are in strong contrast to the existing structures of regulation and industrial relations; thus, the risks are much emphasised in the political discourse. The recent disputes about working time can be seen as a symptom of this, limiting a constructive discourse about potential developments. The German discourse about labour politics (Arbeitspolitik) seems a more constructive path than the Austrian focus on skills gaps and external non-formal education.

The approach towards basic digital competences at school seems feasible, but the strong focus on STEM at the upper secondary and tertiary levels seems quite limited. The OECD research about innovation and education has plead for a broader approach already some years ago:

“Skills for innovation. Education policies to foster innovation have traditionally focused on increasing participation in science, technology, engineering, and mathematics (STEM) disciplines. Recently, however, a more comprehensive view of innovation has emerged which recognises the contribution of a wider set of skills and disciplines. While STEM specialists are undoubtedly important for certain types of innovation, particularly technological innovation, government policy needs to take a broad view of the competencies used in the innovation process” (OECD 2016, 22).

Various classifications of important skills are presented and discussed, with creativity, critical thinking, and communication as important dimensions.

¹ https://www.bifie.at/wp-content/uploads/2019/04/NBB_2018_Band1_v4_final.pdf

7.0 Digital competences of pupils, students and teachers

Competences of pupils

Section 6.2 and ANNEX 15.11-12 give a quite extensive picture about the ICT penetration and competence levels in the population and among young people. The overall position is on most indicators around average. Thus, if competitiveness depends much on ICT skills Austria is not very well prepared, however, also not very badly.

Competences of teachers.

Digital competences of teachers have been observed and compared in TALIS 2018. Austria is the only participating country where all variables concerning teachers and ICT are significantly below average (ANNEX 15.8). This concerns the following variables and is to some extent contradictory:¹ Teachers don't get much instruction initially and recently, feel not well prepared, and don't let students use much ICT, however, don't feel need for more instruction and their principals also don't see shortage of technology for instruction.

Already in the 2011-12 reference study² the compulsory school teachers' confidence was below the EU level in social media, and it was overall quite low in the primary school sector, concerning also operational skills (in the other sectors, grade 8, and 11 general and vocational the confidence in operational skills was above average).

Competence models, gender differences, and preparedness for the future.

The *different digital competences (DigComp 2.0)* are established as competence models, and should be included into instruction and assessment.

Gender differences are very pronounced in Austria, with females having lower ICT skills.

If we take the paper by the Industry 4.0 qualification and competences group, they see quite good conditions for adaptation to the challenges. In principle they see the basic competences prevalent, that must be amended with the various digital competences, from basic digital competences to the specific competences in the various industries.

The paper points to the need of infrastructure, and strongly emphasises the further education of teachers and trainers.

Evaluation of teachers' competences

¹ Percentage of teachers for whom the “use of ICT for teaching” has been included in their formal education or training

Percentage of teachers who felt “well prepared” or “very well prepared” for the use of ICT for teaching

Percentage of teachers for whom “use of ICT for teaching” has been included in their recent professional development activities

Percentage of teachers reporting a high level of need for professional development in ICT skills for teaching

Percentage of teachers who “frequently” or “always” let students use ICT for projects or class work

Percentage of principals reporting shortage or inadequacy of digital technology for instruction

² SURVEY OF SCHOOLS: ICT IN EDUCATION. COUNTRY PROFILE: AUSTRIA

https://ec.europa.eu/information_society/newsroom/image/document/2018-3/austria_country_profile_2EEA9CE6-DEBB-90FC-9BC1E567E4489935_49428.pdf

A self-assessment tool for teachers has been set up (digi.check). Otherwise the assessment of teachers' competences is a highly disputed issue in Austria. The interest organisations do not like it, and Austria did not take part in the previous round of TALIS, so the comparative picture is quite holey.

A student has tried to provide an app for pupils to give their teachers stars, however, this has provoked much dispute and even juridical threats, so the initiative was ended before it really started.¹

8.0 Use of digital technologies for learning

There is no current overview available about the use of digital devices. We can only provide an overview about selected analyses available about digital practices

School

-Communities at eEducation:² DLPL BeeBots-robot, Lego WeDo; Scratch creative programming language; tools for visualisation (Video Cutter, Youtube Video Editor, Filmora, OpenShot, iMovie, Camtasia) BBC micro bit; Edusharing open source e-learning integration solution

-National report in collaborative education lab-project: does not mention specific tools³

-Topics of digital publications in PH online journal⁴ do hardly give such a concrete picture, concrete practices mentioned are: playing, calculation, interactive mathematics workbook, authentic text production, digital advertising, inverted classroom, laboratory practice, Microsoft tools

Higher Education

-Topics in publications by Forum Neue Medien⁵ include learning analytics, gamification in moodle, digital archives, OER open educational resources, digital exams/assessment, quality evaluation, live streaming (see ANNEX 15.6).

-2016 survey about e-learning⁶ gives an overview about quite general categories of e-learning: social media use, full online course, MOOC, mobile learning, recording course, game-based learning, blended learning (see ANNEX 15.7).

Use of technology

In the **school sector** the incidence of schools in the eEducation network has been analysed.⁷ Due to these analysis 38% of all schools have somehow registered in the eEducaiton network, of these 36% (14% of all schools) have gained expert status and 44% of registered schools have been identified being active (17% of all schools), and of these active schools two thirds have expert status.

¹ Die Presse (18.11.2019) Lehrer-App schlecht bewertet <https://www.diepresse.com/5724206/lehrer-app-schlecht-bewertet>

² <https://community.eeducation.at/course/index.php?categoryid=9>

³ http://colab.eun.org/c/document_library/get_file?uuid=5c77f3a6-86ed-4e54-bcc6-e7d4be593572&groupId=5897016

⁴ <https://journal.ph-noe.ac.at/index.php/resource/search/search>

⁵ <https://www.fnma.at/publikationen/eigene-publikationen>

⁶ Die österreichische Hochschul-E-Learning-Landschaft, (2016) Bratengeyer, E., Steinbacher, H.-P., Friesenbichler, M., Neuböck, K., Kopp, M., Gröblinger, O., Ebner, M. Books on Demand <https://www.fnma.at/content/download/1431/4895>

⁷ Digitale Bildung für alle! Zur Wirkung der eEducation Initiative. eEducation-Team & Peter Baumgartner, 2018-11-16, presentation <https://peter.baumgartner.name/wp-content/uploads/2018/11/eeducation-graz.pdf>; Digitale Bildung für alle! Zur Wirkung der eEducation Initiative eEducation-Team & Peter Baumgartner, 2017-11-24, presentation <https://eeducation.at/fileadmin/downloads/Keynote-Salzburg.pdf>

The 2016 inventory of e-learning gives a rough overview about use in **higher education** institutions. Three quarters of the institutions use e-learning institution-wide, the rest only in some areas or by some individuals. ANNEX 15.7 shows the incidence of the different approaches. Blended learning, course recording, and social media learning are quite commonly used; mobile learning, full online courses and gaming are used more seldom, and MOOCs are very seldom used; there is also information about the use of materials and digital systems.

Innovative practices

The approach of the eEducation initiative is an interesting approach by using a gamification approach for the involvement of schools in digitalisation activities. The observers discuss the potentials of developing this initiative towards a community of practice by strengthening the gamification through a higher number of steps and a better calibration of activities.

The DLPL Denken lernen – Probleme lösen in combination with the EIS Education Innovation Studios at PH in the sector of primary education seems also an interesting approach. Several digital instruments are used for the involvement of young pupils in creative digital activities, whereby schools and PHs work together and can develop cooperation as well as methodology and content.

9.0 Educational staff and stakeholders

According to TALIS 2018 ICT has been below average included in initial and continuing education and teachers also don't feel well prepared for digitalisation (ANNEX 15.8).

A digital competence model for teachers (digi.compP) has been developed that might improve the situation.¹

A Virtual PH has been set up and instruments for self-assessment (digi.check)² and continuing education (digi.folio)³ have been set up ,

The new competence model (ANNEX 15.9) is very comprehensive, however, its practical consequences are hardly to be seen.

According to TALIS teachers are not very confident, however, they don't really see much demand for improvement either (ANNEX 15.8)

The role of private stakeholders is not transparent. E.g., private organisation and enterprises, including big firms like IBM, Samsung or SAP, are visible as partners of the eEducation initiative, however, their role in the partnership is not visible.

¹ <https://www.bmbwf.gv.at/Themen/schule/zrp/dibi/paed.html>

² <https://digicheck.at/>

³ <https://www.digifolio.at/>, die Maßnahme digi.folio umfasst: #1 einen digitalen Kompetenzcheck (digi.checkP), #2 eine 6 ECTS-umfassende individuell-maßgeschneiderte Fortbildungsmaßnahme, #3 die Reflexion der eigenen Lehrtätigkeit in einem digitalen Praxisportfolio, #4 den Nachweis der erworbenen Kompetenzen

10.0 Digital infrastructure, equipment and tools in schools and higher education

The school infrastructure has been more or less on an average level in the 2011-12 reference study, this has not changed basically (ANNEX 15.3).¹

Overall, the infrastructure is less/below average developed in primary school and well developed in upper secondary vocational schools, in particular in engineering and business schools; the lower secondary and upper secondary general schools are lying in between.

There are differences between regions, however, neither systematic patterns nor consistent policies can be found to explain these differences.

Investment is not transparent. However, the financing of the masterplan is still an open issue that contrasts with the plans for financial austerity. The recent reforms in the school sector stood always under the priority of cost neutrality. The government announcement of the masterplan expressively states that financing problems might impede the development. Concerning the provision of free tablets or laptops ideas about leasing, and support by the big firms could be heard.

Maybe the foreseen financial restrictions can be lowered by support through the European funds.

OECD indicators show that the access to computers at home is almost 100% and socio-economic differences are very small (see ANNEX 15.11). Student use of own devices in school has been higher than their use of school owned devices already in the 2011-12 reference study.

A main demand of the Socialdemocratic Party during the last election campaign was to provide free tablets at primary school and free laptops at lower secondary school for all pupils.

10.1.1 Update September 2020: 8-points-plan for digitalization

Strategies for digitalisation and digital education have been set up in 2016 and 2017 by the social democratic led government and the social democratic ministry.² The new short-lived right wing government has set up a new expensive strategic development group to provide a new strategy. That group has provided a quite short and general abstract mapping paper later than planned that is currently sold as a "Masterplan" at the BMBWF webpage. It includes some regrouping of topics, and new formulations, however no concrete planning, and finally rather a statement that development will depend on resources, and quick results should not be expected.³ The big insights of the high level group have been that digitalisation requires hardware, software and teacher education and competences, and should consider methods and didactics, age adequate practices, interest and motivation particularly of girls, knowledge-skills-competences for the labour market, and creative potential and talents of pupils, measures should be provided till 2023.

Fired by the pandemic an eight-points-plan was formulated, including the following priorities:⁴

¹ The quantitative volume of the national education report (NBB) 2018 provides some indicators about infrastructure, indicator B6 Digitalisierung im Schulwesen https://www.bifie.at/wp-content/uploads/2019/03/NBB_2018_Band1_Indikator_B.pdf

² Digital Roadmap Austria <https://www.digitalroadmap.gv.at/>; Schule 4.0 https://eeducation.at/fileadmin/downloads/Folien_17-11-24_eEducationFachtagung.pdf

³ BMBWF webpage Masterplan für die Digitalisierung im Bildungswesen <https://www.bmbwf.gv.at/Themen/schule/zrp/dibi/mp.html>, full text https://www.bmbwf.gv.at/dam/jcr:dbc3a630-8034-47aa-9e9d-4db35e58867c/masterplan_digitalisierung_pi.pdf

⁴ BMBWF webpage „8-Punkte-Plan für den digitalen Unterricht“ <https://www.bmbwf.gv.at/Themen/schule/zrp/dibi.html>; the points are the following: 1. Portal Digitale Schule; 2. Vereinheitlichung der Plattformen; 3. Lehrendenfortbildung; 4. Ausrichtung der

1. a digital comprehensive portal, including all functions from administration, through communication among groups, to teaching material
2. use of common platforms at least at individual school level, that was made immediately compulsory
3. continuing teacher education, in particular the Distance Learning MOOC
4. re-organising of Eduthek devices by curricula
5. approval of learning-apps, see the examples in Annex by the competence centre (section 2.3.4)
6. provision of basic school infrastructure, development of norm-facilities, e.g., broadband, WLAN, additional 60 schools (out of 6.000) planned for this year)
7. digital end devices for pupils, starting with grades 5 and 6, and then including grade 5 of every successive year, however, only “engaged schools” with digitalisation plans are meant to be included
8. digital end devices for teachers related to the involved school classes (pt.7)

For the overall plan 200 million EURO are mentioned till 2022 (66-to-100 million per year, around 33.000 EURO per school of 6.000 schools).

The digital portal concerns the creation of an overall platform for digitalisation. The variety of platforms even within a class has been a main problem during the pandemic, now schools should immediately select a common platform. The MOOC stated in August has been consumed voluntarily by 10.000 teachers.¹

The lack of sufficient school infrastructure has proved as the main problem during the pandemics, however, the current explicit plan of additional 60 schools seems a very low target.

The provision of end devices has been started this year; however, this seems not to be the main gap quantitatively, but concerns the most disadvantaged pupils; teachers rather demand the possibility of tax reductions for their private devices than provision of new ones; office smart phones are rather demanded.

11.0 Other challenges related to digital education

The participation in digital activities is rather voluntary within the given regulations; e.g., the compulsory subject Digitale Grundbildung can also be delivered within other subjects (so it might be questionable to which extent it really will be delivered, if we take into account that the competences are lacking to some extent); or the participation in the eEducation networks is voluntary.

Eduthek nach Lehrplänen; 5. Gütesiegel Lern-Apps; 6. Ausbau der schulischen Basis IT-Infrastruktur; 7. Digitale Endgeräte für Schülerinnen und Schüler; 8. Digitale Endgeräte für Lehrerinnen und Lehrer.

¹ Die Furche (09.09.2020) Schulstart im Corona-Herbst. Mit welchen Erwartungen gehen Eltern, Lehrkräfte und Politik ins neue Schuljahr? Und wie wirkt der Lockdown nach? Eine crossmediale Debatte mit Sibylle Hamann, Thomas Krebs und Elisabeth Fröhlich über digitale Kompetenzen, Erschöpfung, Outdoor-Unterricht und die neue Schule nach Corona.

<https://www.furche.at/gesellschaft/schulstart-im-corona-herbst-3660235>; see also Die Furche webpage

<https://www.furche.at/dossier/schule-in-zeiten-von-corona>; ÖLI-UG Österreichische Lehrer/innen Initiative - Unabhängige Gewerkschafter/innen <https://www.oeliug.at/newsblog/>

To some extent the establishment of the national eEducation initiative can be seen as a step towards leadership, however, it might be questionable to which extent this institution really owns sufficient authority to really provide leadership.

In the implementation of the masterplan a specific plan for leadership seems not included.

12.0 Inventory of available data sets

Austria is very much dependent on the international data sets. During the Covid-19 crisis some new ad-hoc data have been collected.

13.0 Case studies and success stories

Assessment of the material did not find really good case studies, and a problem with the pilot projects found is that they do not give a valid picture about success. The studies found are mostly “advocatory” in the sense that they provide descriptions of some activities, and some material that shows how the artefacts are implemented, and how the involved persons accept and comment them. The problem raised is mostly how to overcome resistance or suspicions.

Examples typical for such studies that are sold prominently at the ministries webpage are, e.g., the very sketchy country report of the Collaborative Education Lab project, that is quite disappointing, giving a long litany of opinions about workshops, without any systematic thrust except the organising questions;¹ or the accompanying research of the mobile learning, that gives a good overview of how the project went on, and the experience with the measures taken – however, it can hardly be taken as really good practice.²

In **higher education** a case study is available about the digital practices in one institution.³ This study is based on a survey among teaching personnel and students that gives an overview about the use and consume of various technical (digital) methods, and ratings of aspects like use, user-friendliness, etc.

¹ Country reports http://colab.eun.org/c/document_library/get_file?uuid=5c77f3a6-86ed-4e54-bcc6-e7d4be593572&groupId=5897016

² Mobile learning 2nd study summary <https://zli.phwien.ac.at/mobile-learning-studie-2017-18/>; full report https://zli.phwien.ac.at/wp-content/uploads/2018/10/Mobile-Learning-2017_18_Begleitstudie_Abschlussbericht_PH-Wien.pdf; best practice examples https://static.uni-graz.at/fileadmin/projekte/mobile-learning/Broschuere_Tablets_Entwurf.pdf

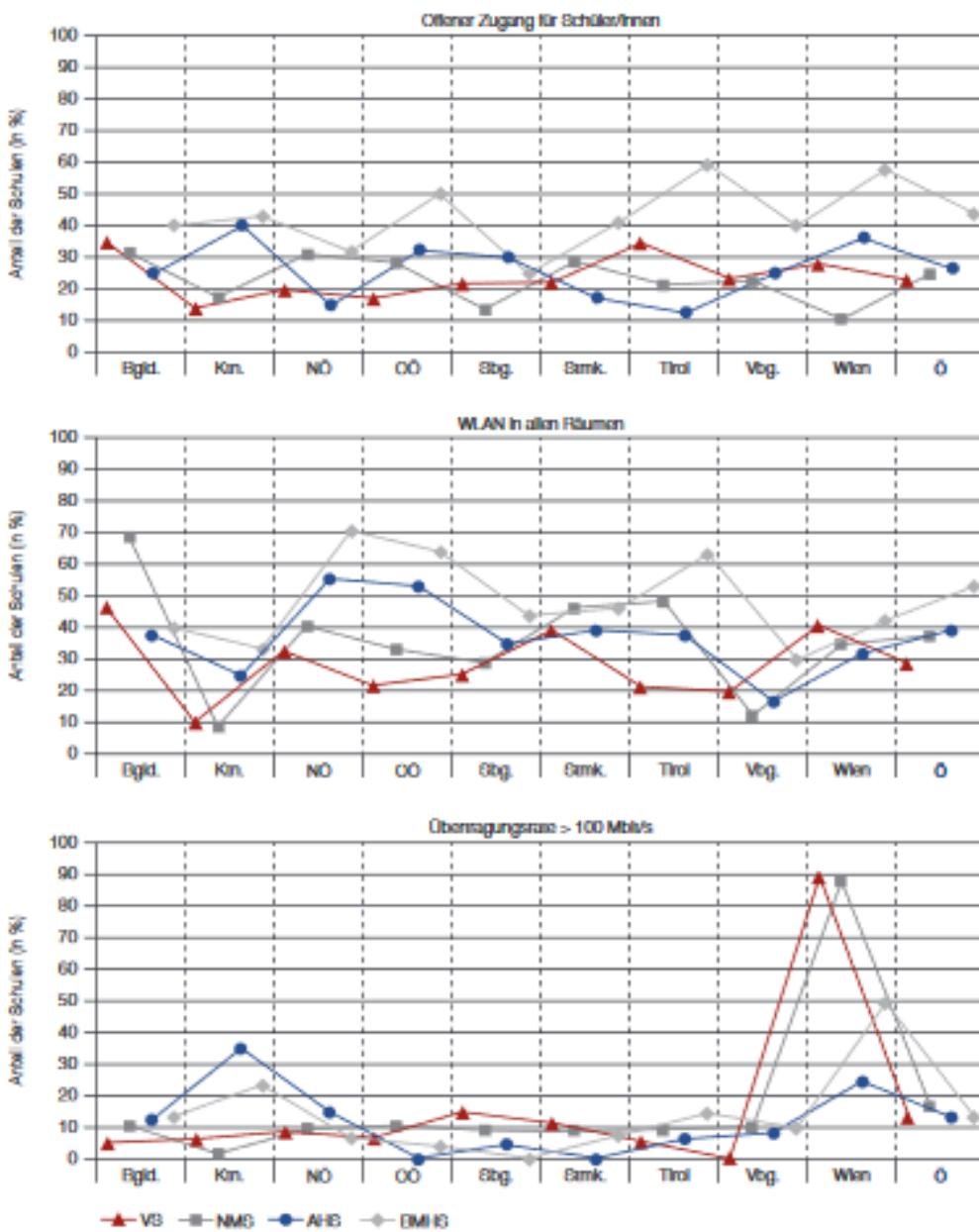
³ Technologiegestütztes Lehren und Lernen an der Fachhochschule CAMPUS 02 – Eine Studie zur Erhebung der IST-Situation (2019) Schweighofer, Patrick & Zullus, Günter, Books on Demand <https://www.fnma.at/content/download/1738/7195>

SOURCES, ILLUSTRATIONS

14.0 ANNEX I (Covid-19)

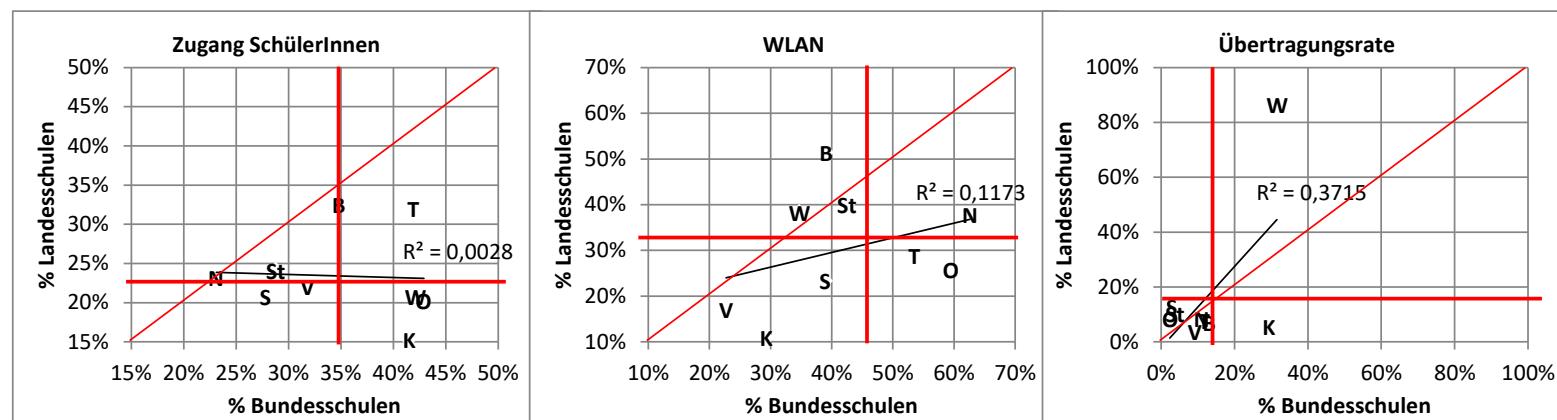
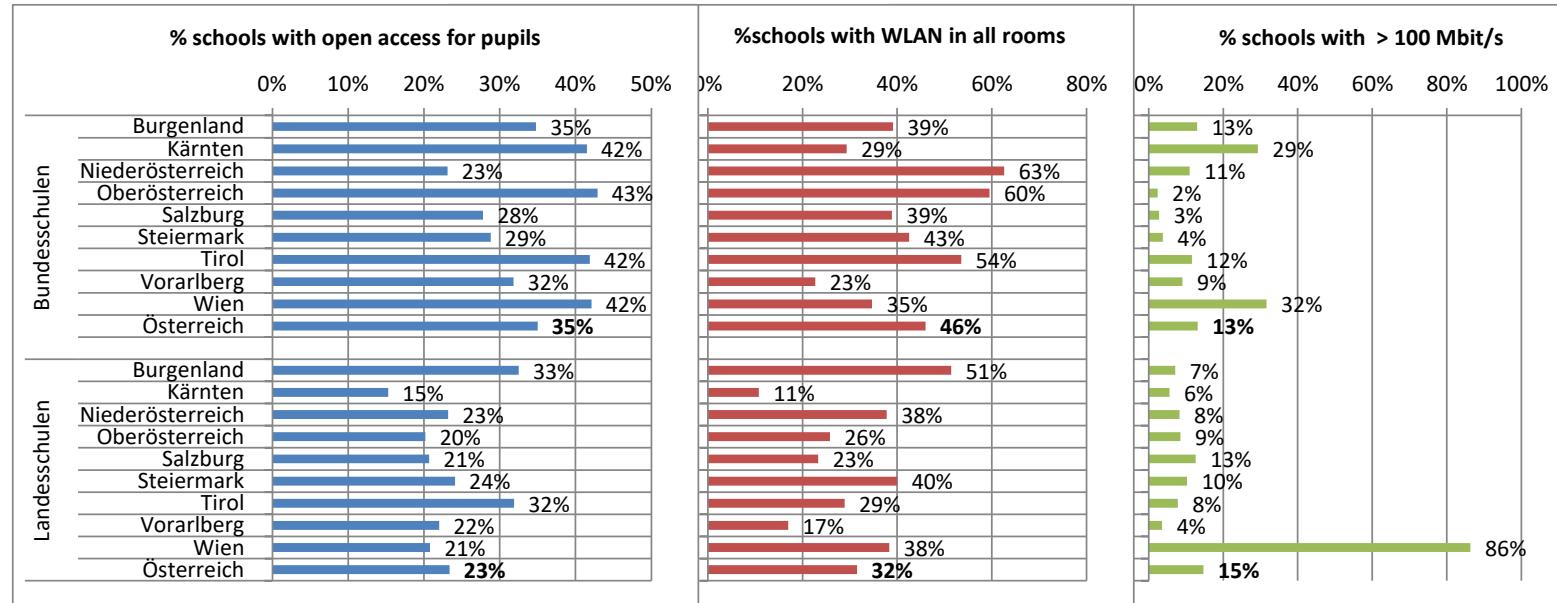
14.1 Infrastructure according to National Education Report 2018

Abb. B6.e: IT-Infrastruktur nach Bundesländern und Schulsparte (2016)



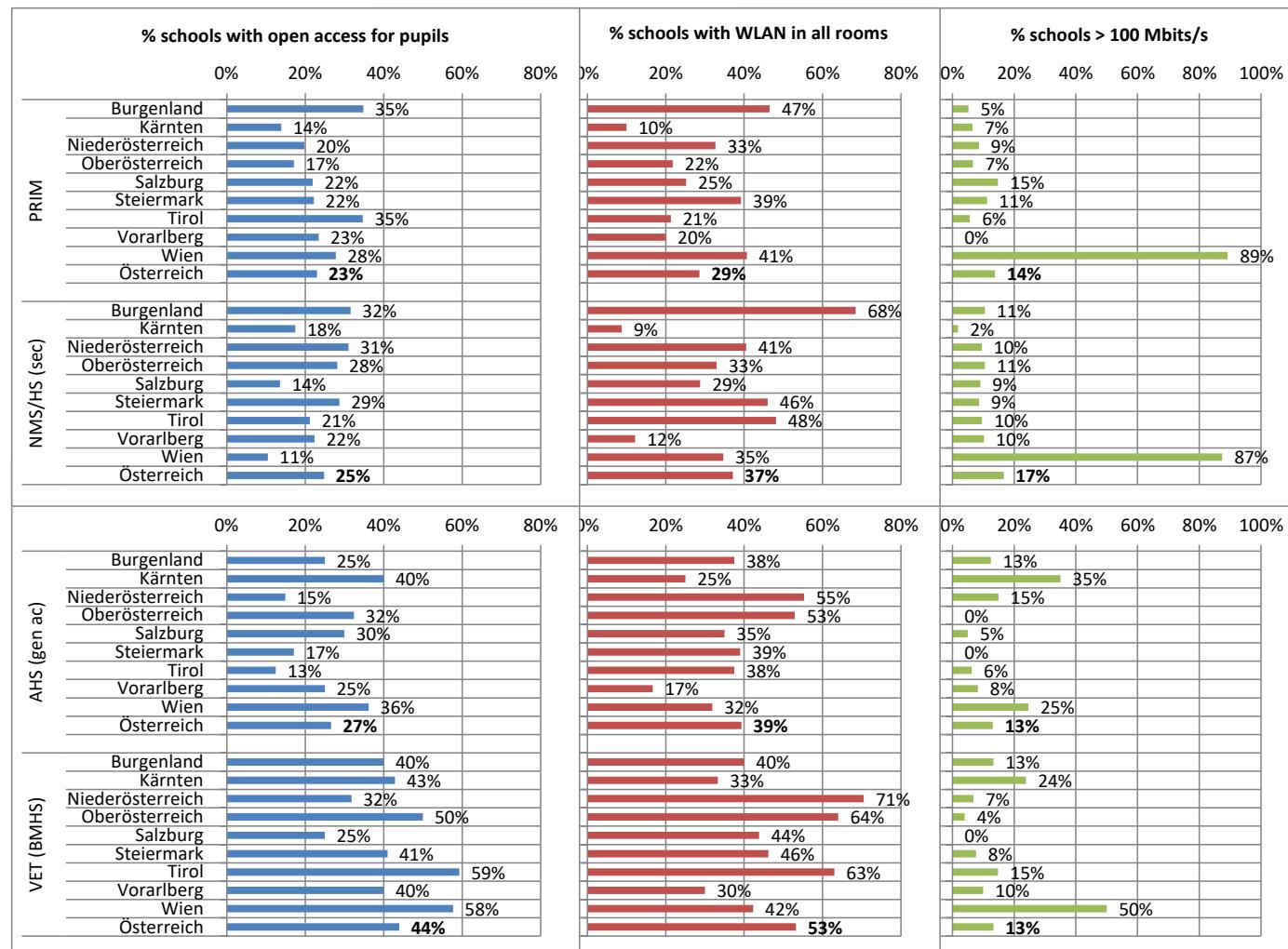
Quelle: BMB (IT-Infrastrukturerhebung 2016). Berechnung und Darstellung: NBB.

Infrastructure by governance levels (central and regional schools)



Source: own figure calculation based on BMB (2017) IKT-Infrastrukturerhebung 2016. Internetanbindung und Internetnutzung an österreichischen Schulen.
https://bildung.bmbwf.gv.at/schulen/schule40/ikt_infrastruktur_2016_laender.pdf?61edz0

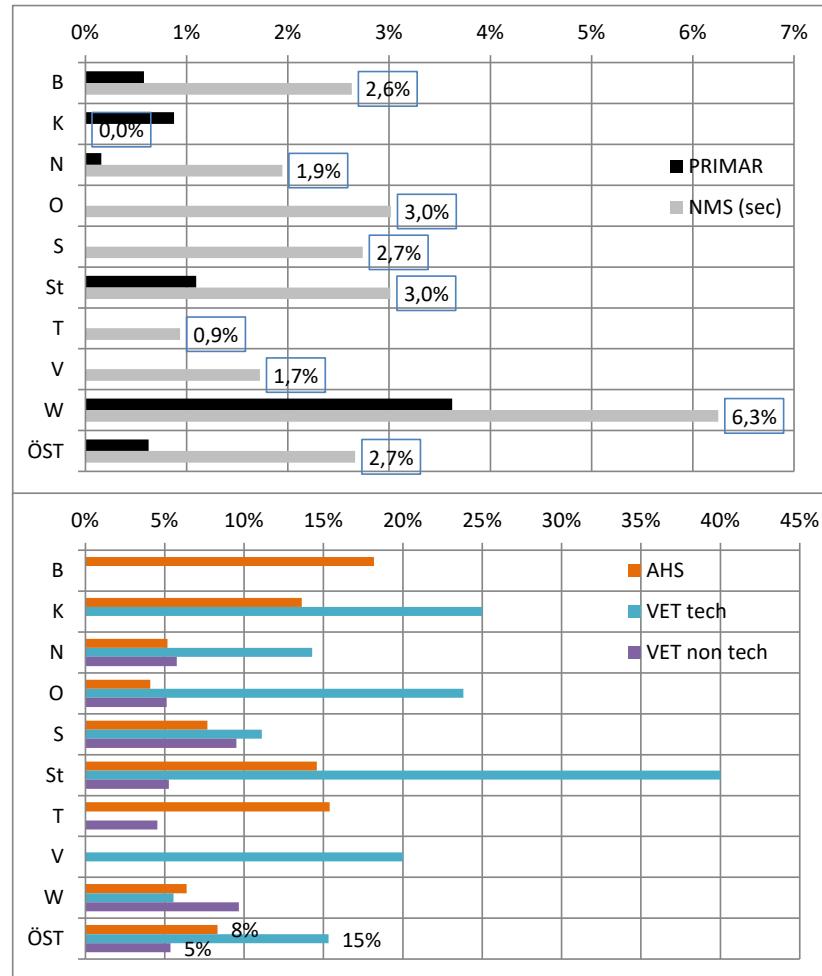
Infrastructure by school sectors (regional schools: PRIM, NMS/HS; central schools: AHS, BMHS)



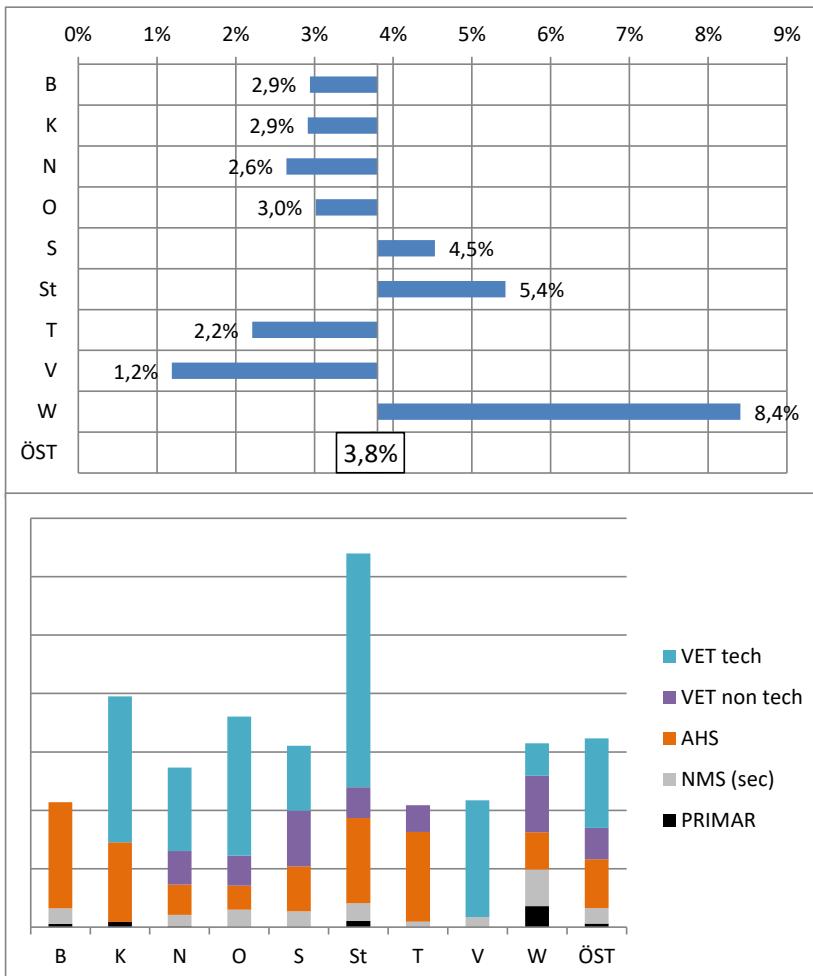
Source: own figure calculation based on BMB (2017) IKT-Infrastrukturerhebung 2016. Internetanbindung und Internetnutzung an österreichischen Schulen.
https://bildung.bmbwf.gv.at/schulen/schule40/ikt_infrastruktur_2016_laender.pdf?61edz0

Digitalisation awards (Gütesiegel) in schools

% Gütesiegel per school sector

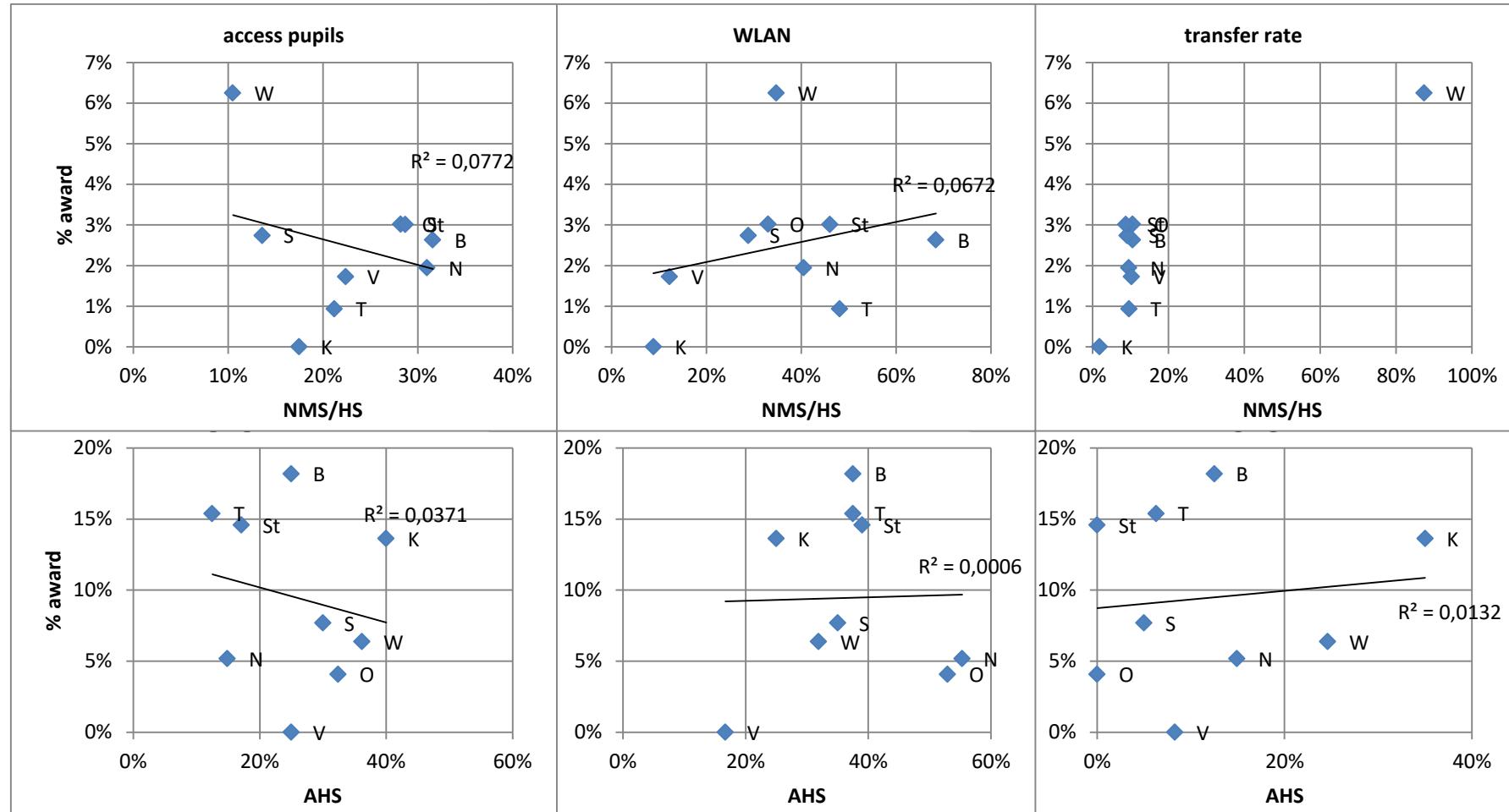


summaries: % of total (upper), cumulative % (lower)



Source: own figure calculation based on Web-documentation <http://www.mintschule.at/mint-landkarte/>

Correlation between IT-infrastructure and digitalisation awards in school types (NMS/HS, AHS) per regions

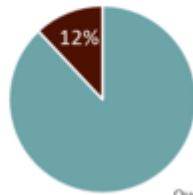


Source: Information from figures above

14.2 Data, Surveys

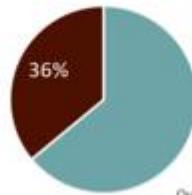
14.2.1 Teacher Survey

Anteil der SchülerInnen, die in der Covid19-Phase des Home-Schoolings nicht oder nur schlecht erreicht wurden



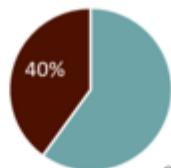
Quelle: IHS-LehrerInnenbefragung
n = 3.200

Anteil der benachteiligten* SchülerInnen, die in der Covid19-Phase des Home-Schoolings nicht oder nur schlecht erreicht wurden



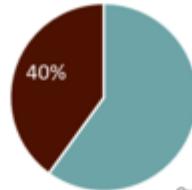
Quelle: IHS-LehrerInnenbefragung
n = 2.597

Anteil der SchülerInnen, die zu Hause nicht das notwendige Ausmaß an Unterstützung erhalten, das sie zur Bewältigung der Schulaufgaben brauchen



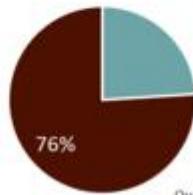
Quelle: IHS-LehrerInnenbefragung
n = 2.232

Ich habe Sorge, dass sich das Kompetenzniveau der SchülerInnen während der Covid19-Phase verschlechtert



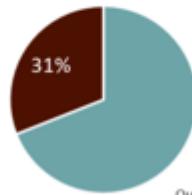
Quelle: IHS-LehrerInnenbefragung
n = 2.270

Ich habe Sorge, dass sich das Kompetenzniveau der benachteiligten* SchülerInnen während der Covid19-Phase verschlechtert



Quelle: IHS-LehrerInnenbefragung
n = 1.834

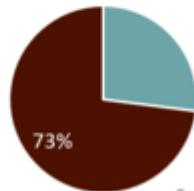
Anteil der SchülerInnen, die mich im Home-Schooling positiv überraschten, weil sie meine Erwartungen übertroffen haben



Quelle: IHS-LehrerInnenbefragung
n = 2.291

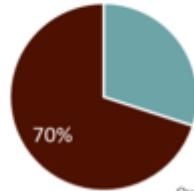
*Benachteiligung basiert auf einer Einschätzung der LehrerInnen, was die Unterstützung/Förderung durch die Eltern, die materiellen Verhältnisse, die technische Ausstattung zu Hause sowie die privaten Wohnverhältnisse ihrer SchülerInnen betrifft.

Mir steht ein zu geringes Ausmaß schulinterner Lernunterstützung (z.B. Integrations-, StützlehrerInnen) zur Verfügung



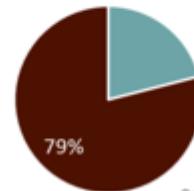
Quelle: IHS-LehrerInnenbefragung
n = 2.790

Mein Stundenaufwand für den Unterricht jetzt während des Home-Schoolings ist im Vergleich zum Normalbetrieb höher



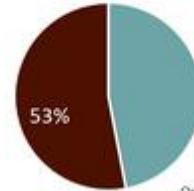
Quelle: IHS-LehrerInnenbefragung
n = 2.445

Mir steht ein zu geringes Ausmaß an Unterstützung durch Schulsozialarbeit/Schulpsychologie zur Verfügung



Quelle: IHS-LehrerInnenbefragung
n = 2.760

Mein Wohlbefinden jetzt während des Home-Schoolings ist im Vergleich zum Normalbetrieb deutlich schlechter



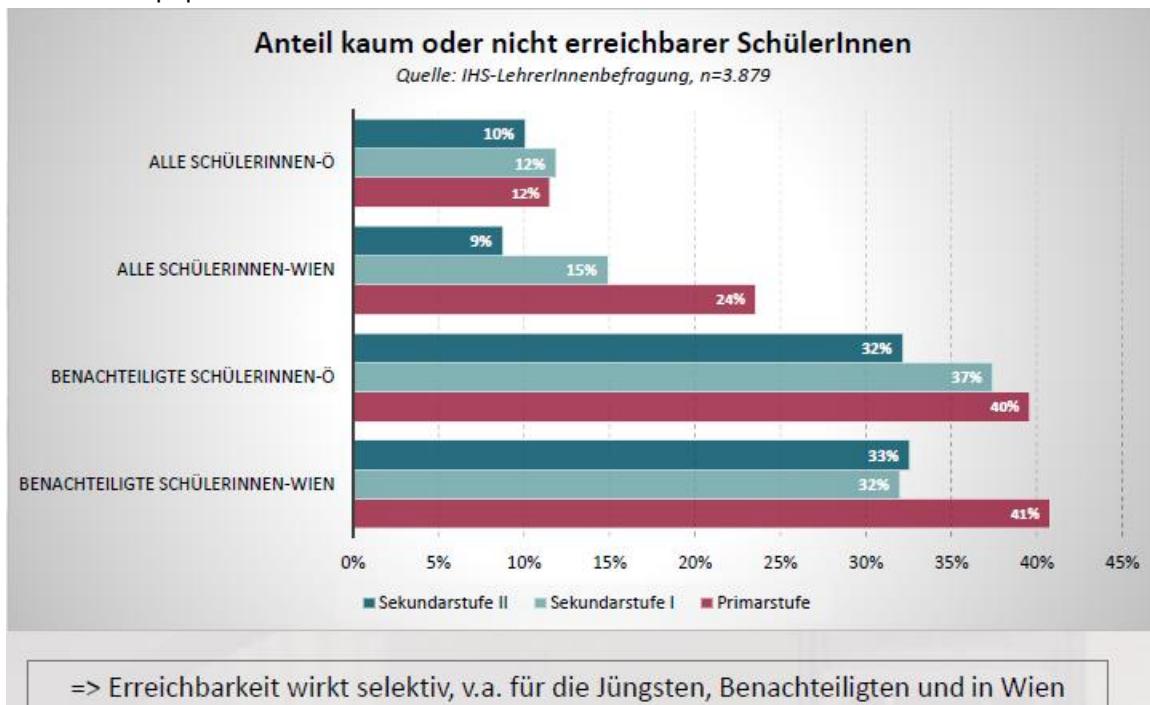
Quelle: IHS-LehrerInnenbefragung
n = 2.442

Source: <https://www.ihs.ac.at/publications-hub/blog/beitraege/lehrerinnenbefragung-zwischenergebnisse/>

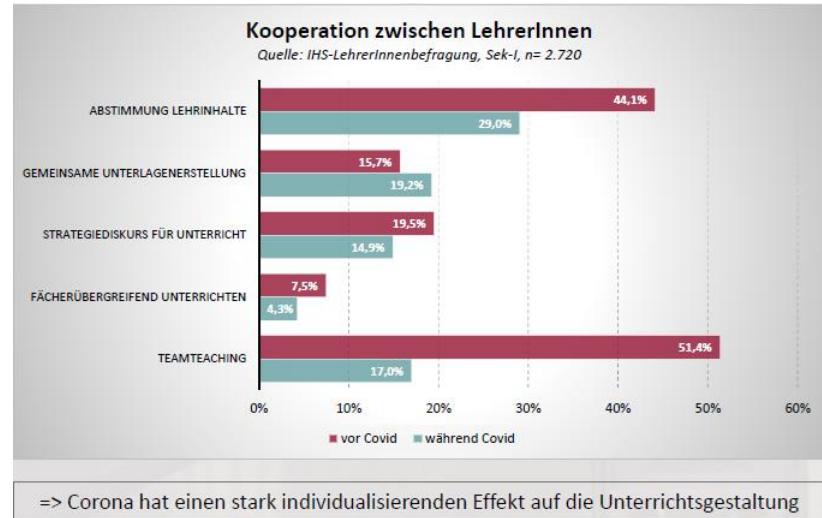
Extended results IHS survey

https://www.ihs.ac.at/fileadmin/public/2016_Files/Photos/Veranstaltungen/2020/Leben_mit_Corona/Presentations/S5_Steiner.pdf

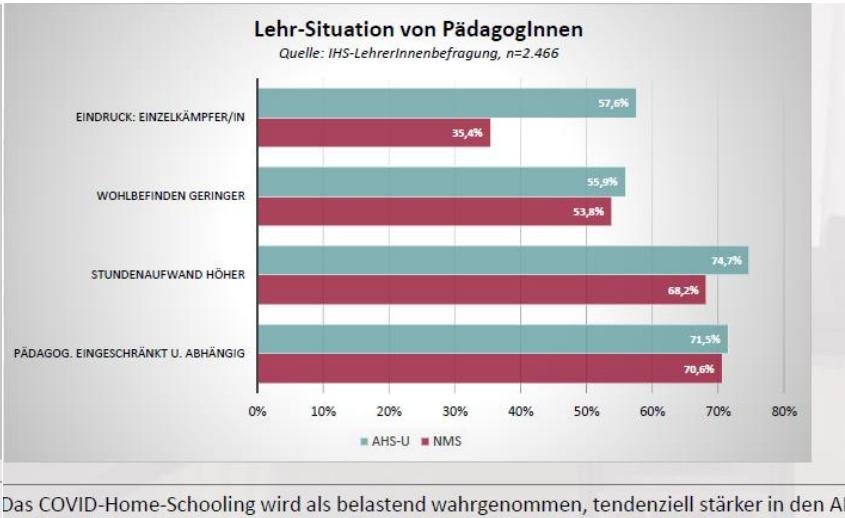
Not reachable pupils



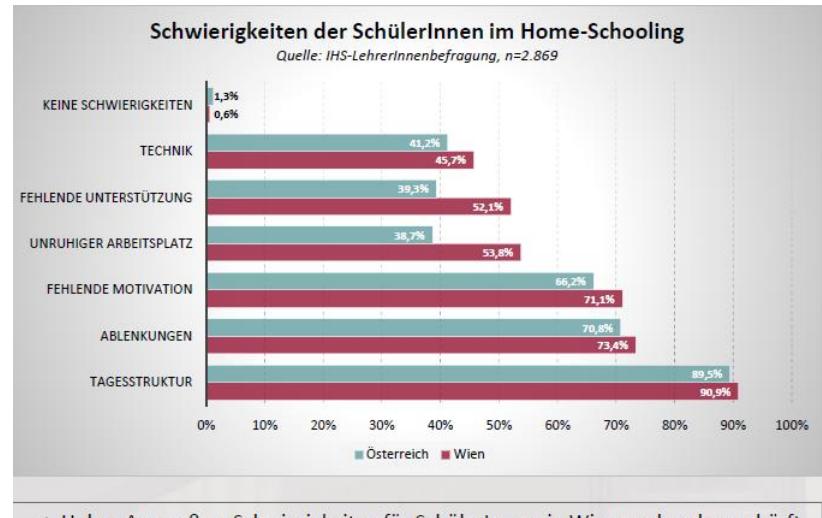
Teacher cooperation, before and during COVID



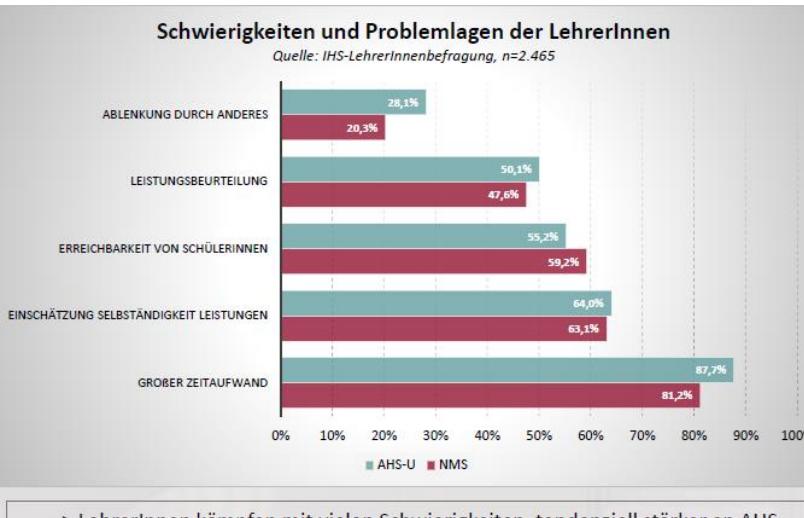
AHS, NMS during COVID



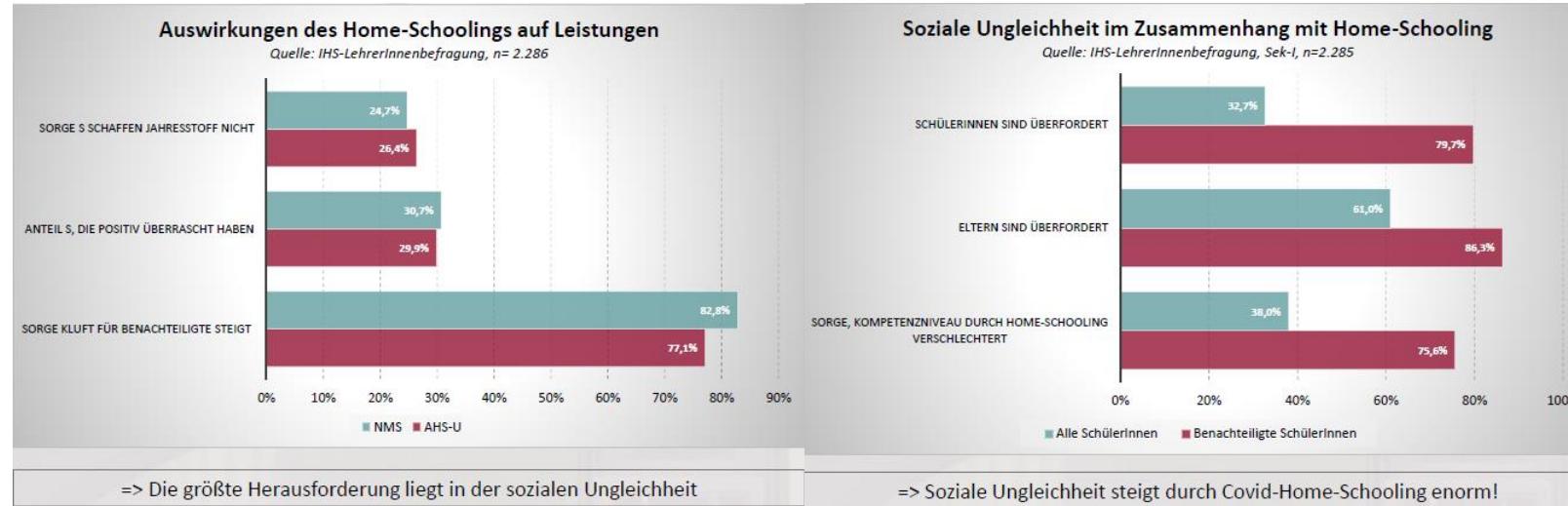
Difficulties perceived by teachers: ...among pupils Austria/Vienna



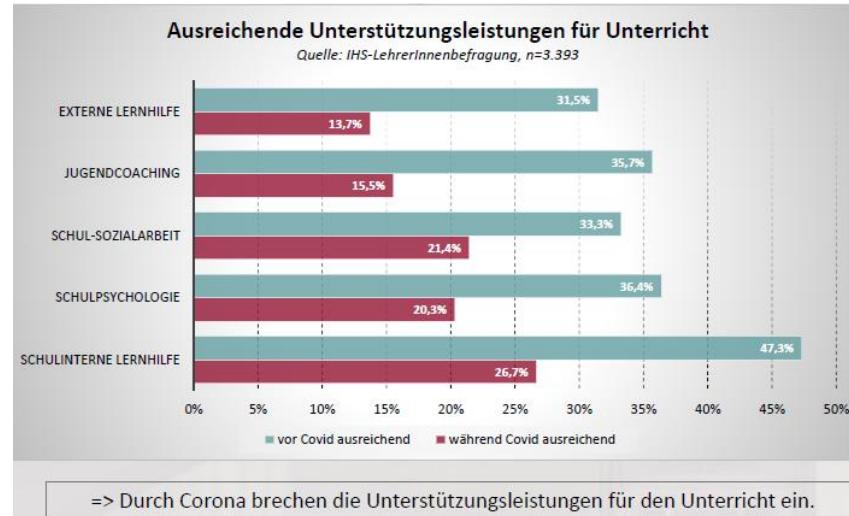
...among teachers, AHS/NMS



Effects of homeschooling on achievement and social inequality



Support infrastructure, before and during COVID



Der jugendliche Blick auf die COVID-19-Maßnahmen

Marketagent und DocLX haben derweil in Österreichs größter Jugend-Trendstudie zum Thema „COVID-19“ mit 3.811 Teilnehmern im Alter zwischen 14 und 24 Jahren herausgefunden, wie es Kindern und Jugendlichen aktuell geht: Im neuen Alltag vermissen 82 Prozent der jungen Österreicher den persönlichen Kontakt mit Freunden und 62 Prozent Partys und Festivitäten. 41,1 Prozent bedauern, derzeit keine Reisen und Ausflüge machen zu können. Der reale Schul- und Universitätsalltag geht nur 34,7 Prozent der Umfrageteilnehmer ab. Konzerte oder Festivals vermissen 22,1 Prozent, 20,4 Prozent fehlt das Treffen mit dem eigenen Partner und 15,6 Prozent der Theater- oder Kinobesuch.

Maturanten haben mulmiges Gefühl vor der Matura

Mit dem digitalen Unterricht zuhause kommen 80,2 Prozent der Befragten sehr gut oder gut zurecht. Nur knapp jeder Fünfte fühlt sich im digitalen Klassenzimmer noch nicht ganz so wohl. Ein etwas anderes Bild zeichnet sich unter den Maturanten ab: 61,1 Prozent blicken besorgt auf die bevorstehende Matura. Wenn diese einmal geschafft ist, wollen 77,6 Prozent auf Maturareise fahren und den Abschluss gemeinsam feiern. Bei den Wunschdestinationen führt Kroatien mit 95,6 Prozent Zustimmung deutlich vor Spanien (10,1 Prozent) und Italien (5,2 Prozent). Österreich steht mit 4,7 Prozent Zustimmung ebenfalls nicht sehr weit oben auf der Wunschliste. Den Weg zur Maturareise wollen 63,5 Prozent auf dem Landweg mit Bus oder Auto antreten. Ein Flug kommt nur für 12,9 Prozent der Befragten infrage.

Source: https://www.meinbezirk.at/c-politik/schuloeffnung-mit-maskenpflicht-und-fuenf-kindern-pro-klaesse-im-mai_a4038939, based on <https://b2b.marketagent.com/aktuelles/presse/jugend-trendmonitor-2020/>

Laut der Bildungspsychologin Christiane Spiel (Uni Wien) dürfte die Bildungsschere in den vergangenen Wochen "ordentlich aufgegangen sein". Laut einer an ihrem Department durchgeführten Studie mit rund 8.300 Schülern zwischen zehn und 19 Jahren hätten etwa 16 Prozent angegeben, über keinen eigenen Laptop bzw. Tablet zu verfügen, 21 Prozent hatten keine Unterstützung beim Lernen. Dazu müsse man noch bedenken, dass die Befragung online durchgeführt worden sei - wer überhaupt kein Endgerät zur Verfügung habe, konnte also gar nicht teilnehmen.

Source: <https://www.vienna.at/schulen-in-oesterreich-oeffnen-wieder-so-wird-der-unterricht-ablaufen/6598137>; https://science.apa.at/rubrik/bildung/Schule_und_Unis_-_Psychologen_eforschen_Lernen_in_Corona-Zeiten/SCI_20200407_SCI854068796

„So ergab etwa eine Analyse, dass in den vergangenen Wochen rund zwei Prozent der Wiener Schüler nicht adäquat erreicht werden konnten. Das sind laut Bildungsstadtrat Jürgen Czernohorszky in konkreten Zahlen etwa 3.500 Kinder und Jugendliche. Mit 5.000 Laptops sei man daher hier gut aufgestellt. Diese Laptops könnten als erster Schritt ab sofort über die Schulen bezogen werden. Die Geräte bleiben auch ab dem Herbst weiter für den Unterricht zur Verfügung.“

Source: <https://wien.orf.at/stories/3044088/>

14.3 Practical advice for young children, Commune of Vienna

No mention of learning in advice for scheduling the day: “**Fixer Tagesablauf**

- Behalten Sie den üblichen Tagesablauf bei, auch wenn der Kindergarten wegfällt. Das gibt Ihrem Kind Halt und Sicherheit.
- Wecken Sie das Kind um die gleiche Zeit wie immer. Das Kind soll sich anziehen und frühstücken, als ob es in den Kindergarten gehen würde. Auch am Abend sollten sie Ihr Kind zur gewohnten Zeit ins Bett bringen. Lesen Sie Ihrem Kind eine Geschichte vor oder singen Sie ein Lied, das hilft beim Einschlafen.
- Planen Sie tagsüber fixe Zeiten für Spielen, Bewegung und Essen ein. Spielen Sie gemeinsam, aber lassen Sie Ihrem Kind auch Zeit für Entspannung und Rückzug.
- Vereinbaren Sie mit Ihrem Kind fixe Zeiten für Handy, Computer und Fernsehen.
- Machen Sie gemeinsam mit ihrem Kind Bewegung in der Wohnung oder im eigenen Garten. Mit Turnen, Tanzen oder Yoga halten Sie sich und Ihr Kind fit. Außerdem hilft Bewegung dabei, Stress und Anspannung abzubauen.
- Essen Sie zu regelmäßigen Zeiten und gemeinsam mit Ihrem Kind. Kochen Sie gemeinsam oder backen Sie einen Kuchen. Wenn Ihr Kind alt genug ist, kann es Ihnen vielleicht dabei helfen oder zumindest zuschauen.
- Je nach Alter und Entwicklungsstand kann Ihr Kind auch bei der Hausarbeit mithelfen, zum Beispiel beim Aufräumen oder Wäsche aufhängen.
- Halten Sie gemeinsam mit Ihrem Kind Kontakt zur Familie und zu Freunden über Telefon und Videochats. Lassen Sie auch Ihr Kind mit Oma oder Opa telefonieren.“

Source: <https://coronavirus.wien.gv.at/site/alltag-mit-kindern/>

14.4 Utilisation of digital material

“Herr Minister Faßmann, ich möchte aber auch nicht undankbar erscheinen: Als Hilfestellung für die Corona-Maturanten wurde eine [Plattform](#) mit tausenden Videos völlig kostenfrei zugänglich gemacht, wo jedes einzelne Mathematik-Maturabeispiel seit Einführung der Zentralmatura fachmännisch erklärt wird. Das ist eine Ressource, die es in dieser Form noch nie gab. Das ist eine Unterstützung für alle, die Verantwortung übernehmen und selbstständig lernen und üben wollen. Das ist etwas, was keine Schule von sich aus anbieten und leisten kann. Der einzige Wermutstropfen an dieser Sache war, dass ein hoher Anteil der Lehrer es wahrscheinlich nicht an ihre Schüler kommuniziert hat. Vielleicht wussten sie es selber nicht. Von meinen Grazer Maturanten war leider keiner darüber informiert.“

Source: <https://www.derstandard.at/story/2000117827222/nehmen-sie-es-wie-ein-mann-herr-fassmann?ref=rec>

14.5 Summer schools, explorative indicators

Summer schools, indicators by regions, primary (VS) and lower secondary (NMS) schools

		Schulen tot	SO St.ort	SO/Schulen	Sozl 67	SO/Sozl 67	% Sozl 67	Schül tot	Schü/SO
VS	ÖST	3026	270	9%	209	1,29	7%	342116	1 267
	Burgenland	171	11	6%	0	-	0%	10350	941
	Kärnten	227	19	8%	4	4,65	2%	20468	1 077
	Niederösterreich	633	57	9%	14	4,09	2%	64836	1 137
	Oberösterreich	550	45	8%	41	1,09	8%	61717	1 371
	Salzburg	180	28	16%	5	5,56	3%	21408	765
	Steiermark	449	41	9%	17	2,47	4%	44476	1 085
	Tirol	362	17	5%	4	4,27	1%	29067	1 710
	Vorarlberg	170	23	14%	8	2,76	5%	16868	733
	Wien	284	29	10%	122	0,24	43%	72926	2 515
NMS	ÖST	1126	200	18%	189	1,06	17%	206512	1 033
	Burgenland	38	6	16%	0	-	0%	6829	1 138
	Kärnten	66	25	38%	1	25,25	2%	12404	496
	Niederösterreich	256	33	13%	12	2,74	5%	39168	1 187
	Oberösterreich	232	44	19%	37	1,19	16%	41271	938
	Salzburg	71	26	37%	7	3,74	10%	13933	536
	Steiermark	166	30	18%	15	2,01	9%	28175	939
	Tirol	106	11	10%	10	1,12	9%	20457	1 860
	Vorarlberg	60	12	20%	13	0,95	21%	12005	1 000
	Wien	131	13	10%	99	0,13	76%	32270	2 482

Source: own compilation based on various sources, Statistics Austria, info-map of summer schools at BMBWF website, media information

Legend:

Schulen tot=total number of schools

SO St.ort=number of summer school sites

SO/Schulen=% summer school sites

Sozl 67=number of schools with very low social index (6 mainly native low educated parents, 7 mainly migrant low educated parents)

SO/Sozl 67=summer school sites related to low index schools

% Sozl 67=% of low index schools

Schül tot=total number of pupils

Schü/SO=total number of pupils related to number of summer school sites

Summer school indicators, primary and secondary school together, schools and pupils

	Schulen tot	SO St.ort	SO/Schulen	Sozl 67	SO/Sozl 67	% Sozl 67	Schül	Schü/SO
Gesamt	4152	470	11%	398	1,18	10%	548628	1 167
Burgenland	209	17	8%	0		0%	17179	1 011
Kärnten	293	44	15%	5	8,67	2%	32872	747
Niederösterreich	889	90	10%	26	3,47	3%	104004	1 156
Oberösterreich	782	89	11%	78	1,14	10%	102988	1 157
Salzburg	251	54	22%	12	4,50	5%	35341	654
Steiermark	615	71	12%	32	2,25	5%	72651	1 023
Tirol	468	28	6%	14	2,02	3%	49524	1 769
Vorarlberg	230	35	15%	21	1,67	9%	28873	825
Wien	415	42	10%	221	0,19	53%	105196	2 505

Source, Legend see previous

Indicators participants/registered, summer school personnel, organisation

	Anmeld Som	Schül/Som	Lehrpers APS total	Lehrpers Som/total	Pers Som total	Pers/Som	Lehrp Som	Stud Som	% Lehrp Som	*Grup/Som	*Pers/Grup
Gesamt	24670	52	74787	1,9%	2864	6	1428	1436	50%	4	1,5
Burgenland	550	32	2261	2,2%	85	5	50	35	59%	2	2,0
Kärnten	1260	29	4523	2,0%	189	4	90	99	48%	2	2,0
Niederösterreich	3500	39	14293	1,5%	480	5	220	260	46%	3	1,8
Oberösterreich	3500	39	14135	2,1%	460	5	300	160	65%	3	1,7
Salzburg	1600	30	5204	2,5%	380	7	128	256	34%	2	3,1
Steiermark	2700	38	8989	2,2%	400	6	200	200	50%	3	1,9
Tirol	2000	71	7038	1,1%	210	8	80	130	38%	5	1,4
Vorarlberg	1560	45	4616	2,4%	160	5	110	50	69%	3	1,3
Wien	8000	190	13729	1,8%	500	12	250	250	50%	15	0,8

Source: own compilation based on various sources, Statistics Austria, info-map of summer schools at BMBWF website, media information

Legend:

Anmeld Som=participants (measured by registered)

Schül/Som=pupils per Som site

Lehrpers APS total=teachers in compulsory education total

Lehrpers Som/total=% teachers participating in Som

Pers Som total=total number of personnel participating in Som (teachers and students)

Pers/Som=personnel per Som site

Lehrp Som=number of teachers participating (*italics: proportion unknown*, total estimated according to known share)

Stud Som=number of students participating

% Lehrp Som=% of teachers among personnel Som

*Grup/Som=number of groups per site estimated by rough average group size 23(illustrative)

*Pers/Grup=personnel per site related to calculated number of groups per site (illustrative)

14.6 Overview about current topics in higher education (hyperlinks)

Webpage BMBWF higher education: Aktuelles

Coronavirus (COVID-2019)

- [COVID-19: Faßmann legt Leitfaden für den gesicherten Hochschulbetrieb für das kommende Studienjahr vor](#)
- [COVID-19-Regelungspaket für Hochschulen: Mit COVID-19-Hochschul-Aufnahmeverordnung \(C-HAV\) liegt letzter Baustein vor](#)
- [Informationen und Empfehlungen für Studierende, Mitarbeiter/innen und Forschende](#)
- [Online-Befragung: 60% der Studierenden beurteilen die erfolgte Umstellung der Lehre auf Distance- bzw. Online-Learning als gut](#)

Other

- [Positives Zeugnis für Österreichs Hochschulsystem durch die Studierenden-Sozialerhebung 2019](#)
- [Leitfaden: Gute Wissenschaftliche Praxis bei Distanzprüfungen 2020 \(nicht barrierefrei\) \(PDF, 162 KB\)](#)
- [FH Ausbau 2021/22](#)
- [Gelingener Startschuss für neue Etappe in der Digitalisierung der Universitäten](#)
- [Neuaufage des Gesamtösterreichischen Universitätsentwicklungsplans GUEP 2022 bis 2027](#)
- [Übergang Schule-Hochschule – ein neuralgischer Punkt für den Bildungserfolg](#)
- [Universitäten: Autonomie und Aufsicht im ständigen Wechselspiel](#)
- [Statistisches Taschenbuch - Hochschulen und Forschung 2019 \(PDF, 6 MB\)](#)
- [Learning Analytics nützen dem Hochschulsystem, vor allem aber den Studierenden](#)
- [Neue UNESCO-Konvention zur einfacheren Anerkennung von Hochschulqualifikationen](#)
- [Die OECD bestätigt: Österreichs Hochschulen treiben Innovation und Entrepreneurship erfolgreich voran](#)

Source: <https://www.bmbwf.gv.at/Themen/HS-Uni/Aktuelles.html>

15.0 ANNEX 2 (digitalisation)

15.1 Inspiration for masterplan: Singapore and Hongkong

Bundesministerium
Bildung, Wissenschaft
und Forschung

bmbwf.gv.at

Digitales Klassenzimmer: Die Regierung baut am „Masterplan Digitalisierung“.



Auf ihrer Reise nach Singapur und Hongkong stellten ÖVP-Kanzler Sebastian Kurz und Bildungsminister Heinz Faßmann einen bildungspolitischen Meilenstein vor.

Digitale Bildung in Österreich

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<https://www.oe24.at/oesterreich/politik/Gratis-Tablets-So-wird-die-Schule-der-Zukunft/347023999>

See the source: <https://www.oe24.at/oesterreich/politik/Gratis-Tablets-So-wird-die-Schule-der-Zukunft/347023999>

15.2 Number of schools active in eEducation Network



<https://eeducation.at/index.php?id=2&L=0>

15.3 Overview Infrastructure by levels

Wo stehen wir

		NMS	AHS	BMHS
Internet-Breitband-Downstream	> 40 Mbit/s > 100 Mbit/s	40,6 % 13,7 %	37,1 % 34,5 %	42,8 % 38,8 %
WLAN in allen Unterrichtsräumen		45,5 %	50,6 %	59,6 %
Eigene Notebook-/Tabletklassen mit schülereigenen Geräten		5,9 %	6,4 %	14,6 %
Einsatz von schülereigenen Geräten im Unterricht:	Notebooks Smartphone Tablets	11,6 % 66,1 % 13,6 %	65,2 % 77,2 % 33,0 %	69,2 % 70,4 % 40,0 %
Pädagogisches Konzept zum Einsatz digitaler Technologien im Unterricht		65,5 %	58,8 %	50,0 %

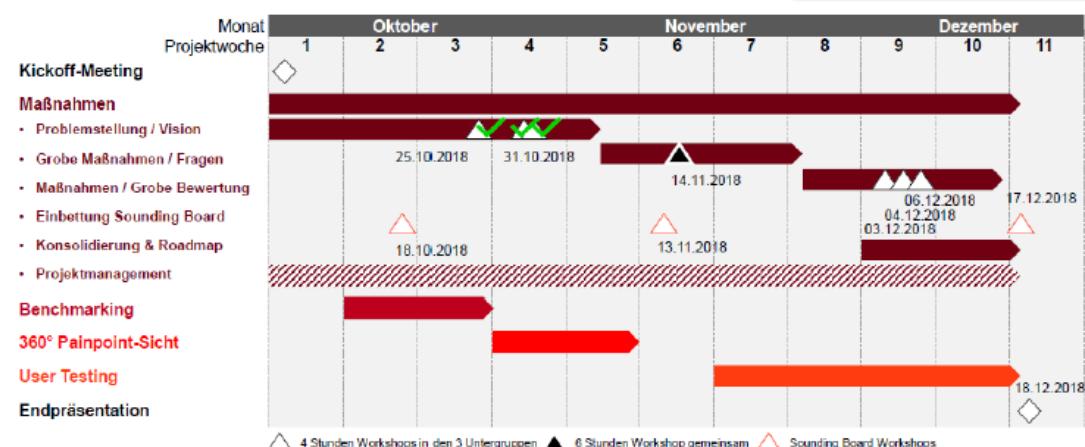
Quelle: IT-Infrastrukturerhebung des BMBWF 2018

8

https://eeducation.at/fileadmin/user_upload/Folien_Strohmeyer_Digitalisierung_BMBWF.pptx

15.4 Overview masterplan

Zeitplan Masterplan „Digitalisierung in der Bildung“



Digitale Bildung in Österreich

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https://www.uibk.ac.at/fakultaeten/lehrerinnenbildung/aktuelles/2018/images/2018/2018-11-23_digitalbildunginoesterreich.pdf

15.5 Selected analyses of online Journal about digitalisation

- [Ein Gegenstand „Digitale Medienbildung und Informatik“ – notwendige Bedingung für digitale Kompetenz?](#) Gerhard Brandhofer 2014-04-15
- [Learning by Playing – Wie digitale Spiele den Erwerb von Kompetenzen unterstützen können.](#) Sonja Gabriel 2018-04-15
- [Computer, Tablet or Graphing Calculator](#) Lilla Korenova 2014-10-27
- [Educational Aspects of Digital Humanism](#) Slávka Krásna, Silvia Barnová 2017-12-04
- [Training Teachers in Digital Literacy Children as Digital Natives: Implications for Visual Spatial Functioning Skills and Teacher Preparedness](#) Kathleen Keefe-Cooperman 2018-08-31
- [Medienbildung im Kontext der Digitalisierung: Ein integratives Modell für digitale Kompetenzen](#) Gerhard Brandhofer, Christian Wiesner 2018-10-14
- [Interactive Mathematics-Workbook on a pen-enabled display](#) Kurt Söser 2014-11-19
- [Promoting less commonly taught languages in the digital age](#) Eva Gröstenberger 2018-08-31
- [Digital Competence Through Authentic, Self-Made Texts](#) Maria Bajner 2018-08-31
- [Impact of Digital Technologies on the English Language](#) Juraj Miština 2018-12-03
- [Innovationen in der Weiterbildung von Lehrkräften durch Digitalisierung Umsetzung an der Pädagogischen Hochschule Niederösterreich](#) Norbert Kraker 2017-10-15
- [How Technical Teacher Use Digital Means in Their Teaching Practice](#) Alena Hašková, Ján Záhorec 2019-11-29
- [The influence of digital advertising on the current generation Digital Advertising materials and there negative effects](#) Miriam Mattova 2017-12-04
- ["Computer Security" and its importance in engineer education](#) Ildikó Pšenáková, Veronika Stoffová 2015-12-09
- [Das historische Mentoring ab 1700; Der Hofmeister im Focus eines Mentors Beitrag zur Internationalen Woche 2019 der Pädagogischen Hochschule Niederösterreich](#) Gustav Bergmeier 2019-06-24
- [Inverted Classroom Model as a chance to enhance didactics and computer literacy Possibilities and limitations in initiating a professionalization process in an Induction Phase](#) Gerhard Brandhofer, Peter Großböck 2015-12-09
- [How to respond to changes in technologies in occupational safety and health experts' training?](#) Ivana Tureková 2018-12-03
- [CAS and Secondary School Mathematics: Mathematical Tasks in Principle become Tasks in Practice](#) Peter Flynn 2014-11-20
- [Writing to learn in der Grünen Pädagogik Ein Schreib-Lern-Arrangement am Beispiel "Begriffsdefinition"](#) Carmen Ilona Sippl 2018-04-14
- [Inspirations from Outside](#) Josef Böhm 2014-11-20
- [Optimization of the laboratory practice by means of information and communication technologies](#) Pavlo Chykunov 2019-11-29

[Online Instruction and Online Tutoring in University Contexts](#) Silvia Barnová, Slávka Krásna 2019-11-29

[How to pimp up digital learning](#) Eine Wirksamkeitsstudie zum verstärkten Einsatz von Microsoft-Tools im Regelunterricht Johannes Dorfinger 2019-10-14

15.6 Publications Forum Neue Medien

- 1 Tagungsband zur 2. Online-Tagung Hochschule digital.innovativ | #digiPH2:
Digital-innovative Hochschulen: Einblicke in Wissenschaft und Praxis
- 2 Whitepaper Learning Analytics
- 3 Technologiegestütztes Lehren und Lernen an der Fachhochschule CAMPUS 02 –
Eine Studie zur Erhebung der IST-Situation
- 4 Hochschule digital.innovativ | #digiPH Tagungsband zur 1. Online-Tagung
- 5 Gamification in Moodle
- 6 Digitale Archivierung und Bereitstellung von AV-Medien
- 7 Konzept OER-Zertifizierung an österreichischen Hochschulen
- 9 Empfehlungen für die Integration von Open Educational Resources an
Hochschulen in Österreich
- 10 Die österreichische Hochschul-E-Learning-Landschaft
- 11 eLearning Qualitäts-Evaluationstool
- 12 Hochschulübergreifender Leitfaden für den kreativen Teil bei der Erstellung
anwendungsorientierter Prüfungsfragen
- 13 Live-Streaming: Technologien, Systeme und Lösungen zur Übertragung von
Lehrveranstaltungen

<https://www.fnma.at/publikationen/eigene-publikationen>

15.7 Study e-learning in higher education

15.7.1 Online practices in Higher education

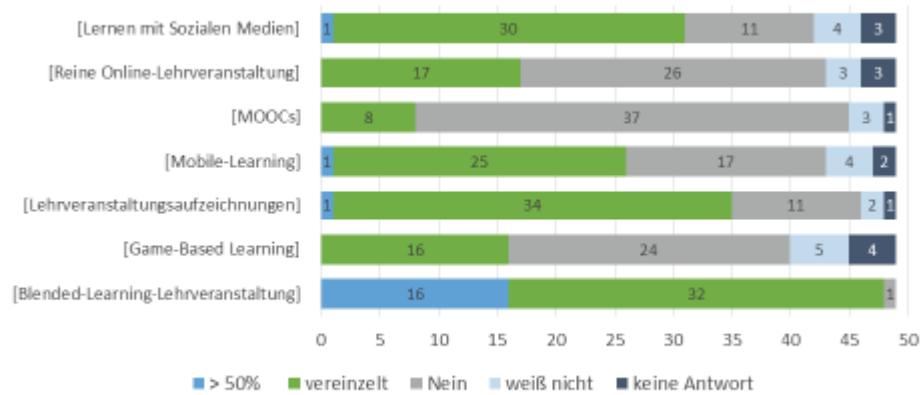


Abbildung 7 - Anzahl der HS mit jeweiligen E-Learning-Angeboten, HS gesamt

<https://www.fnma.at/content/download/1431/4895> p.41

15.7.2 Use of digital teaching materials

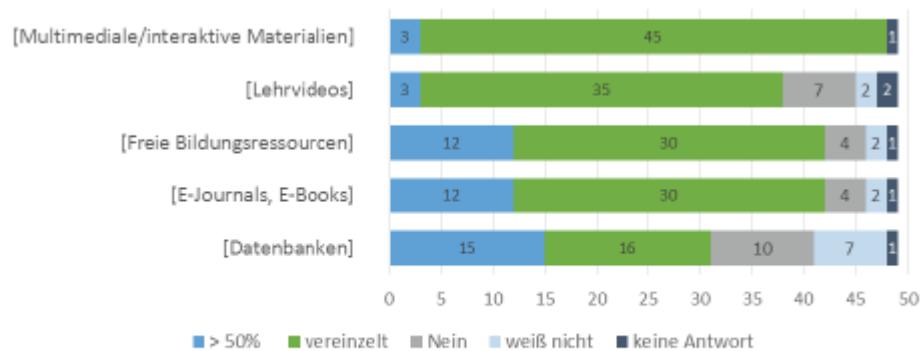


Abbildung 10 - Anzahl der HS mit zur Verfügung gestellten Lehrmaterialien, HS gesamt

<https://www.fnma.at/content/download/1431/4895> p.43

15.7.3 Use of digital systems and methods

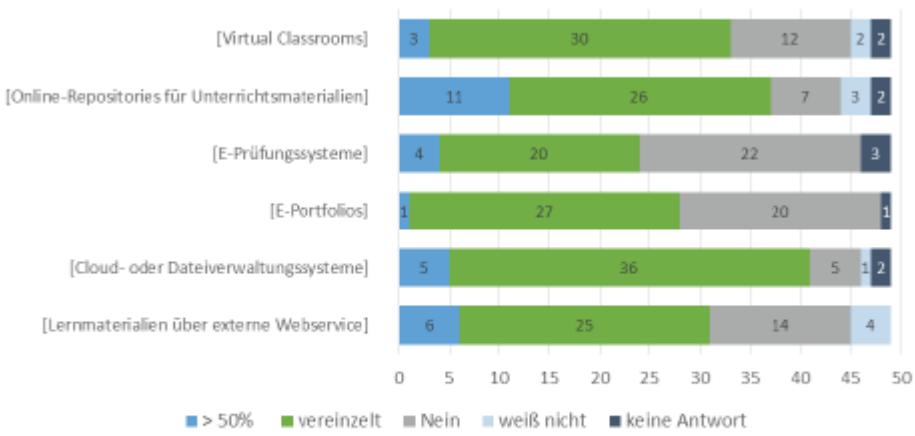


Abbildung 15 - Anzahl der HS mit verwendeten Systemen und Methoden in der Lehre,
HS gesamt. Mehrfachnennungen möglich

<https://www.fnma.at/content/download/1431/4895> p.47

15.7.4 Technical methods used in an institution (case study)

a.teaching personnel

Eingesetzte Methoden	absolut	relativ bezogen auf Anzahl Personen
Zurverfügungstellung von digitalen Inhalten von Dritten (zB. youtube, links, papers)	80	55,9%
Moodle Forum	66	46,2%
Moodle-Test/Quiz	50	35,0%
Online Feedback (zB. auf Klausuren, Übungen, Projektarbeiten etc. via Moodle oder Office 365)	45	31,5%
Vortrag mit Dokumentenkamera	34	23,8%
Lernvideos/Screencasts (selbst erstellt)	26	18,2%
Kollaboratives Arbeiten mit Office 365 Word/EXCEL/Powerpoint	22	15,4%
Klausuren am PC (außer Moodle Test)	21	14,7%
Vortrag mit Tablet mit Stift	19	13,3%
Kahoot	19	13,3%
Moodle WIKI/Glossar	16	11,2%
Office 365 OneNote/Class Notebook	9	6,3%
Quizlet	5	3,5%
Facebook/GooglePlus	4	2,8%
Socrative	3	2,1%
Office 365 sway	2	1,4%
Scratch	1	0,7%
Quizworks	0	0,0%
AnkiDroid	0	0,0%
ED Puzzle	0	0,0%
Canva	0	0,0%
keine der genannten Methoden	18	12,6%
Summe Antworten	440	
Anzahl teilnehmende Lehrende, die die Frage beantwortet haben	143	
Anzahl teilnehmende Lehrende, die die Frage ausgelassen haben	0	

b.students

Methode	absolut	relativ bezogen auf Anzahl Personen
Von Lehrenden zur Verfügung gestellte digitale Inhalte von Dritten (zB. youtube, links, papers)	217	78,9%
Moodle Forum	207	75,3%
Selbst recherchierte digitale Inhalte von Dritten (zB. youtube, Wikipedia, sonstige websites, papers)	205	74,5%
Moodle-Test/Quiz	193	70,2%
Online Feedback (zB. auf Klausuren, Übungen, Projektarbeiten etc. via Moodle oder Office 365)	176	64,0%
Kollaboratives Arbeiten mit Office 365 Word/EXCEL/Powerpoint	145	52,7%
Klausuren am PC (außer Moodle Test)	139	50,5%
Lernvideos/Screencasts (vom/von der Lehrenden erstellt)	139	50,5%
Kahoot	136	49,5%
Vortrag mit Dokumentenkamera	127	46,2%
Quizlet	89	32,4%
Office 365 OneNote/Class Notebook	69	25,1%
Vortrag mit Tablet mit Stift	42	15,3%
Facebook/GooglePlus	31	11,3%
Moodle WIKI/Glossar	14	5,1%
Office 365 Sway	10	3,6%
Quizworks	9	3,3%
Socrative	8	2,9%
AnkiDroid	2	0,7%
Canva	2	0,7%
Scratch	1	0,4%
ED Puzzle	1	0,4%
keine der genannten Methoden	1	0,4%
Summe Antworten	1.963	
Anzahl teilnehmende Studierende, die die Frage beantwortet haben	275	
Anzahl teilnehmende Studierende, die die Frage ausgelassen haben	0	

<https://www.fnma.at/content/download/1738/7195>, p.21-22

15.8 TALIS 2018 comparison of teachers digital skills

Figure I.1.1 ICT for teaching

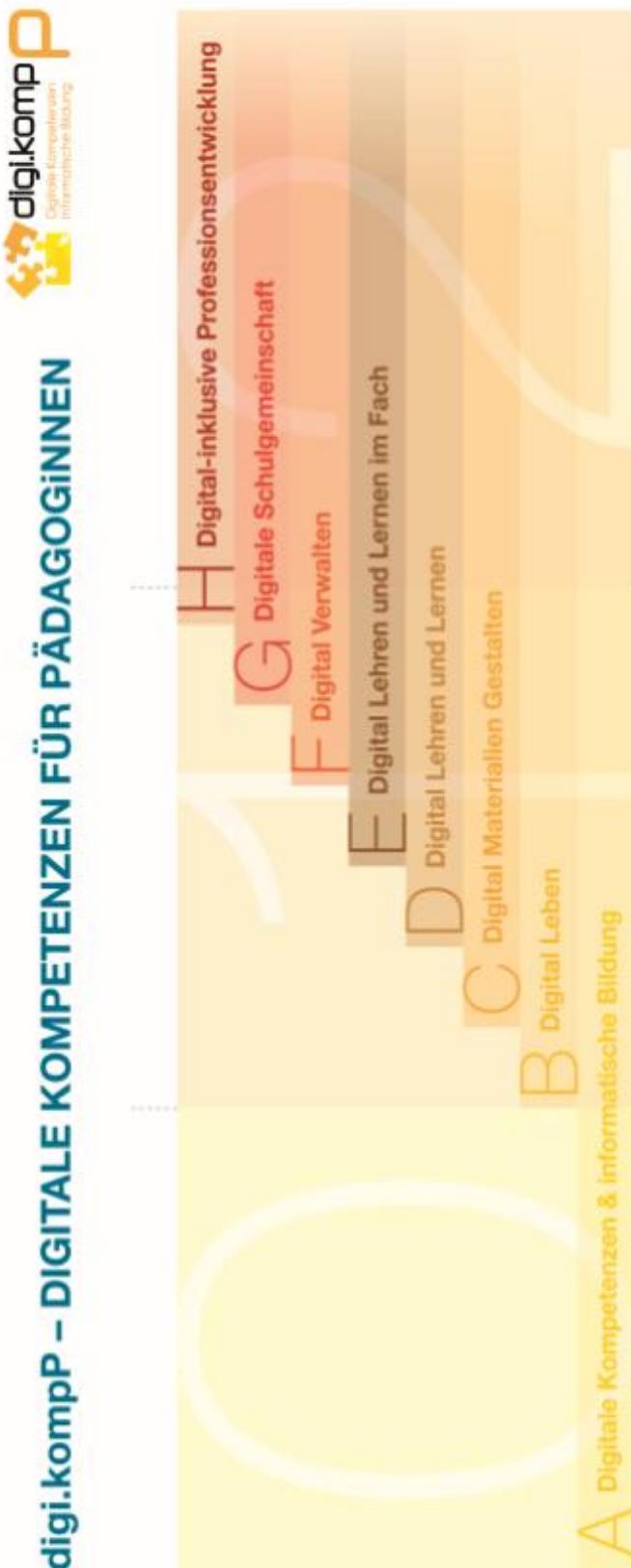
	Percentage of teachers for whom the "use of ICT for teaching" has been included in their formal education or training Chapter 4	Percentage of teachers who felt "well prepared" or "very well prepared" for the use of ICT for teaching Chapter 4	Percentage of teachers for whom "use of ICT for teaching" has been included in their recent professional development activities Chapter 5	Percentage of teachers reporting a high level of need for professional development in ICT skills for teaching Chapter 5	Percentage of teachers who "frequently" or "always" let students use ICT for projects or class work Chapter 2	Percentage of principals reporting shortage or inadequacy of digital technology for instruction Chapter 3
Alberta (Canada)	71	42	56	8	66	12
Australia*	65	39	67	11	78	12
Austria	40	20	46	15	33	18
Belgium	51	28	40	18	70	70
OECD average-31	56	43	60	18	53	25

* Participation rate of principals is too low to ensure comparability for principals' reports and country estimates are not included in the OECD average.

Source: OECD, TALIS 2018 Database, Tables I.4.13, I.4.13, I.5.18, I.5.21, I.2.1 and I.3.63.

StatLink  <http://dx.doi.org/10.1787/888933931791>

TALIS report, p.30



A Digitale Kompetenz und informative Bildung auf Maturaniveau und dessen laufende Aktualisierung	B Leben; Lehren und Lernen im Zischen der Digitalität; Fragen der Technikethik, Medienbildung und -biografie, Barrierefreiheit	C Gestalten, Verändern und Veröffentlichen von Unterrichten für den Unterricht; Rechtsfragen und damit verbundene Rechte und Erichten (Creative Commons, Werknutzung, Urheberrecht, OER)	D Planen; Durchführen und Evaluieren von Lehr- und Lernprozessen mit digitalen Medien und Lernumgebungen; formative und summative Beurteilung; Feedback; Sozialer Internet	E Fachspezifisch förderlicher Einsatz von Content, Software, Medien und Werkzeugen	F Elterntexter und verantwortungsvoller Umgang mit SchülerInnenstellen; digitales Klassenbuch, Schülertagungswartung	G Kommunikation und Kooperation in der Schulgemeinschaft und über die Schulgemeinschaft hinaus	H Die eigene Fort- und Weiterbildung im Modus und im Bereich des Digitalen
0 vor dem Studium	1 während des Studiums	2 während der ersten fünf Praxsjahre					

Tabelle 1: Übersicht digi.compP

Lizenz: CC BY-SA 4.0 | Lizenz: Creative und Illustrationen: www.nbl-conflict.cc BY-NC-ND
Version 1.0, Stand: Juni 2018
Orientierungskampus Virtuelle PH, Thanner Alten Elektoren-Straße 1, 7000 Eisenstadt, www.virtuelle-ph.at



15.10 Austrian Studies about skills demand (IBW, orig.abstracts)

(1) Fachkräfteteradar 2018. ibw-Forschungsbericht Nr. 191 | ibw-Forschungsbericht Nr. 192, Wien, 2018, Dornmayr H., Winkler B. <https://ibw.at/resource/download/1694/ibw-researchbrief-101-en.pdf>

The skilled labour shortage is already being felt by almost all Austrian companies (87%) in the spring/early summer of 2018, it increases the workload on entrepreneurs and current staff, it compromises the quality of service provision and the satisfaction of customers, and additionally leads to a clear decline in the economic success of Austrian companies (drops in sales and higher costs). The skilled labour shortage is experienced particularly intensely in medium-sized companies, in tourism, in artisanal/technical fields and in the west of Austria. At the level of formal qualifications, it is mainly apprenticeship graduates who are urgently sought.

With the "Skilled Workers Radar" (Part I: Key Indicators, Part II: Company Survey), well-founded instruments are now available to analyse the skilled labour shortage in Austria, comprising both comprehensive secondary statistical analyses and an Austria-wide survey of around n = 4,500 companies.

(2) Skills for the Future. Zukünftiger Qualifizierungsbedarf aufgrund erwarteter Megatrends. Analysen und Befunde auf Basis der IV-Qualifikationsbedarfserhebung 2016. ibw-Forschungsbericht Nr. 187, Wien, 2016, Schmid K., Winkler B., Gruber B.
<https://ibw.at/resource/download/1006/ibw-researchbrief-96-en.pdf>

Megatrends such as Industry 4.0, globalisation, demography (aging, migration) are lasting sources of changing requirements for activities and, as a consequence, also competences of employees. Essentially it is a matter of an increase in the significance of higher qualified activities: this means broader and more complex ranges of tasks, increased implementation in teamwork/project work arrangements (and, as a consequence, an increasing significance of soft skills) and also more extensive know-how about company-based processes. The effects of the megatrends are particularly relevant for the middle level of skilled labour (employees with an apprenticeship, technical vocational school or college qualification).

Many companies consider themselves/their employees to be not sufficiently qualified with regard to the developments initiated by Industry 4.0 and globalisation/internationalisation.

(3) Welche Berufe brauchen wir in Zukunft? ibw-aktuell, Wien, 2013, Schneeberger A.
<https://ibw.at/resource/download/1205/ibw-aktuell-welche-berufe-brauchen-wir-in-zukunft.pdf>

Zusammenfassung (only German)

Der berufliche Wandel schafft Jobs auf allen Qualifikationsniveaus und belegt damit unterschiedlichen Qualifikationsbedarf. Auch in Zukunft werden rund 80 Prozent der Jobs mit beruflicher Aus- und Weiterbildung zugänglich sein: Dies reicht von betrieblicher Einarbeitung (nach solider Pflichtschulbildung) über Lehre oder Fachschule bis zur BHS oder zur Meisterprüfung.

Im Spitzensfeld der mittelfristig stark wachsenden Berufe finden sich beispielsweise „Verkaufsberufe“ sowie „Verkaufs-, Dienstleistungshilfskräfte“. Wachstum *in der Absolutzahl unselbstständig Beschäftigter* wird damit für alle Qualifikationsniveaus (Skill levels) mittelfristig prognostiziert.

Empirische Evidenz hierfür bietet die Liste mit den zehn im Zeitraum 2010 bis 2016 voraussichtlich **am stärksten wachsenden Berufen**:

Pflege- und verwandte Berufe
Krankenpflege-, Geburtshilfefachkräfte
Produktions-, OperationsleiterInnen
Verkaufsberufe
Verkaufs-, Dienstleistungshilfskräfte
Technische Fachkräfte
Dienstleistungsberufe in Gastronomie und Tourismus
NaturwissenschaftlerInnen
Biowissenschafter-, MedizinerInnen
ArchitektInnen, IngenieurInnen

Das Thema „Fachkräftemangel“ wird uns voraussichtlich mittelfristig erhalten bleiben. Alleine durch die Verluste durch Geburtenrückgang und veränderte Bildungswahl sind bei stabiler und zum Teil wachsender Beschäftigung dauerhafte Rekrutierungsprobleme auf Lehrabschlussebene zu erwarten.

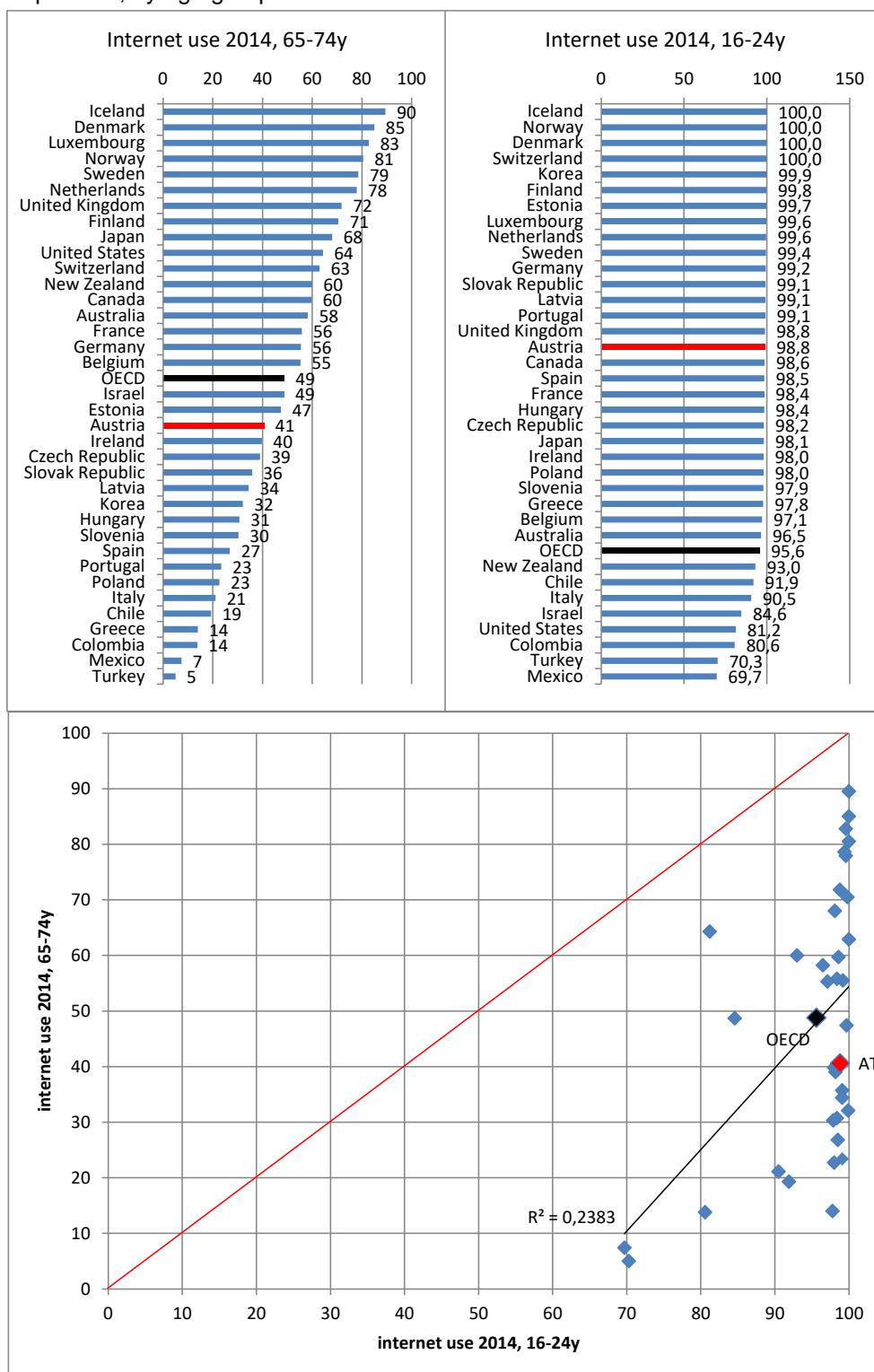
Die aktuelle Hochschulabsolventen/innenquote belief sich laut OECD im Jahr 2010 bei den unter 30-Jährigen in Österreich auf 25 Prozent. Klagen über „Technikermangel“ einerseits und „prekäre Beschäftigung“ andererseits werden den öffentlichen Diskurs voraussichtlich weiterhin begleiten. Hauptprobleme am Akademikerarbeitsmarkt dürften fachliches Mismatch und hohe regionale Mobilitätsanforderungen auf einem international erweiterten Arbeitsmarkt für Graduierte bleiben. Auch in Österreich sollte es zu einer weiteren Verbreiterung der Berufseinmündung Neugraduierter außerhalb der traditionellen akademischen Berufe kommen.

Trend und Prognose belegen, dass sich die seit Langem gehegte Vorstellung, Wachstum der wissensbasierten Dienstleistungsökonomie würde primär Jobs auf höherem Qualifikationsniveau schaffen, als wenig realistisch oder zumindest einseitig erweist. Solide Pflichtschulbildung für alle und berufliche Aus- und Weiterbildung sind bei sinkenden Geburtenzahlen und von zum Teil wenig bildungsaffiner Bevölkerungsgruppen wichtiger denn je. Internationale Rekrutierung und die Nachqualifizierung von Erwachsenen werden daher auch auf Fachkräfteebene weiterhin forciert werden müssen.

15.11 OECD Innovation data

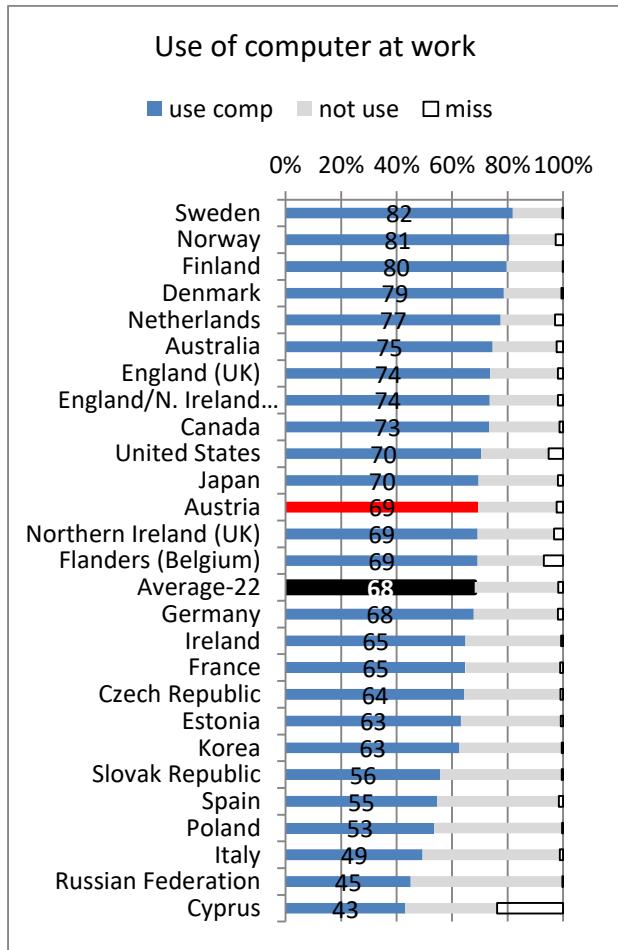
15.11.1 Internet use and skills for job and problem solving

Population, by age groups



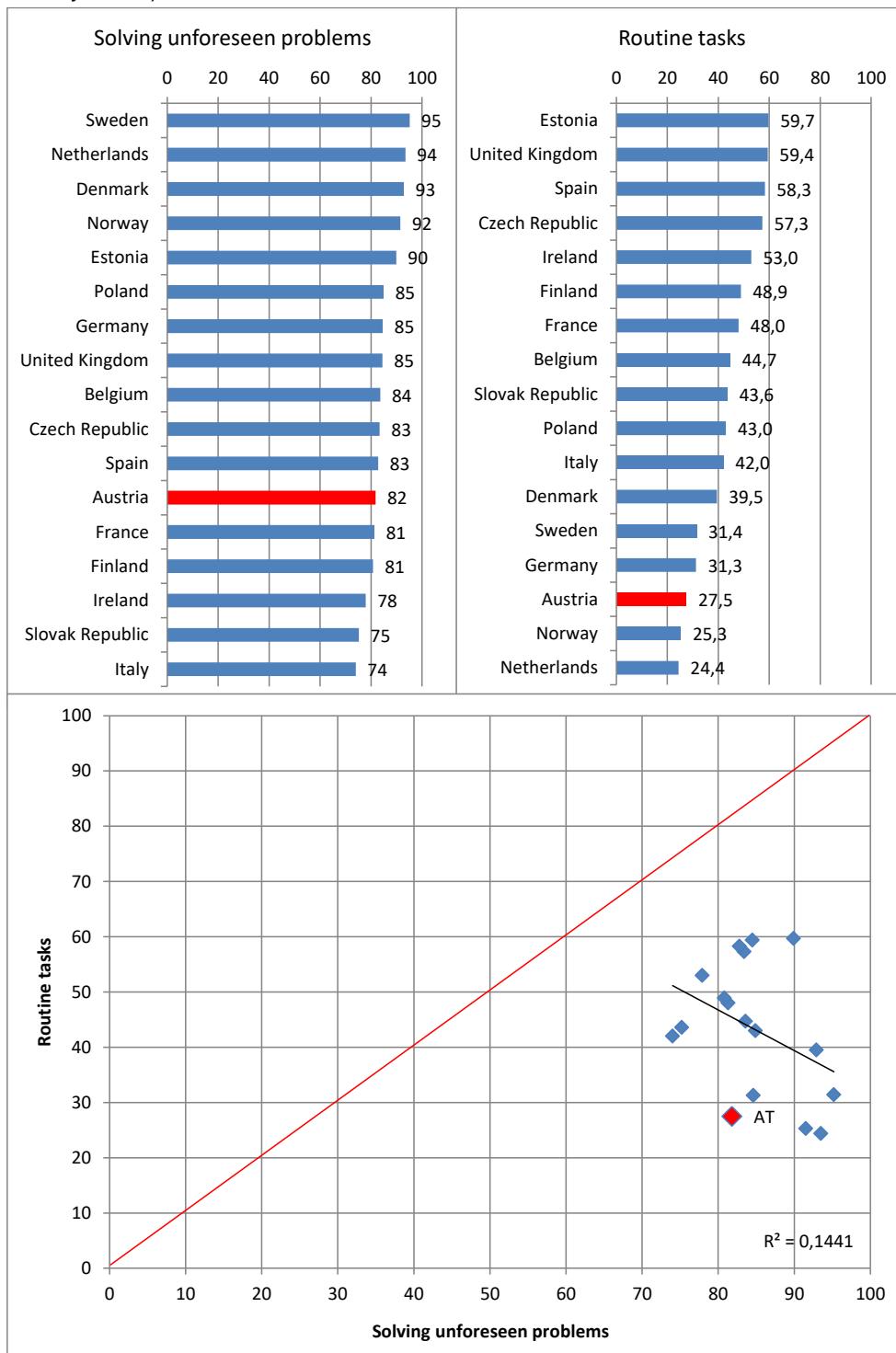
OECD Digital Economy Outlook 2015, Chapter 3. The growing and expanding digital economy

Use of computer at work



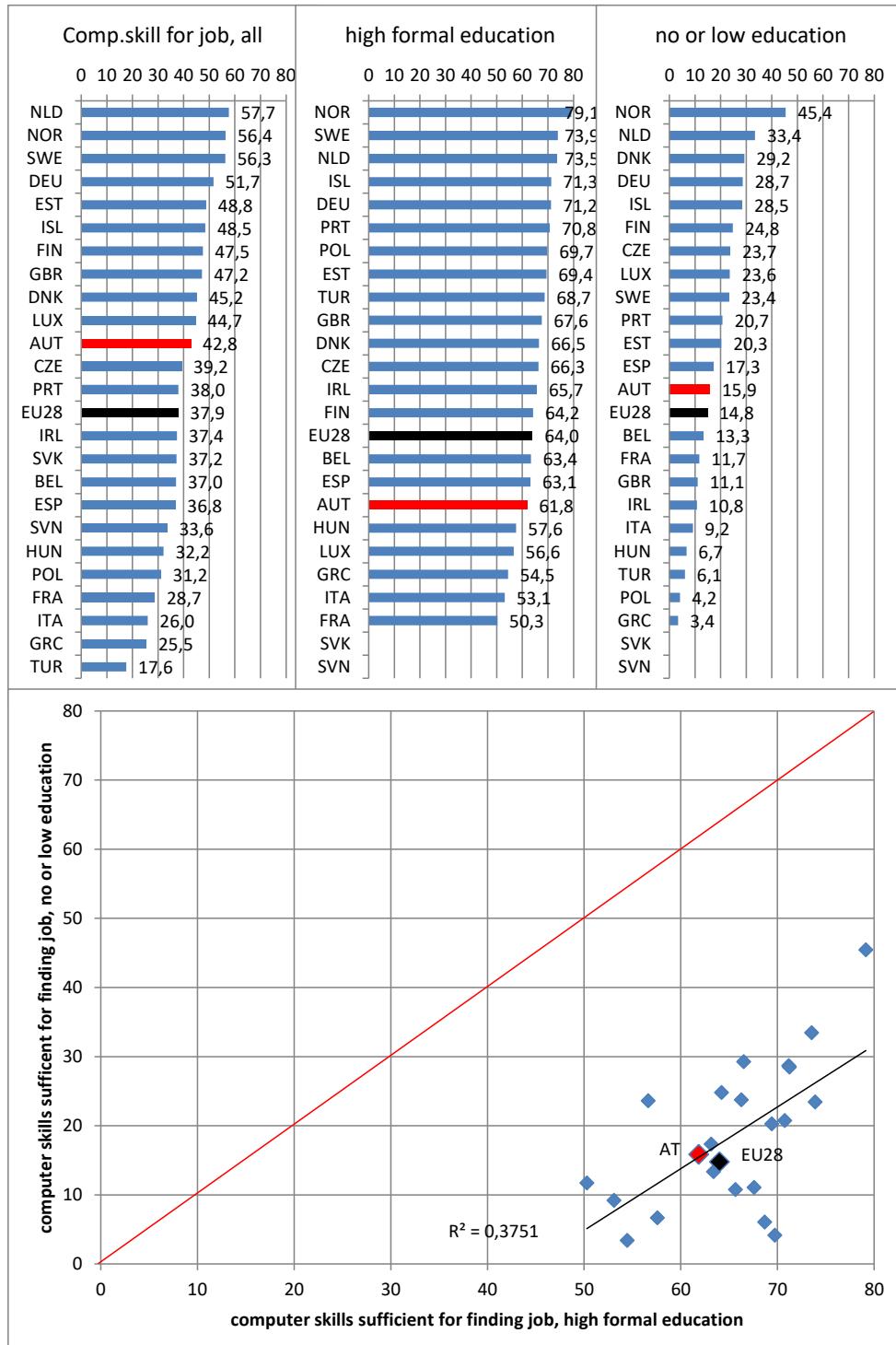
Adults, Computers and Problem Solving – 4, Table A4.2f Use of a computer at work

Demand: jobs with solving unforeseen problems, jobs with routine tasks (European Working Conditions Survey, 2010).



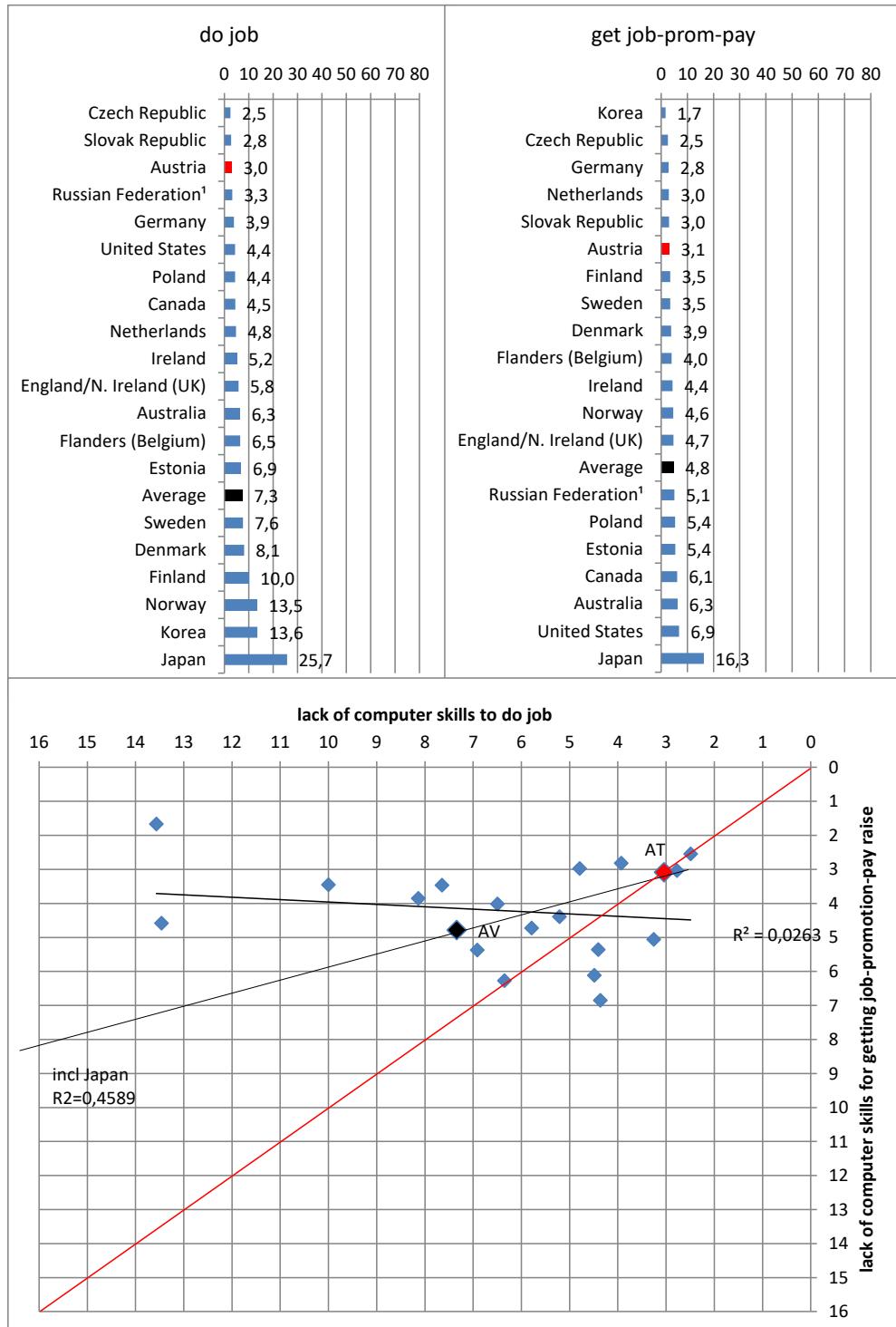
Adults, Computers and Problem Solving – 1, Figure 1.1 Jobs involving routine tasks or solving unforeseen problems

Sufficient computer skills for finding job, all, education



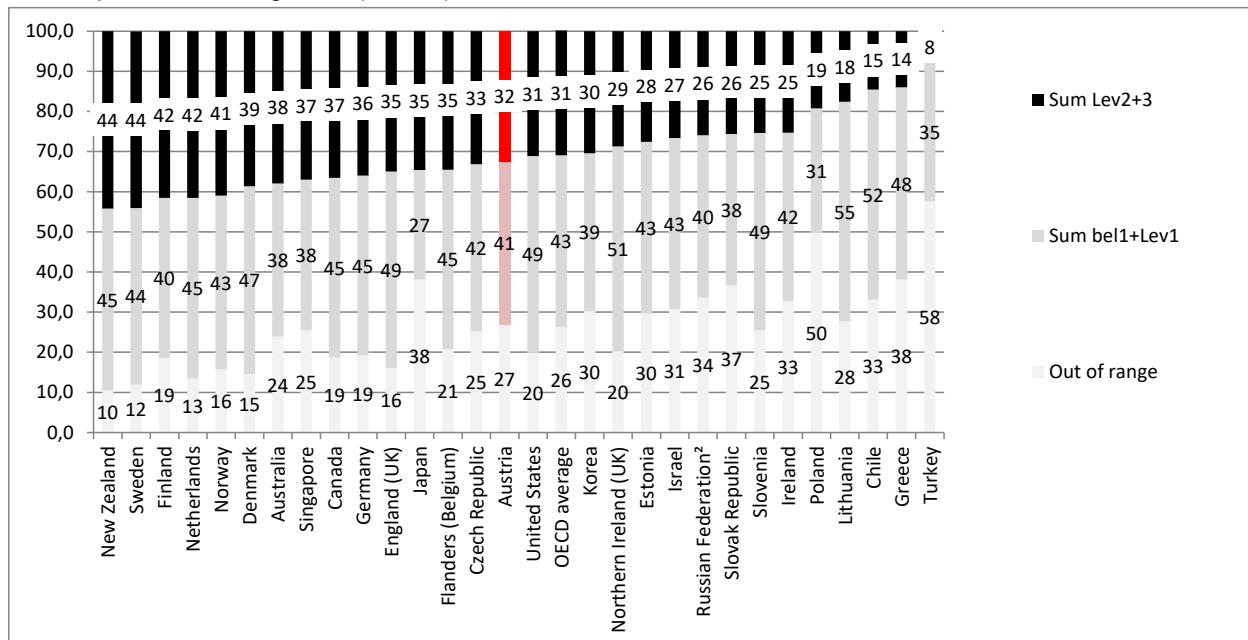
Measuring the Digital Economy: A New Perspective - Chapter 3, Individuals who judge their computer skills to be sufficient if they were to apply for a new job within a year, 2013

Lack of computer skills and job



Adults, Computers and Problem Solving – 4, Figure 4.4 Workers who reported insufficient computer skills

Adults, problem solving skills (PIAAC)



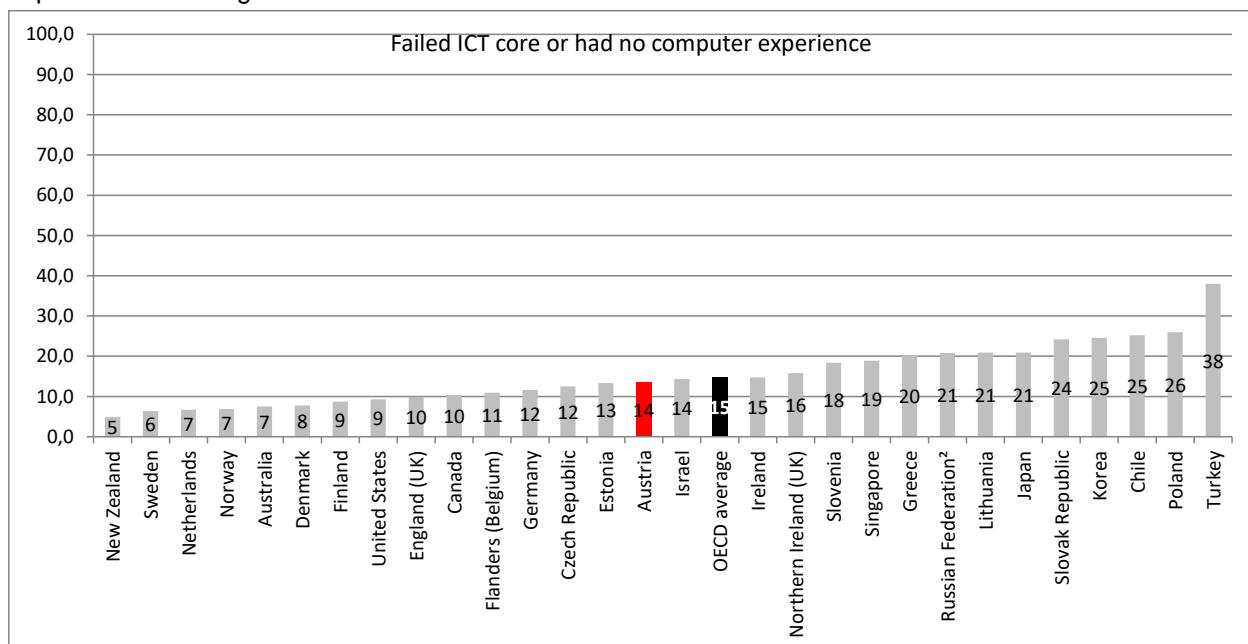
Skills Matter: Further Results from the Survey of Adult Skills – 2, Figure 2.16 Proficiency in problem solving in technology-rich environments among adults

Remark:

2+3 good skills

1+below1 lack of skills

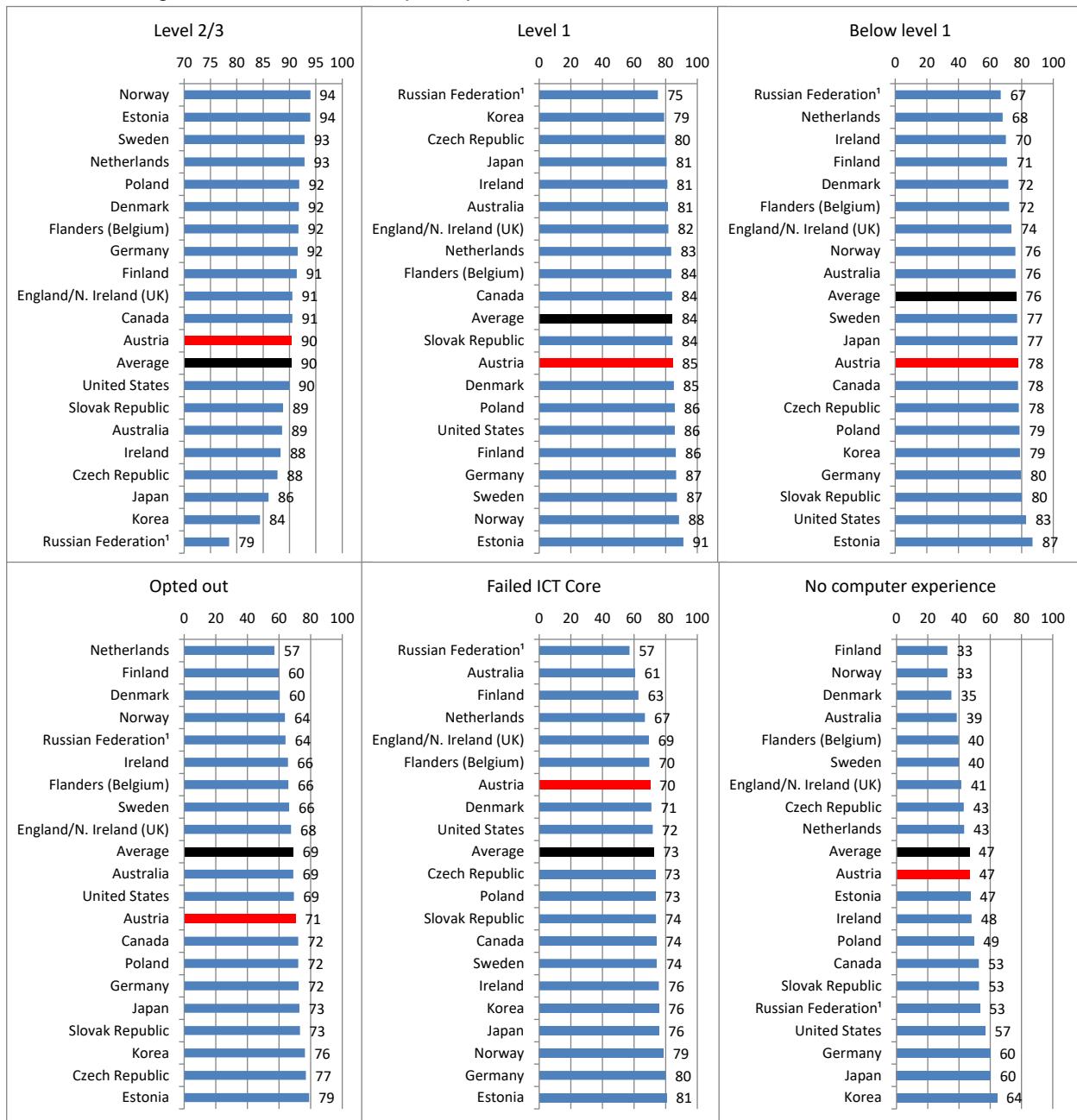
"Out of range" = Opted out of the computer based assessment + Failed ICT core or had no computer experience +Missing



Table, adult problem solving skills, detailed

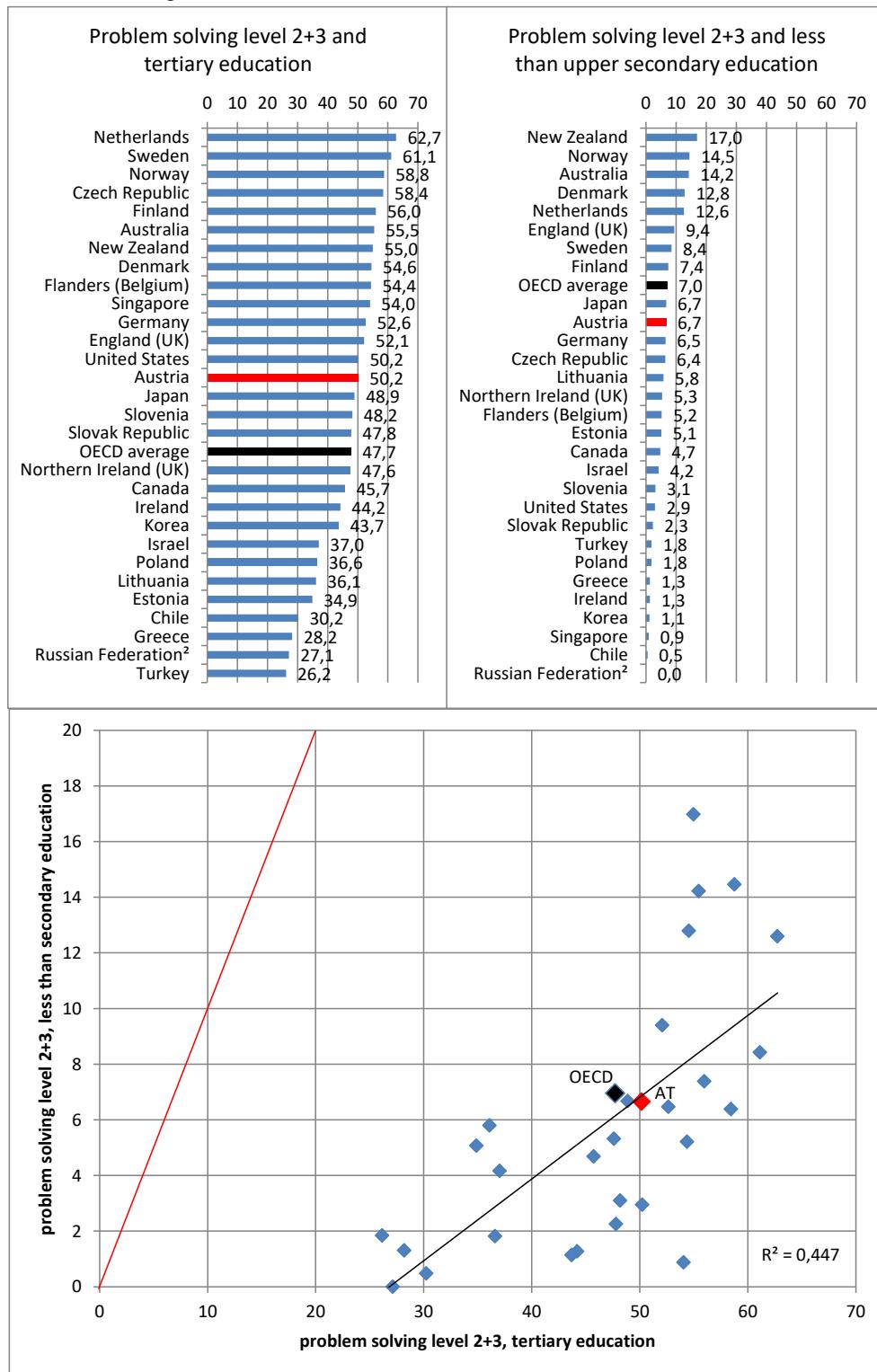
	Below Level 1	Level 1	Level 2	Level 3	Opted out of the computer based assessment	Failed ICT core or had no computer experience	Missing
New Zealand	14,7	30,6	34,0	10,2	3,4	4,9	2,1
Sweden	13,1	30,8	35,2	8,8	5,7	6,4	
Finland	11,0	28,9	33,2	8,4	9,7	8,7	0,1
Netherlands	12,5	32,6	34,3	7,3	4,5	6,7	2,3
Norway	11,4	31,8	34,9	6,1	6,7	6,9	2,2
Denmark	13,9	32,9	32,3	6,3	6,4	7,8	0,4
Australia	9,2	28,9	31,8	6,2	13,7	7,5	2,7
Singapore	12,5	25,1	29,3	7,7	5,5	18,9	1,1
Canada	14,8	30,0	29,4	7,1	6,3	10,4	1,9
Germany	14,4	30,5	29,2	6,8	6,1	11,6	1,5
England (UK)	15,1	33,8	29,3	5,7	4,6	9,9	1,6
Japan	7,6	19,7	26,3	8,3	15,9	20,9	1,3
Flanders (Belgium)	14,8	29,8	28,7	5,8	4,7	10,9	5,2
Czech Republic	12,9	28,8	26,5	6,6	12,1	12,5	0,6
Austria	9,9	30,9	28,1	4,3	11,3	13,7	1,8
United States	15,8	33,1	26,0	5,1	6,3	9,3	4,3
OECD average	14,2	28,7	25,7	5,4	9,6	14,7	1,9
Korea	9,8	29,6	26,8	3,6	5,4	24,6	0,3
Northern Ireland (UK)	16,4	34,5	25,0	3,7	2,3	15,8	2,2
Estonia	13,8	29,0	23,2	4,3	15,8	13,3	0,5
Israel	18,4	24,3	20,3	6,4	12,7	14,3	3,7
Russian Federation ²	14,9	25,6	20,4	5,5	12,8	20,8	
Slovak Republic	8,9	28,8	22,8	2,9	12,2	24,2	0,3
Slovenia	21,4	27,7	21,6	3,7	6,3	18,4	0,8
Ireland	12,6	29,5	22,1	3,1	17,4	14,7	0,6
Poland	12,0	19,0	15,4	3,8	23,8	26,0	
Lithuania	25,5	29,2	15,6	2,1	2,3	20,9	4,5
Chile	26,8	25,6	12,4	2,1	7,5	25,2	0,4
Greece	22,4	25,5	11,5	2,5	11,2	20,2	6,7
Turkey	15,9	18,6	6,9	0,9	17,7	38,0	2,0

Problem solving skills and labour force participation



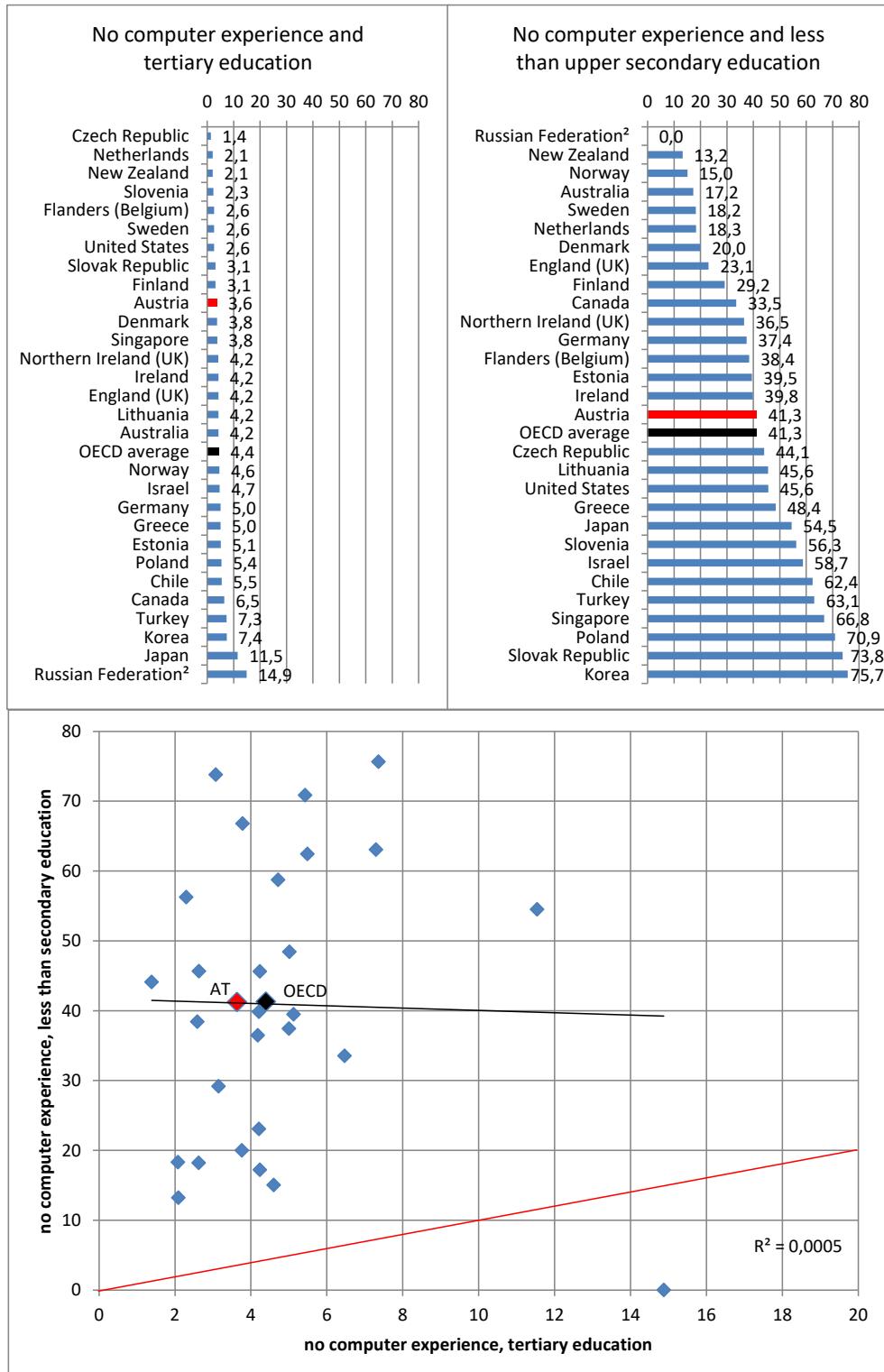
Adults, Computers and Problem Solving – 4, Figure 4.6 Labour force participation, by problem-solving proficiency

Problem solving skills and education



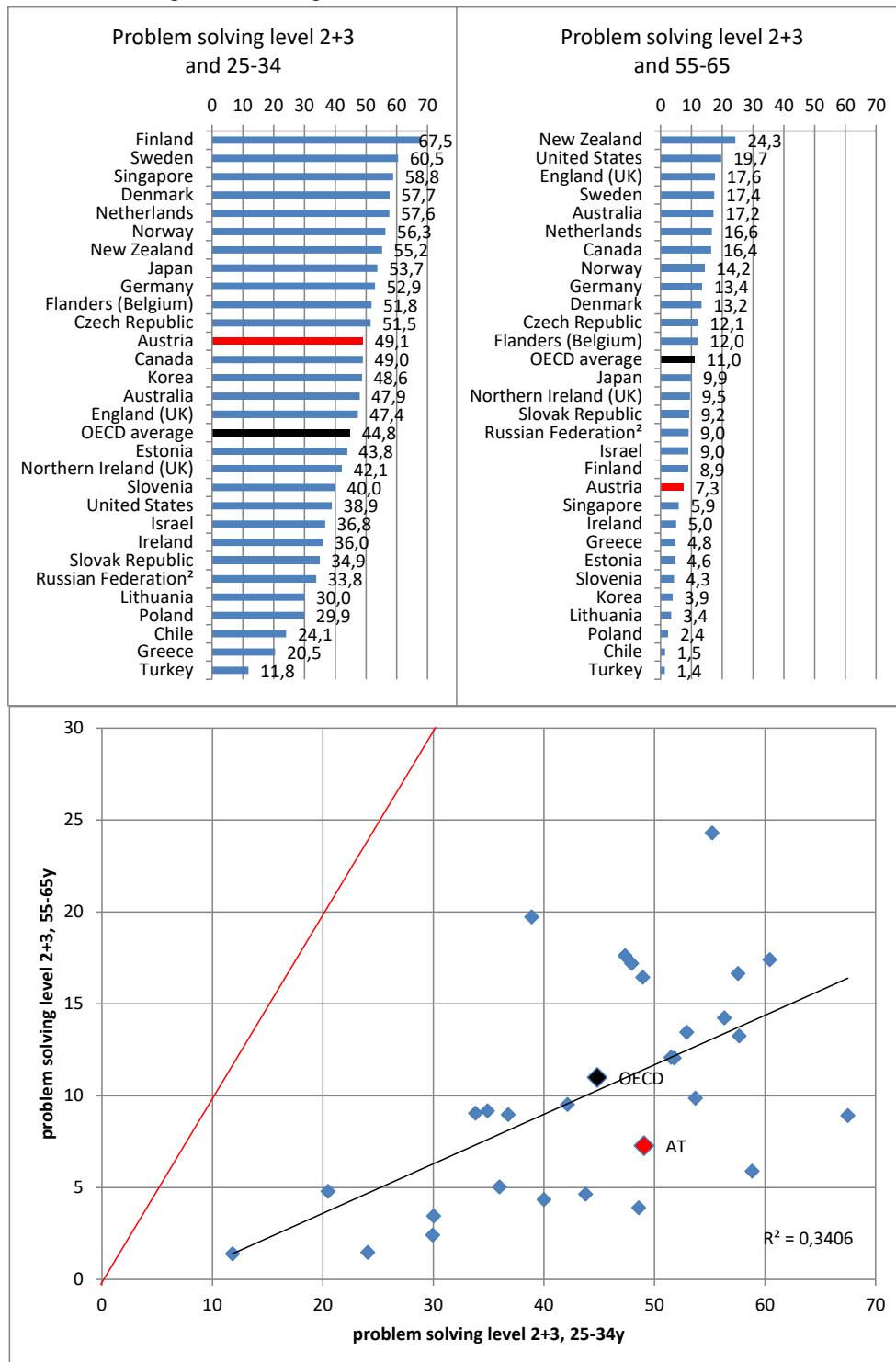
Skills Matter: Further Results from the Survey of Adult Skills – 3, Figure 3.3 Problem-solving proficiency, by educational attainment

No computer experience and education



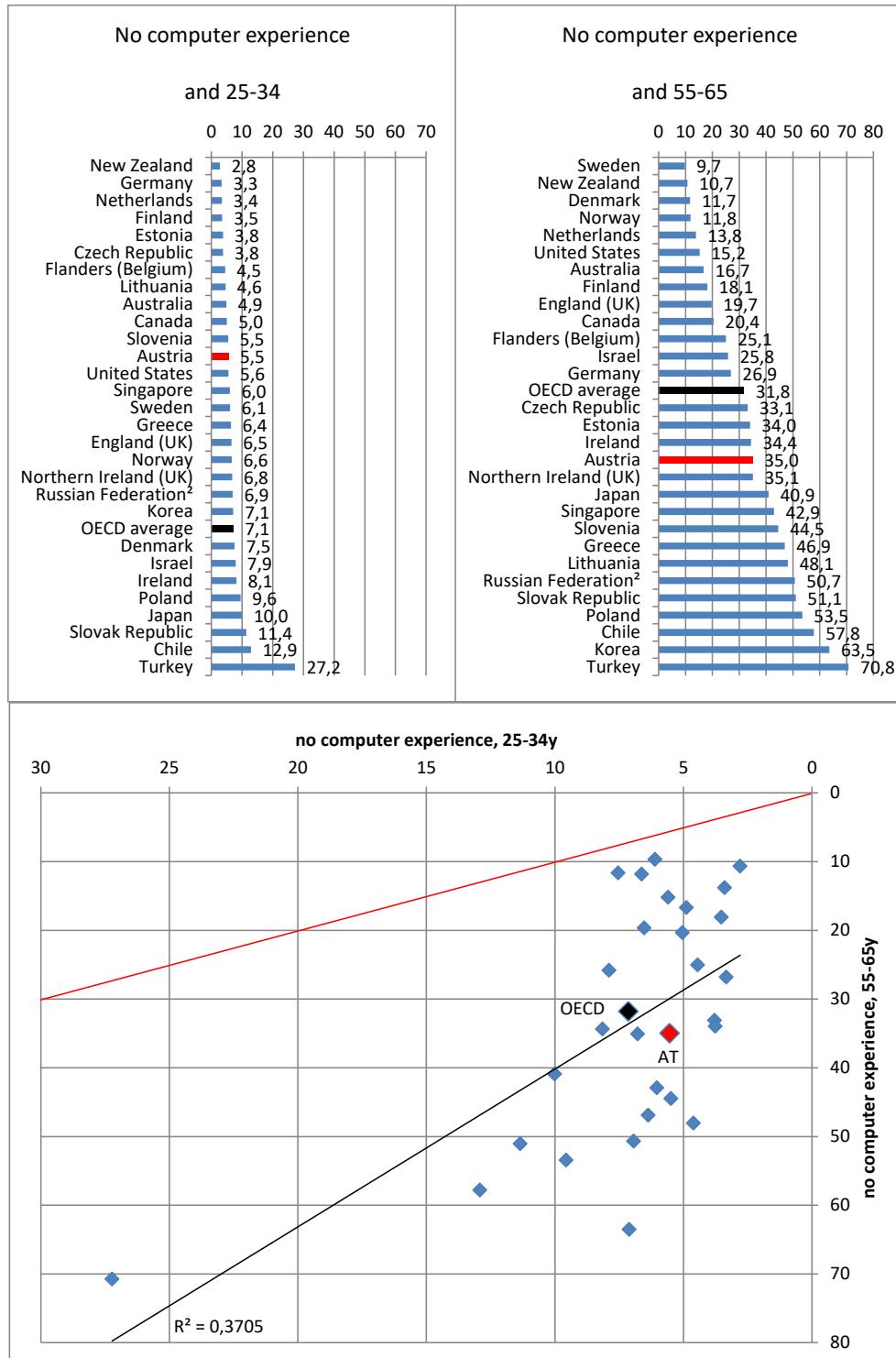
Skills Matter: Further Results from the Survey of Adult Skills – 3, Figure 3.3 Problem-solving proficiency, by educational attainment

Problem solving skills and age



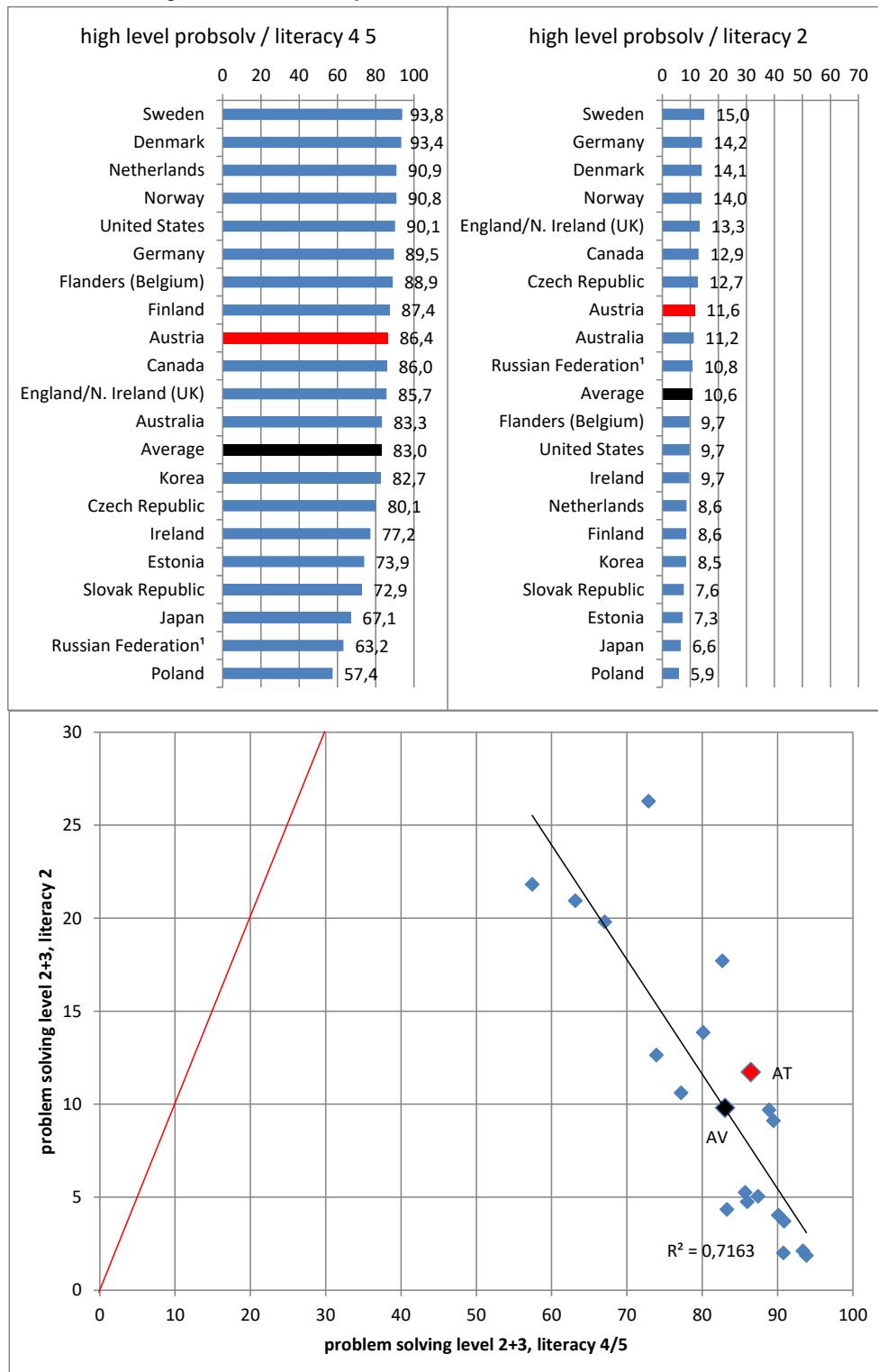
Skills Matter: Further Results from the Survey of Adult Skills – 3, Figure 3.8 Problem-solving proficiency among younger and older adults

No computer experience and age



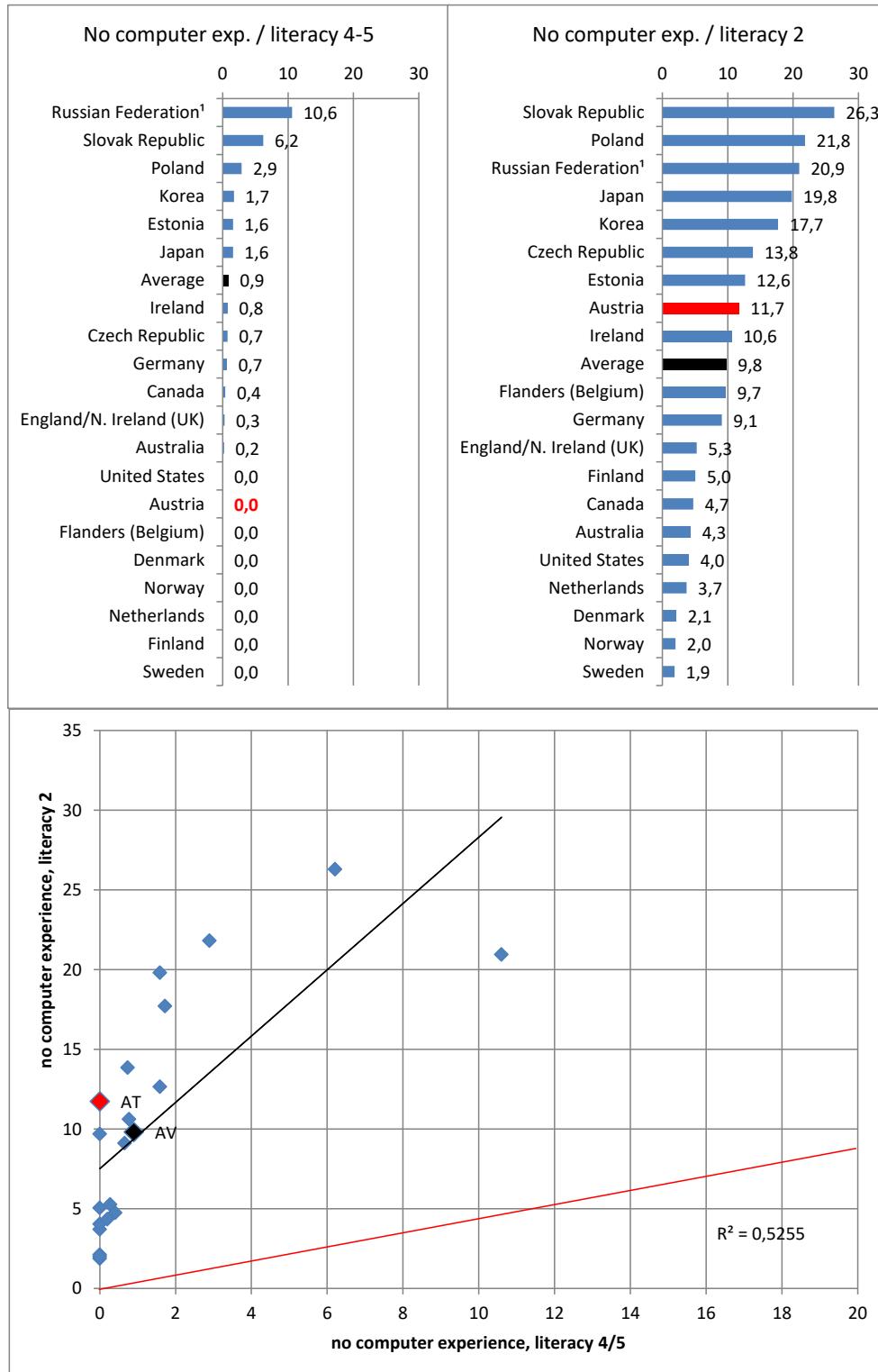
Skills Matter: Further Results from the Survey of Adult Skills – 3, Figure 3.8 Problem-solving proficiency among younger and older adults

Problem solving skills and literacy



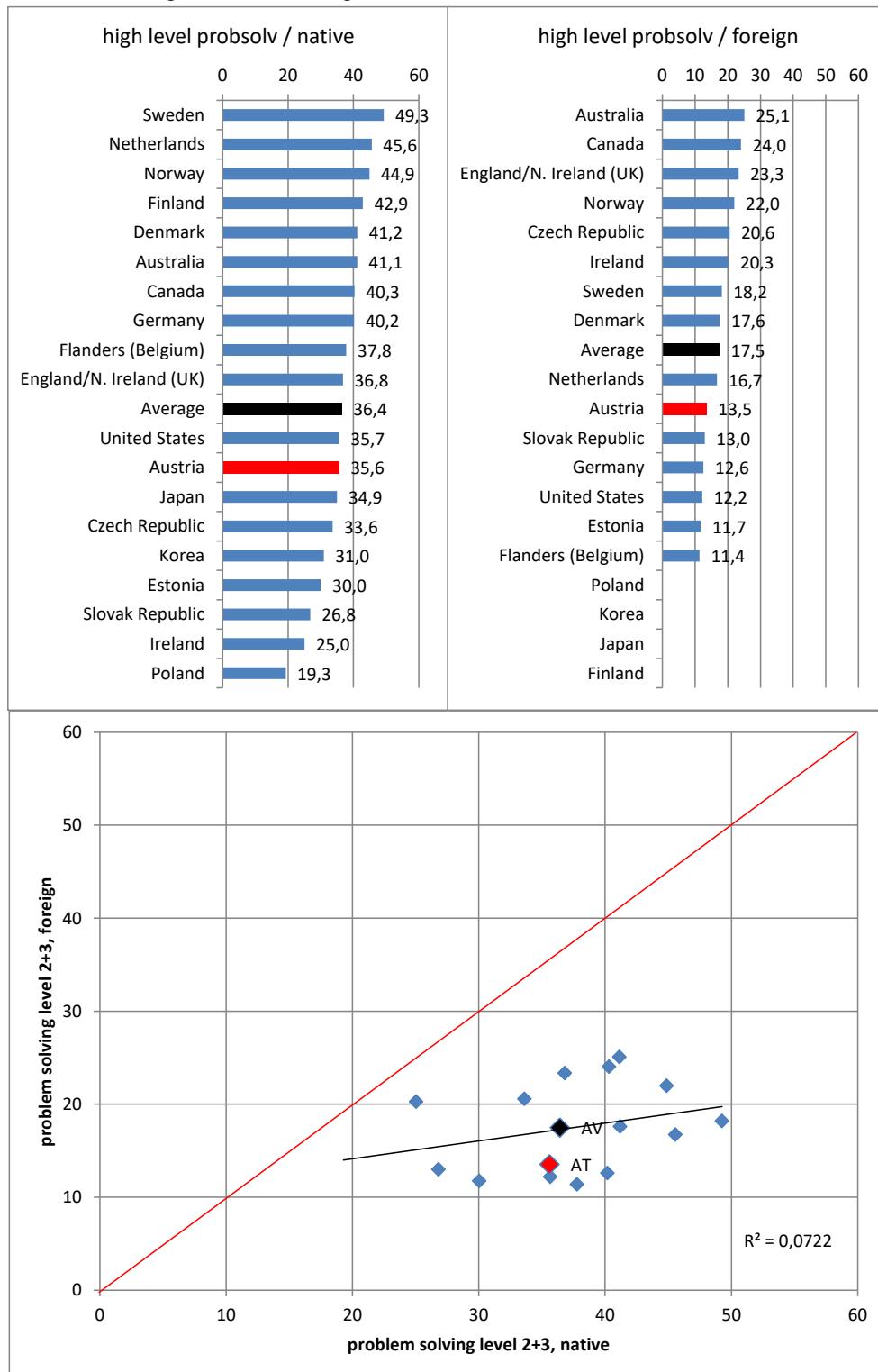
Adults, Computers and Problem Solving – 3, Figure 3.7 Problem-solving proficiency and computer experience, by level of literacy proficiency

No computer experience and literacy



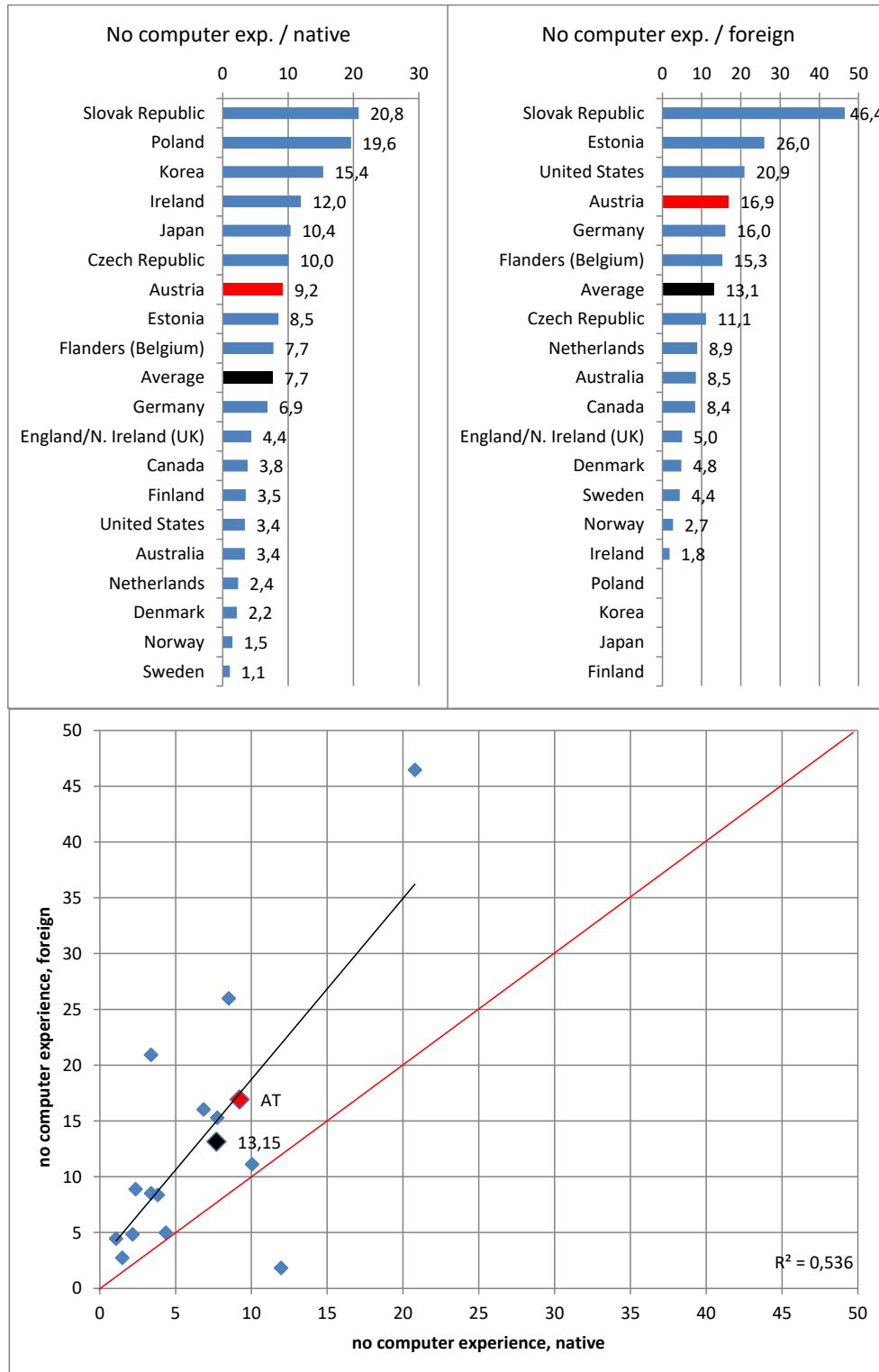
Adults, Computers and Problem Solving – 3, Figure 3.7 Problem-solving proficiency and computer experience, by level of literacy proficiency

Problem solving skills and immigration



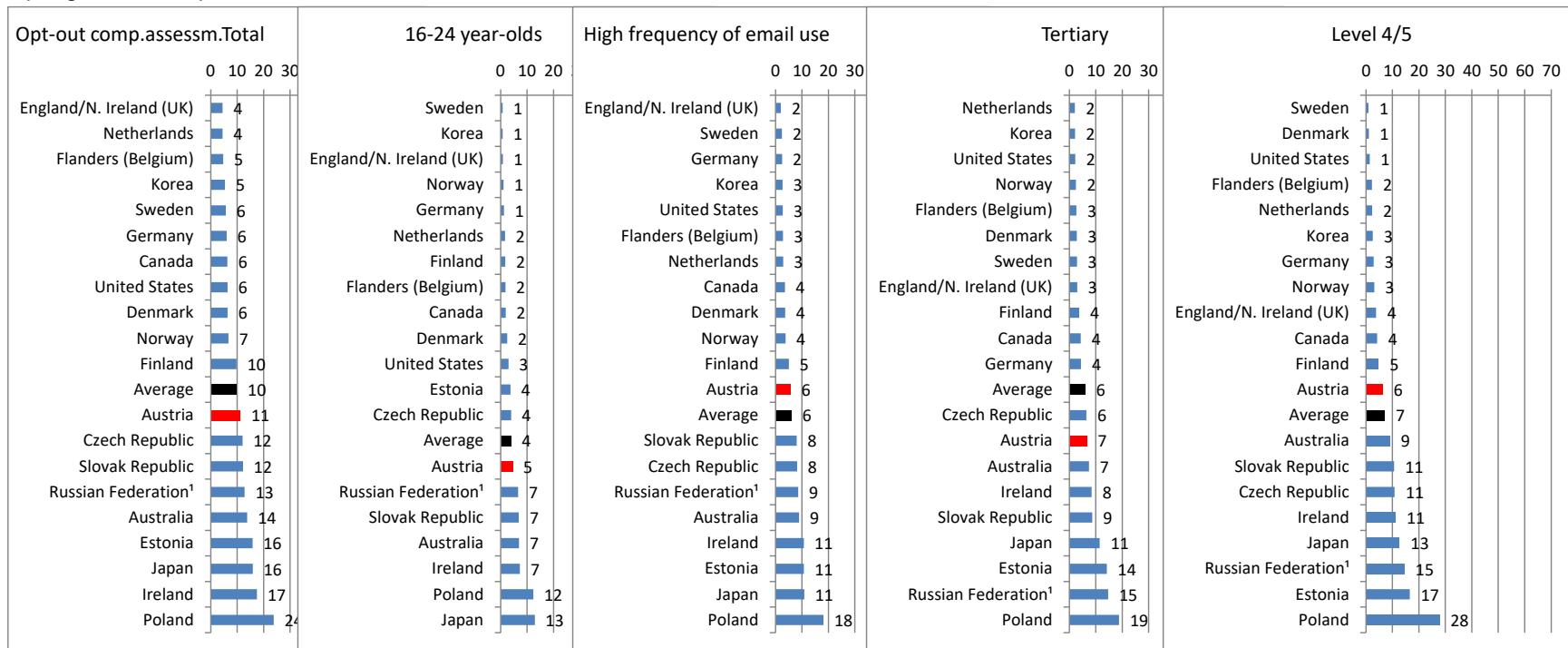
Adults, Computers and Problem Solving – 3, Figure 3.6 Problem-solving proficiency and computer experience, by immigrant and language status

No computer experience and immigration



Adults, Computers and Problem Solving – 3, Figure 3.6 Problem-solving proficiency and computer experience, by immigrant and language status

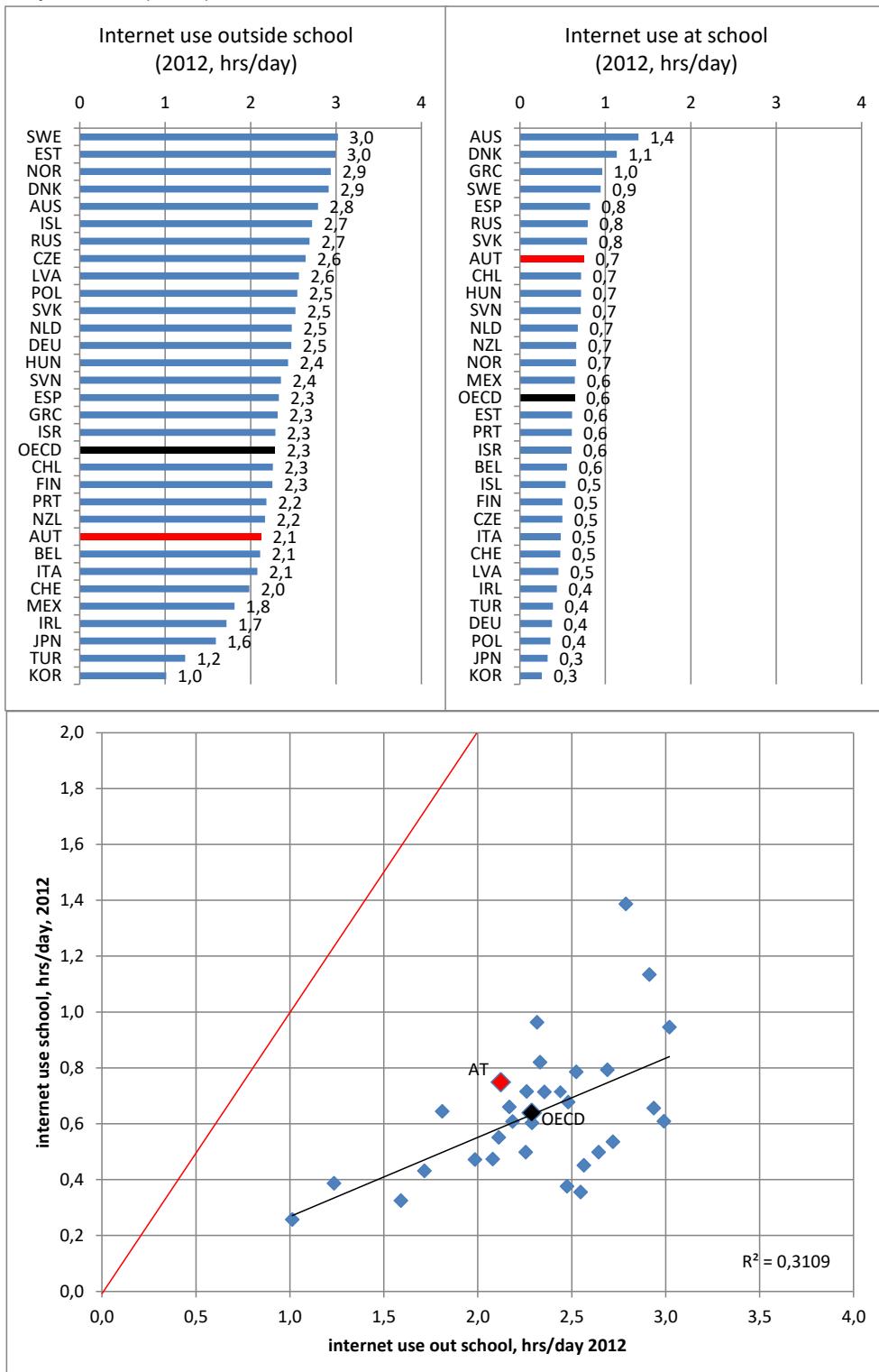
Opting out of computer based assessment in PIAAC



Adults, Computers and Problem Solving - Box 2.1 - Figure 2.a Percentage of adults who opted out of taking the computer-based assessment, by various characteristics

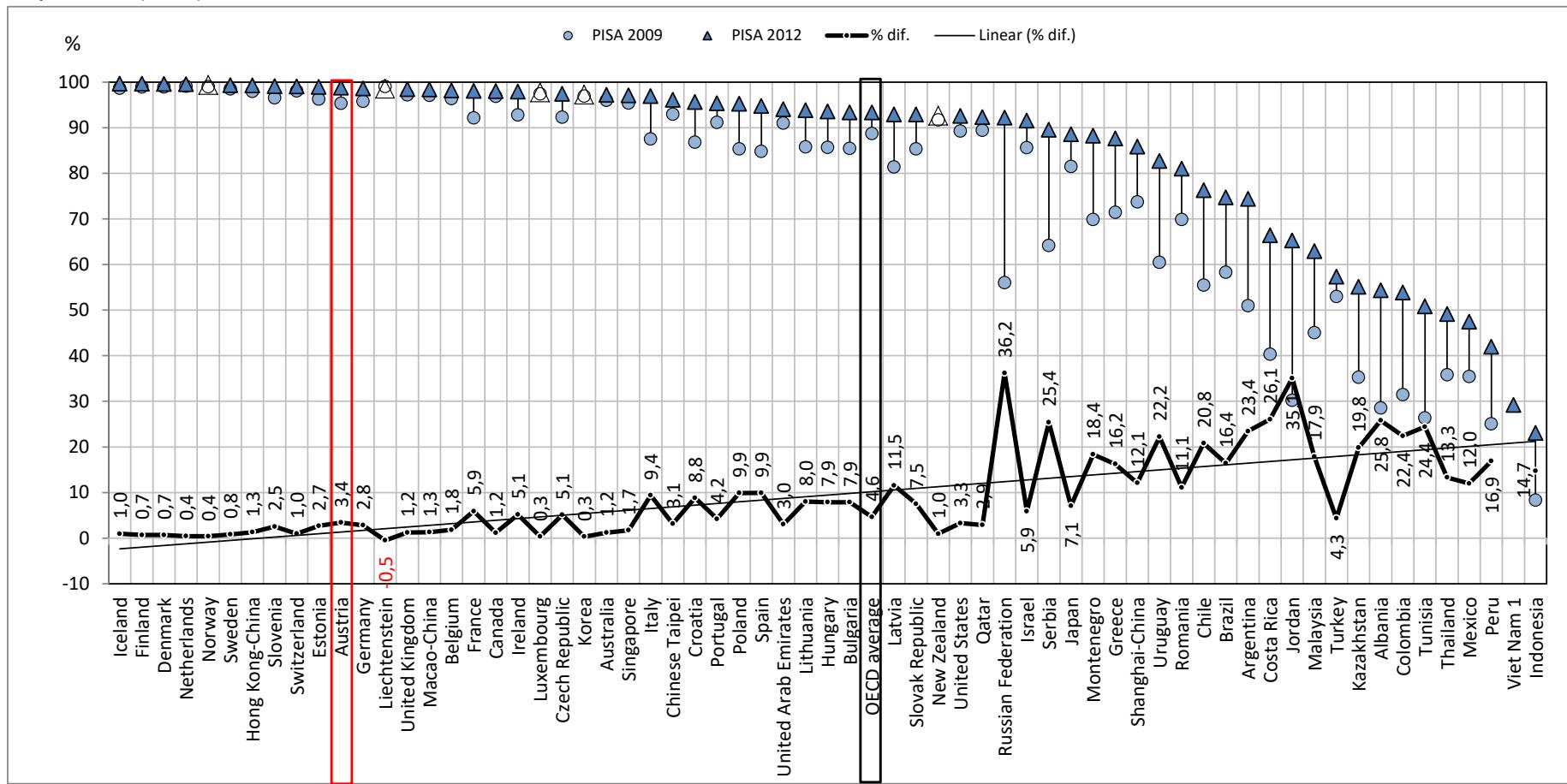
15.11.2 Internet use and access of 15 year olds

15 year olds (PISA), inside-outside school, hours



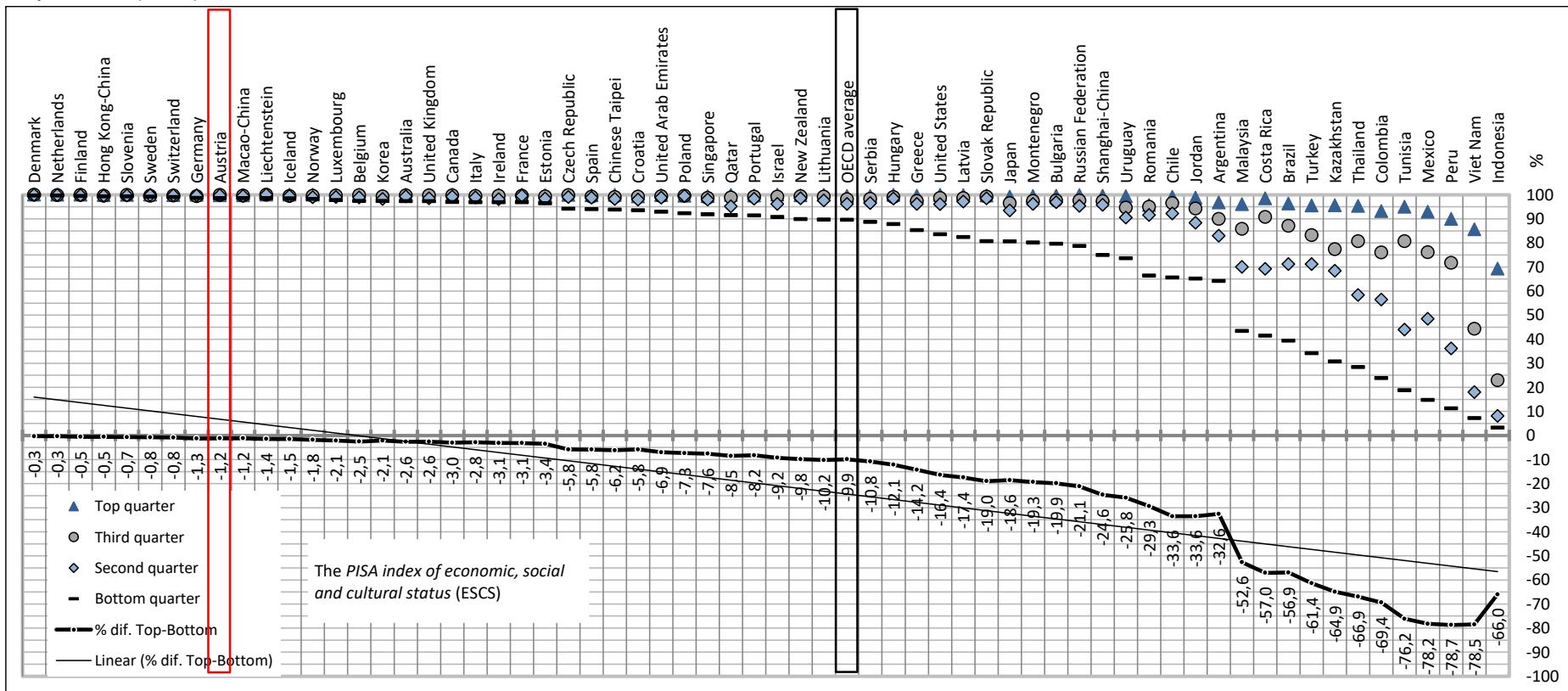
Measuring the Digital Economy: A New Perspective - Chapter 3

15 year olds (PISA), access at home 2009 and 2012



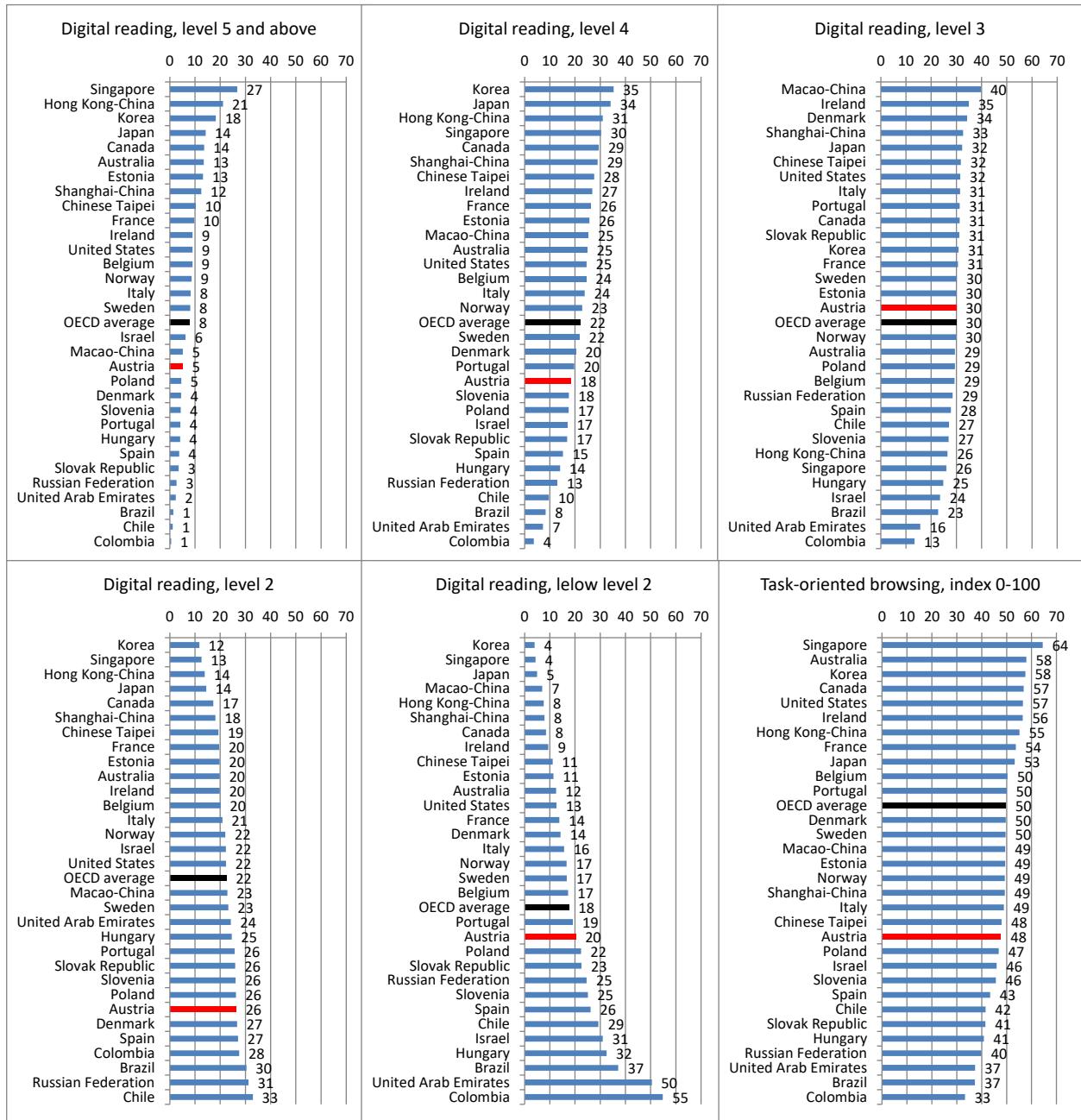
Students, Computers and Learning: Making the Connection - Chapter 1, Figure 1.2. Change between 2009 and 2012 in Internet access at home

15 year olds (PISA), access at home, socioeconomic status



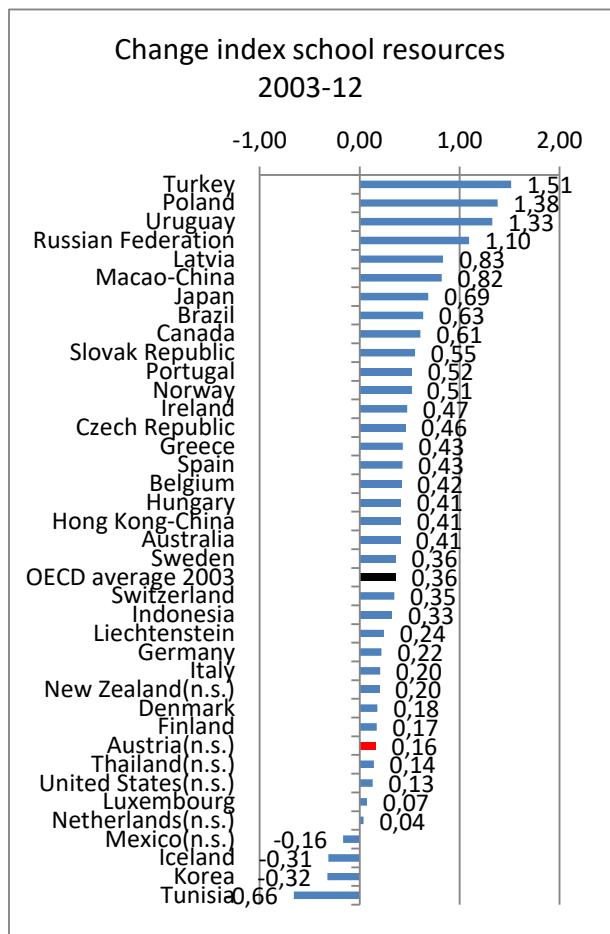
Students, Computers and Learning: Making the Connection - Chapter 5, Figure 5.1. Access to computers at home and students' socio-economic status

15 year olds, digital reading and task-oriented browsing (PISA)



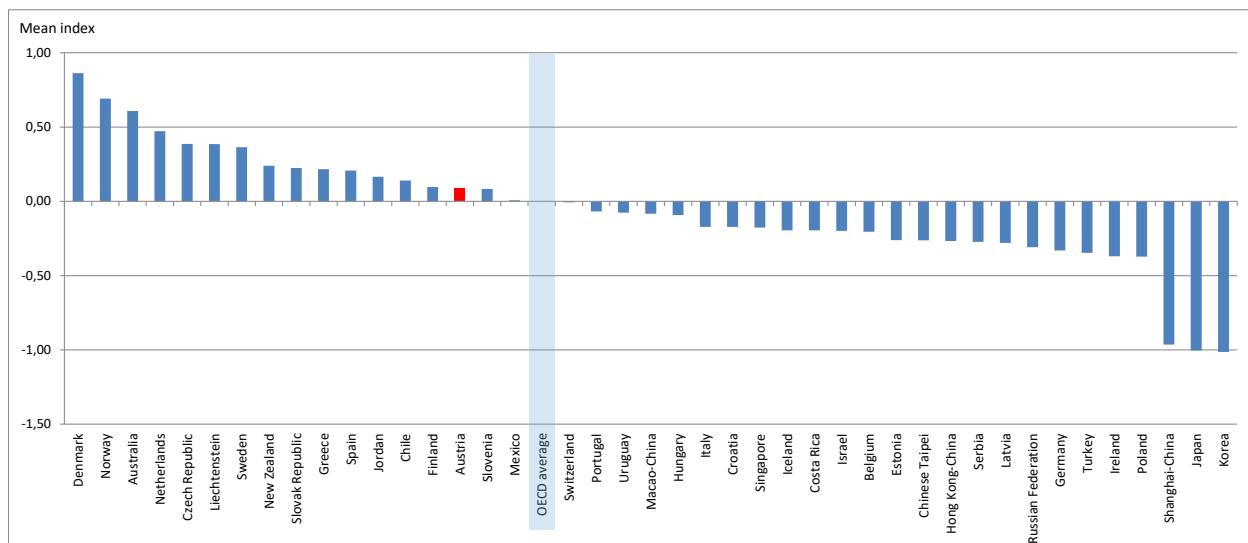
Students, Computers and Learning: Making the Connection - Chapter 3, Figure 3.5. Proficiency in digital reading

15.11.3 School resources, innovation



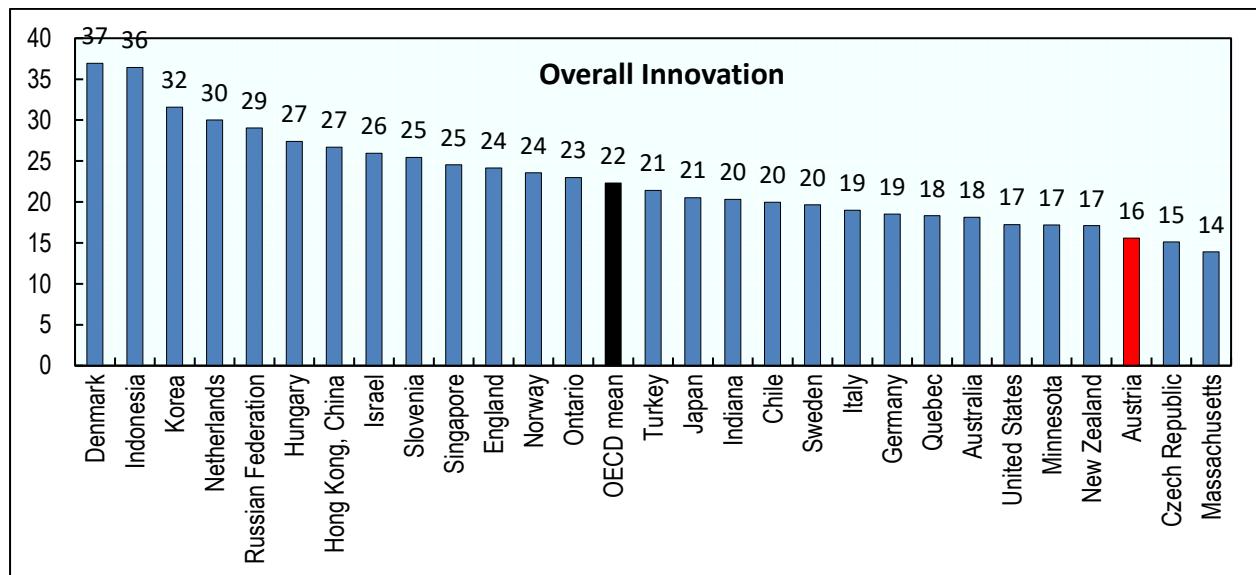
Education at a Glance 2015 - D8, Chart D8.2 Change between 2003 and 2012 in the index of quality of schools' educational resources (e.g. textbooks, computers for instruction, computer software)

ICT use at school



Students, Computers and Learning: Making the Connection - Chapter 2, Figure 2.3. Index of ICT use at school

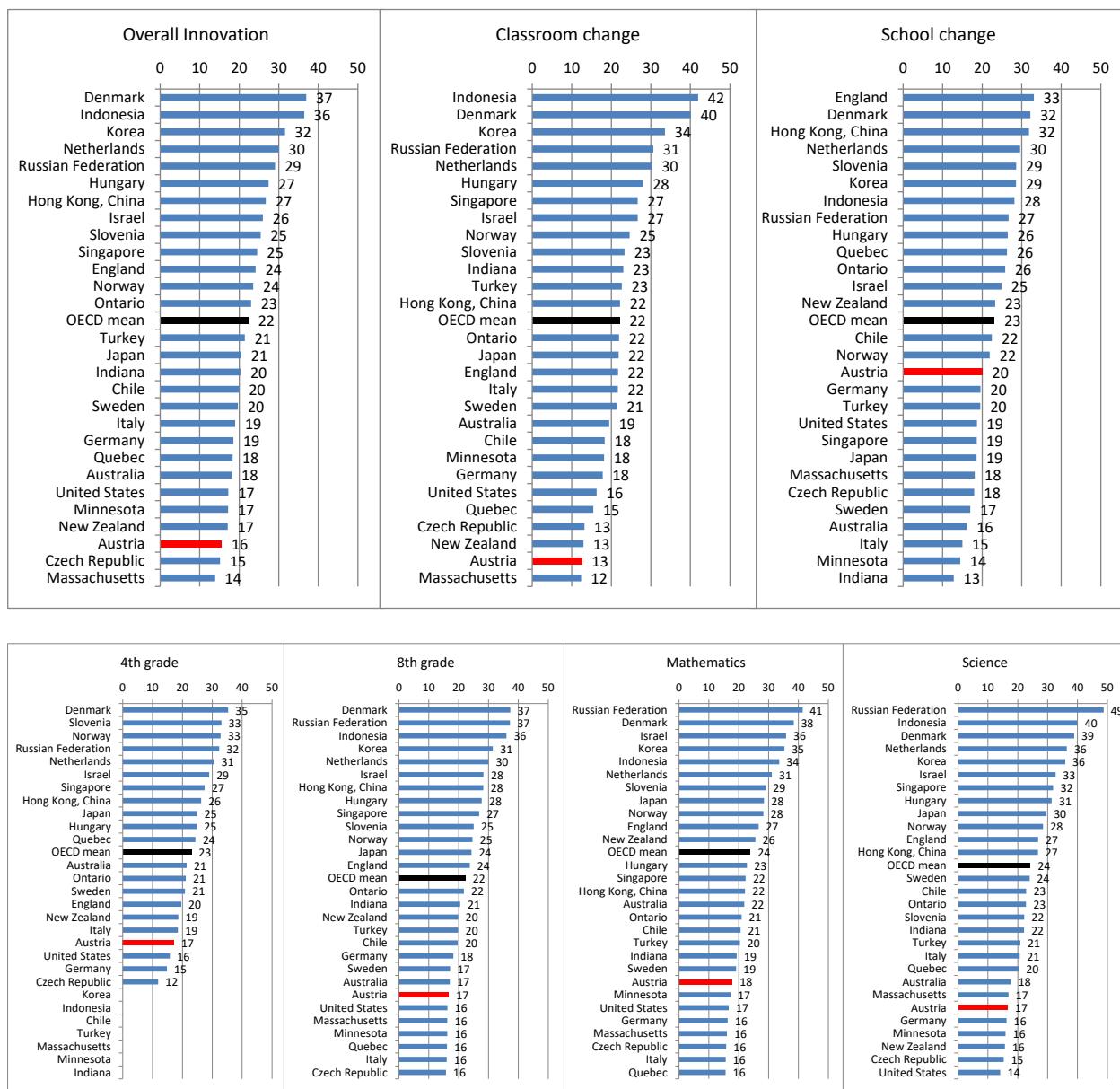
School innovation index



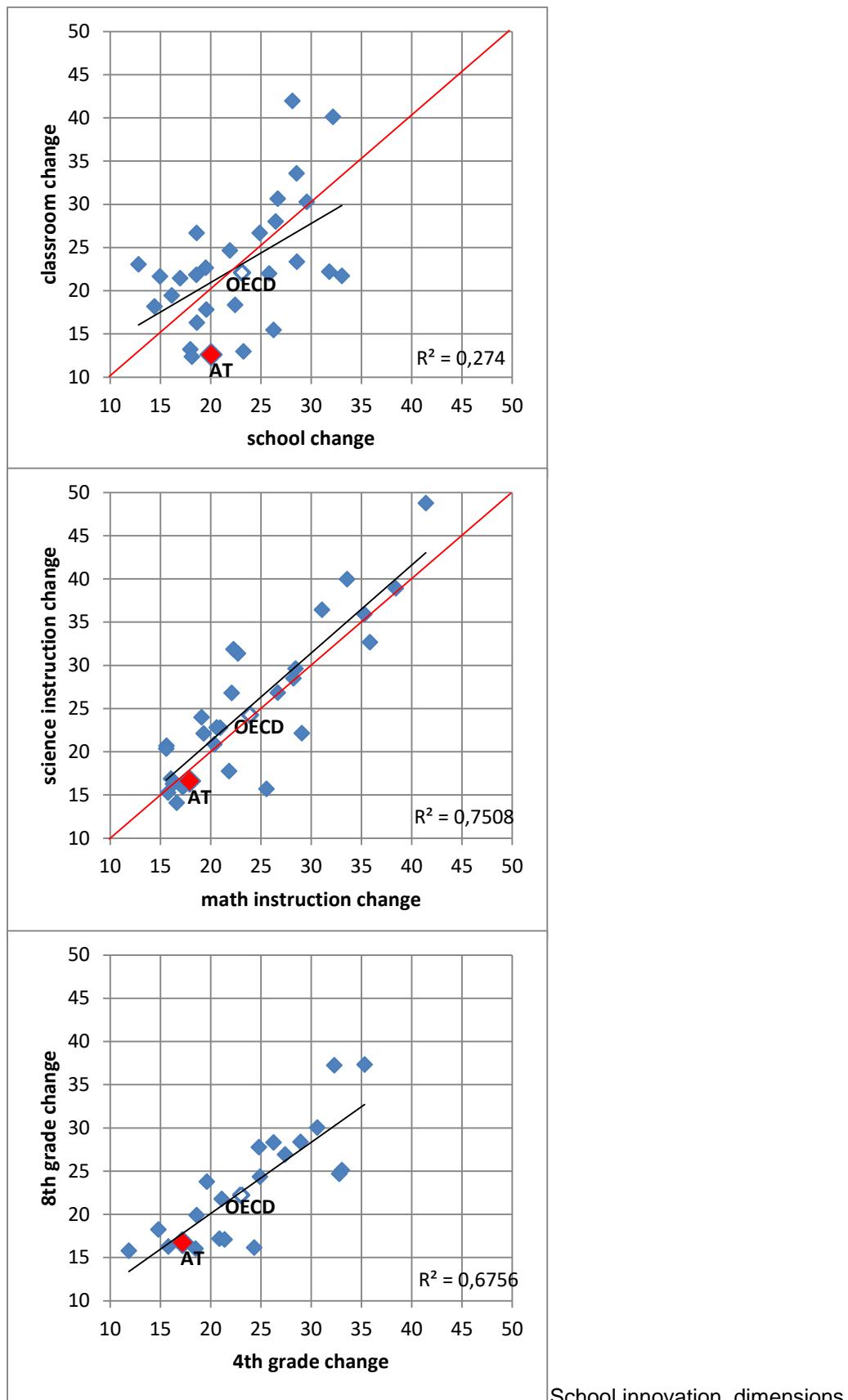
Source: Measuring Innovation in Education: A New Perspective - Chapter 17 Composite indices of innovation in classrooms and schools

ELEMENTS OF SCHOOL INNOVATION INDEX	
Classroom level	School level
Science experiments demonstration	Remedial education, ma, sci
Reading on their own	Enrichment education, ma, sci, rea 4th
Student relating to real life, ma, sci	Teachers peer discussions
Data interpretation in maths	Teachers joined for preparation of materials
Text interpretation 4th	Visits of others teachers classrooms
Explain answers in maths	Use of assessment data for comparison with district/national performance
Explain subjects in science	Use of assessment data for comparison with other schools
Observe and describe in science 8th	Use of assessment data for monitoring school progress
Group work in maths 8th	Tracking over time by admin authority 8th 4 4 3
Class ability grouping school policy	Use of assessment data for instructional or curriculum improvement
Decide procedures in maths 8th	Principal time devoted to curriculum development 1
Design and plan experiments in science	Assessment data to judge teachers' effectiveness
Choose book to read 4th 1	Achievement data to evaluate teachers performance
Use of individualized instruction in reading 4th	Achievement data to evaluate principal's performance
Textbook as primary resource of instruction, ma, sci, rea	Change in inspector's practices
Textbook as supplementary resource, ma, sci	Change in peer review evaluation of teachers' practices
Computer availability, ma, sci	Change in use of incentives for teachers' recruitment and retention
Network availability, ma, sci	Achievement data to inform parent on child performance
Use of computer to practice skills and procedures, ma, sci,	Information provision to parents : student performance relative to other students
Use of computer to look up information, ma, sci	Information provision to parents : relative to students in the same grade in other schools
Use of computer to conduct scientific experiments 4th	Parental involvement to serve on school committees
Use of computer to read text 4 th	Parental involvement to volunteer for school projects, programs and trips
	Public relations: achievement data publicly posted
	Public relations and fundraising by the principal

Overall innovation, compared to classroom and school level, grades, and subjects

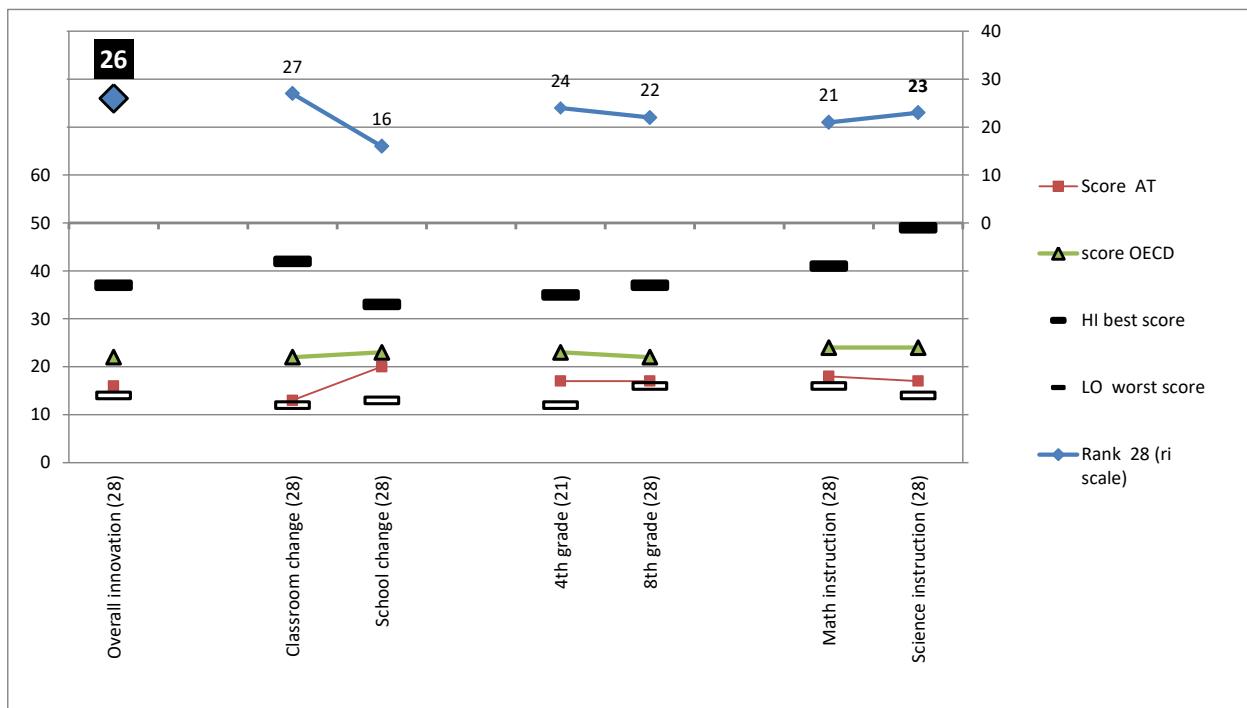


Scatter school vs. classroom change, 4th grade vs. 8th grade



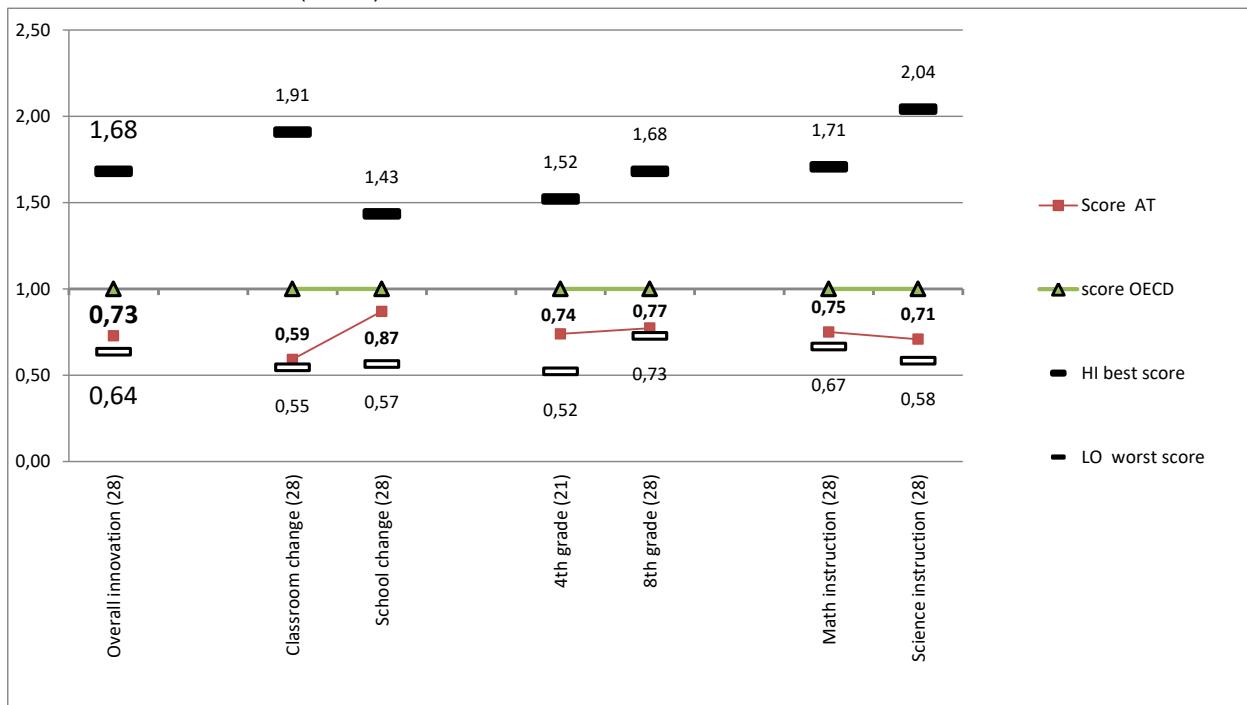
Profile of school innovation

Absolute indicators



Rank (=right scale), downward better, indicator (=left scale), upward better, position of OECD-average-score, and Austrian score between highest and lowest country/region value of score

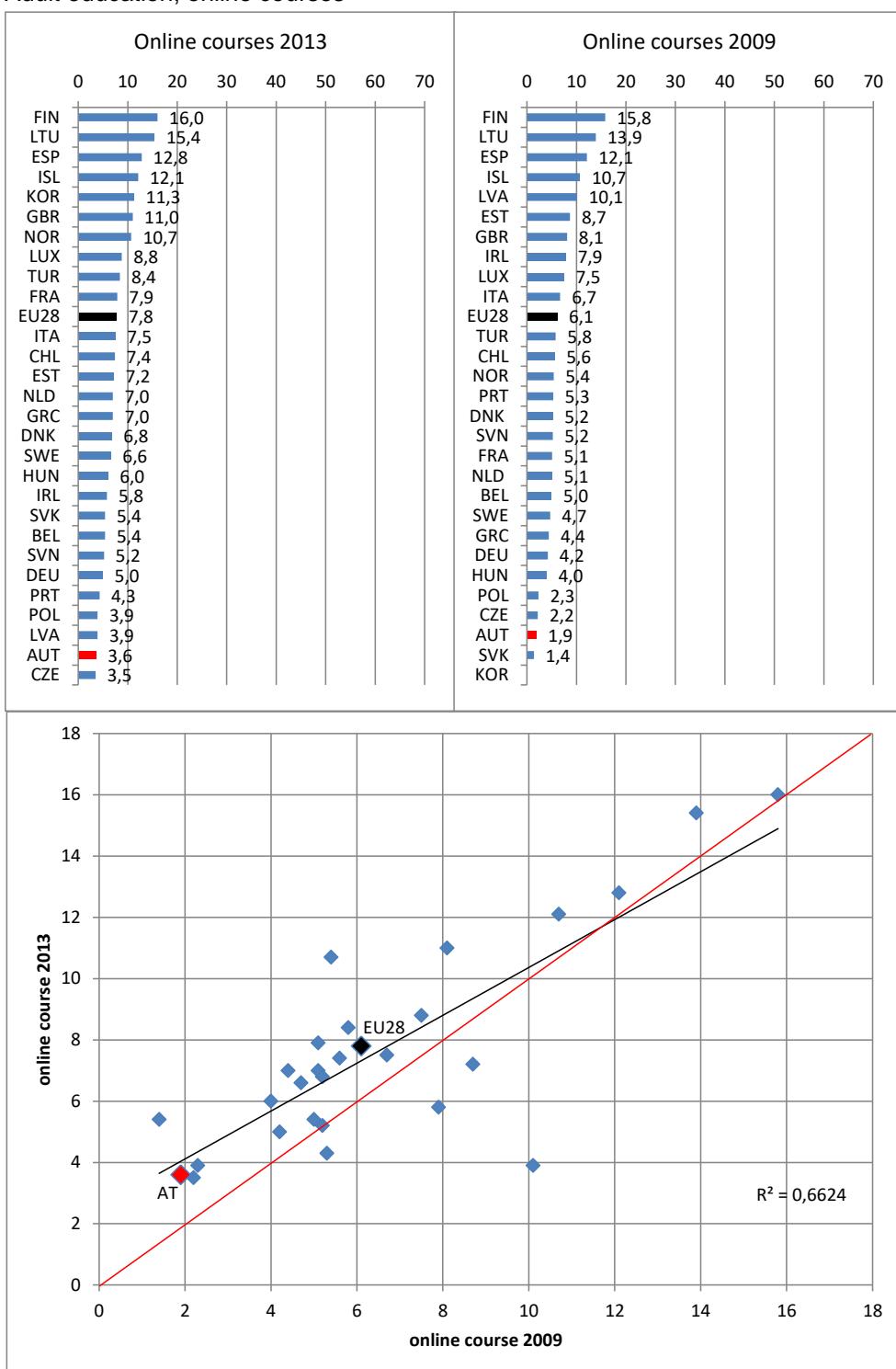
Relative to score OECD (=1.00)



Highest and lowest country/region value of score, and Austrian score relative to OECD-average-score

15.11.4 Adult education, digital

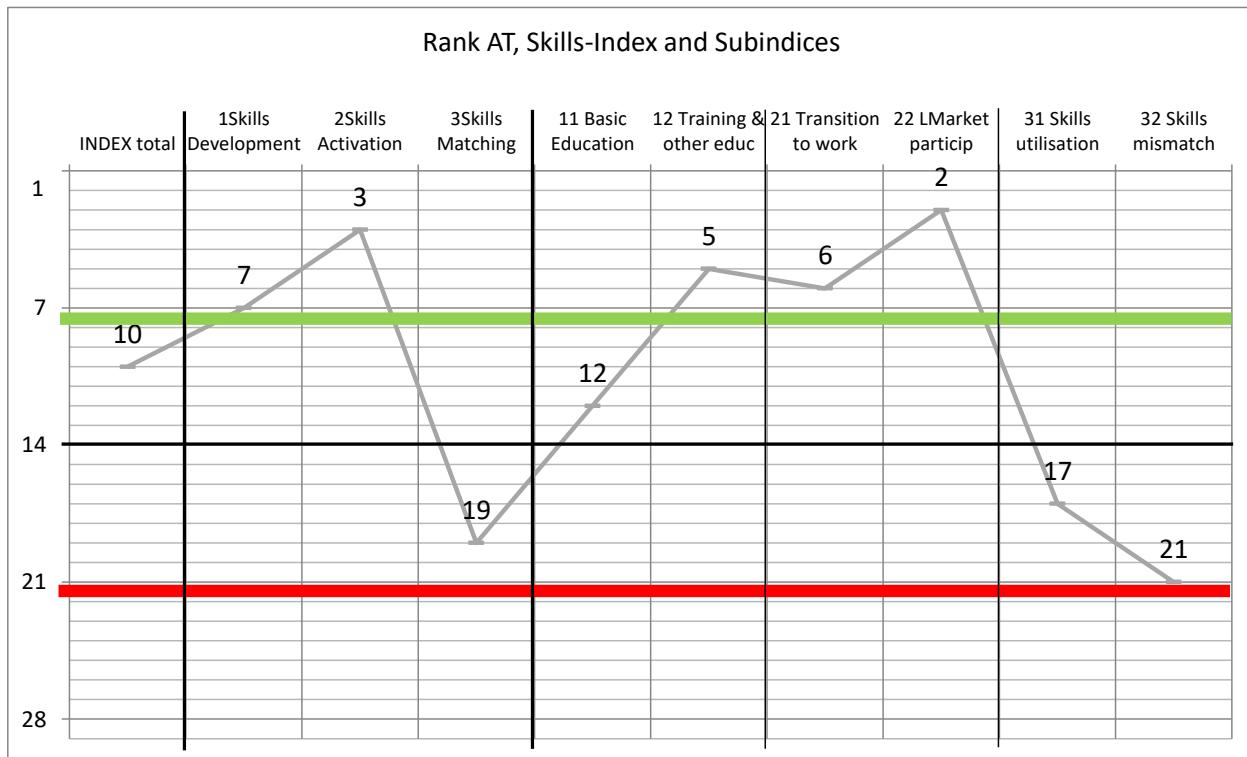
Adult education, online courses



OECD Science, Technology and Industry Scoreboard 2015 - Chapter 6. Empowering society with science and technology, 6.3.3 Individuals who participated in an online course, 2009 and 2013; Individuals who participated in an online course, 2009 and 2013 as a percentage of individuals who used the Internet in the last three months

15.12 CEDEFOP Skills Index

Fig.A1: Rank of Austria on Skills Index and Sub-Indices (green best, red worst quarter of EU 28)



1 Skills development, measures training and education activities (weight .3)

11 BASIC EDUCATION (.5)

111Pre-primary pupil-to-teacher ratio: Ratio of pupils and students to teachers and academic staff at the pre-primary education level (ISCED11 level 0, 3 years to the start of primary education) (.4)

112Upper secondary education (and above): Upper secondary attainment (and above) (ISCED11 level 3-8) (.3)

113Reading, maths and science scores : Average PISA scores (15year-olds) for reading, maths and science (.3)

12 TRAINING & OTHER EDUCATION (.5)

121Recent training: Share of population 25-64y who stated that they received formal or non-formal education or training in the four weeks preceding the survey (.3)

122VET students: Share of the population at ISCED11 level 3 who are undertaking VET (.35)

123High level computer skills : Share of 16-74 year-olds with high level computer skills (able to carry out five or six of the six tasks described in the survey) (.35)

2 Skills activation, measures the transition of people into work, and participation in the labour market (.3)

21 TRANSITION TO WORK (.5)

211Early leavers from training : Early leavers from education and training (work status 'not in employment') as a share of the population aged 18-24 having attained ISCED level 0, 1, 2 and not receiving any formal or non-formal education or training in the four weeks preceding the survey (.7)

212Recent graduates in employment : The share of employed people aged 20-34 having successfully completed upper secondary or tertiary education one to three years before the reference year of the survey and who are no longer in education or training (.3)

22 LABOUR MARKET PARTICIPATION (.5)

221Activity rate (aged 25-54) : Activity rate of 25-54 year-olds (.5)

222Activity rate (aged 20-24) : Activity rate of 20-24 year-olds (.5)

3 skills matching, measures the degree of successful matching of skills, the extent to which skills are effectively matched in the labour market (.4)

31 SKILLS UTILISATION (.4)

311Long-term unemployment : Long-term unemployment (more than 12 months) as % of active population (.4)

312Underemployed part-timers : Underemployed part-time workers aged 15-74 as share of active population. Persons working on an involuntary part-time basis are those who declare that they work part-time because they are unable to find full-time work (.6)

32 SKILLS MISMATCH (.6)

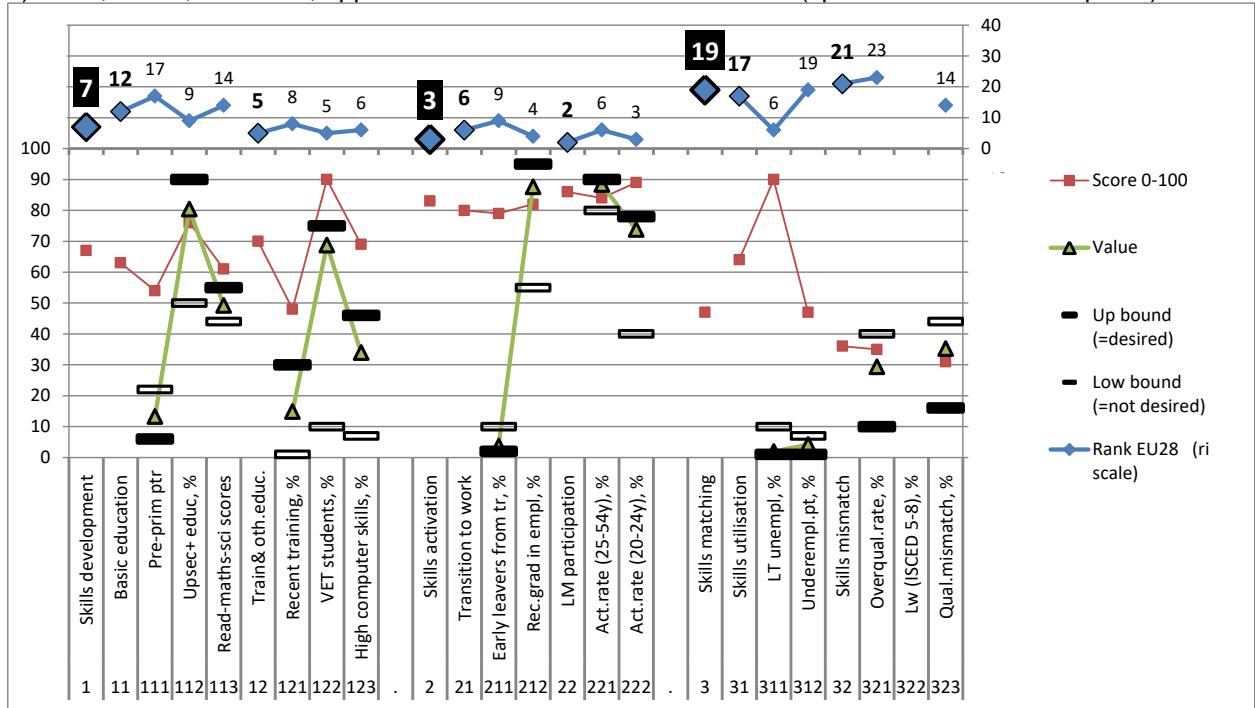
321Overqualification rate (tertiary graduates): Percentage of employed people 25-34y with ISCED 5 and 6 that occupy jobs not corresponding to ISCO 1, 2or 3 (.4)

322Low-wage earners (ISCED 5-8) : The proportion of low-wage earners out of all employees of ISCED11 level 5-8 qualification level, where low wage is defined as 'those employees (excluding apprentices) earning two-thirds or less of the national median gross hourly earnings in that particular country (.1) NOT AVAILABLE!

323Qualification mismatch : The extent to which each employee's education attainment level matches the modal education attainment level for each occupation in each industry (.5)

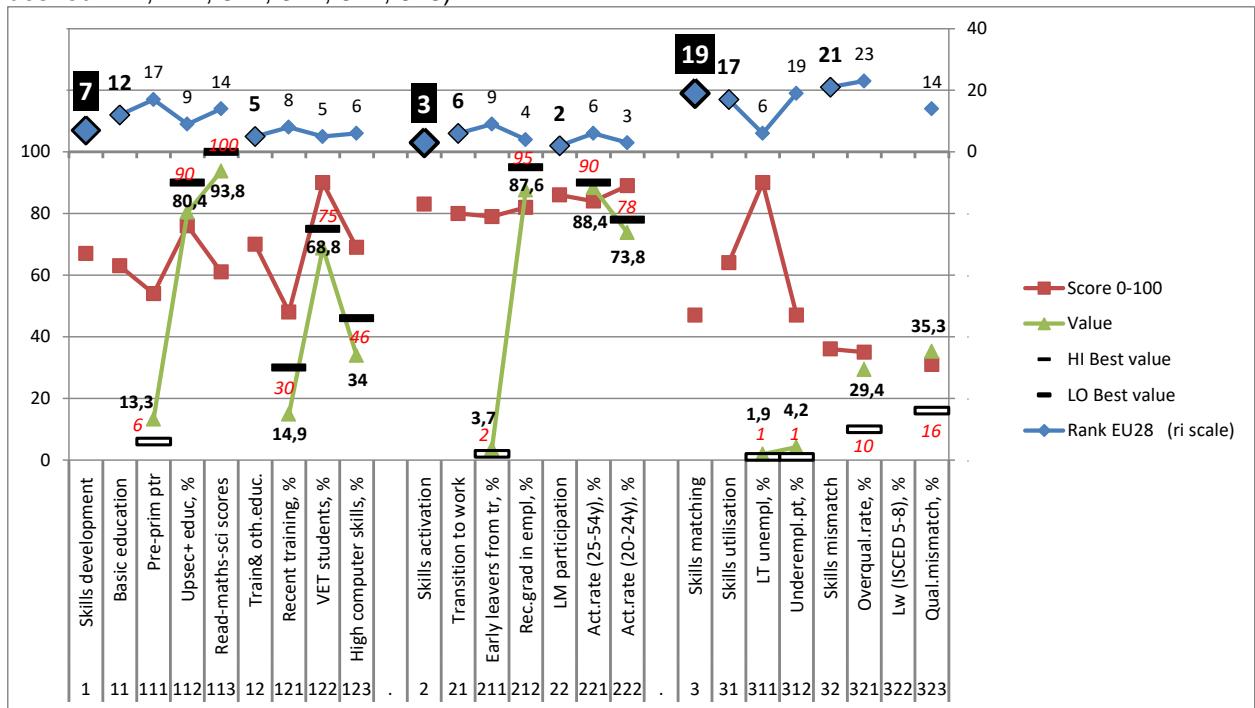
Fig.A2: Austrian profile on Skills Index and Sub-indices,

a) Rank, Score, Value AT, upper and lower bound of values EU 28 (specification see lower panel)



Remark: Score better down; value better up (100-x=room for improvement); Read-Math-Science=Score/10.

b) Rank, Score, Value AT, best value EU 28 (high desired 112, 113, 121, 122, 123, 212, 221, 222; low desired 111, 211, 311, 312, 321, 323)



Remark: Score better down; value better up, black number (100-x=room for improvement), red number best value; Read-Math-Science=Score AT= 492,2//Score Max=525*100

Fig.A3a: CEDEFOP Skills Index and Sub-Indices, ordered by total index, upper panel 1st level indices, including 12 training & other education that includes high level computer skills, lower panel sub-indices

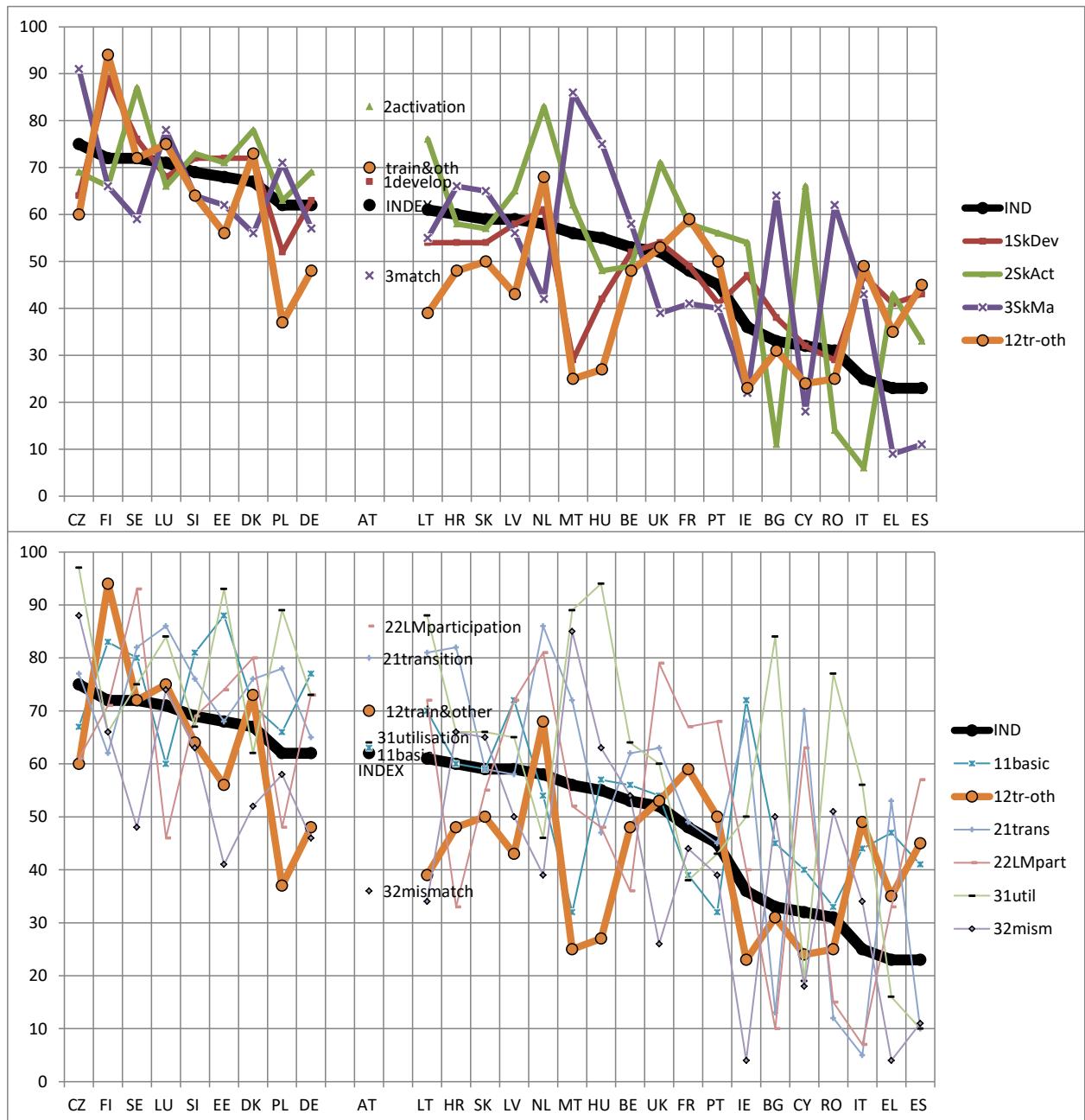


Fig.A3b: CEDEFOP Skills Index and Sub-Indices, ordered by total index, sub-index 12 training & other education that includes high level computer skills, and disaggregation

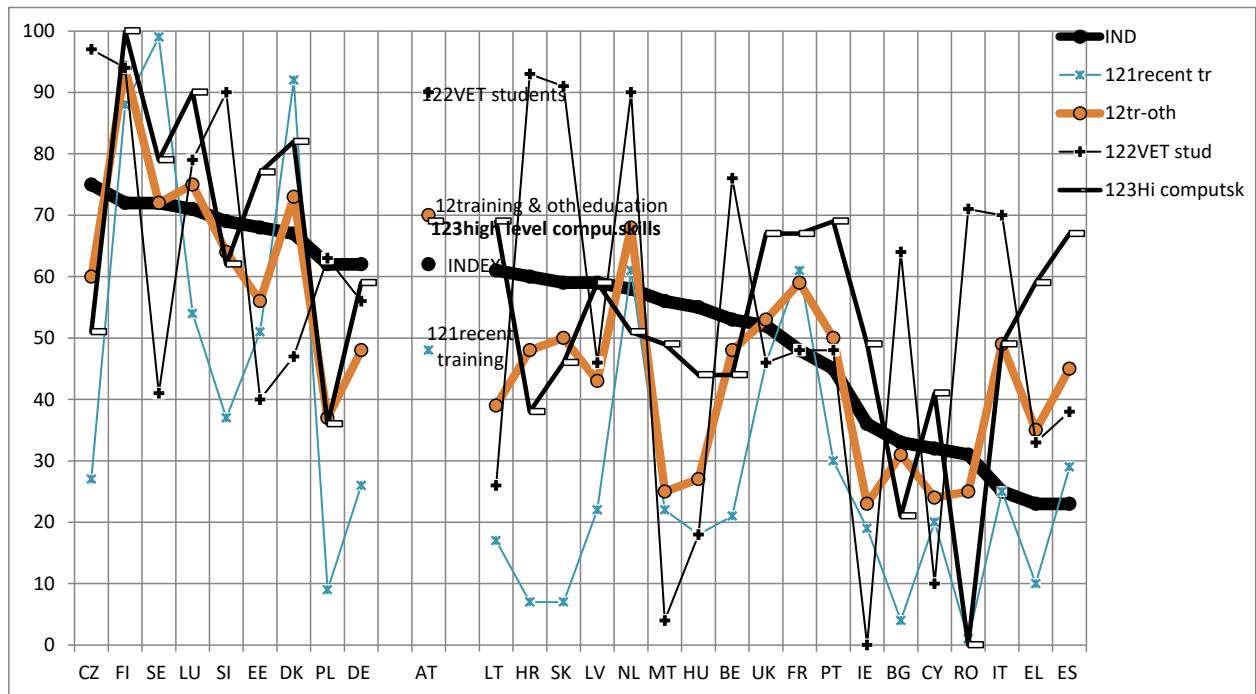


Fig.A4: Sub-indices per member state

Fig.4a: 1st level Sub-indices

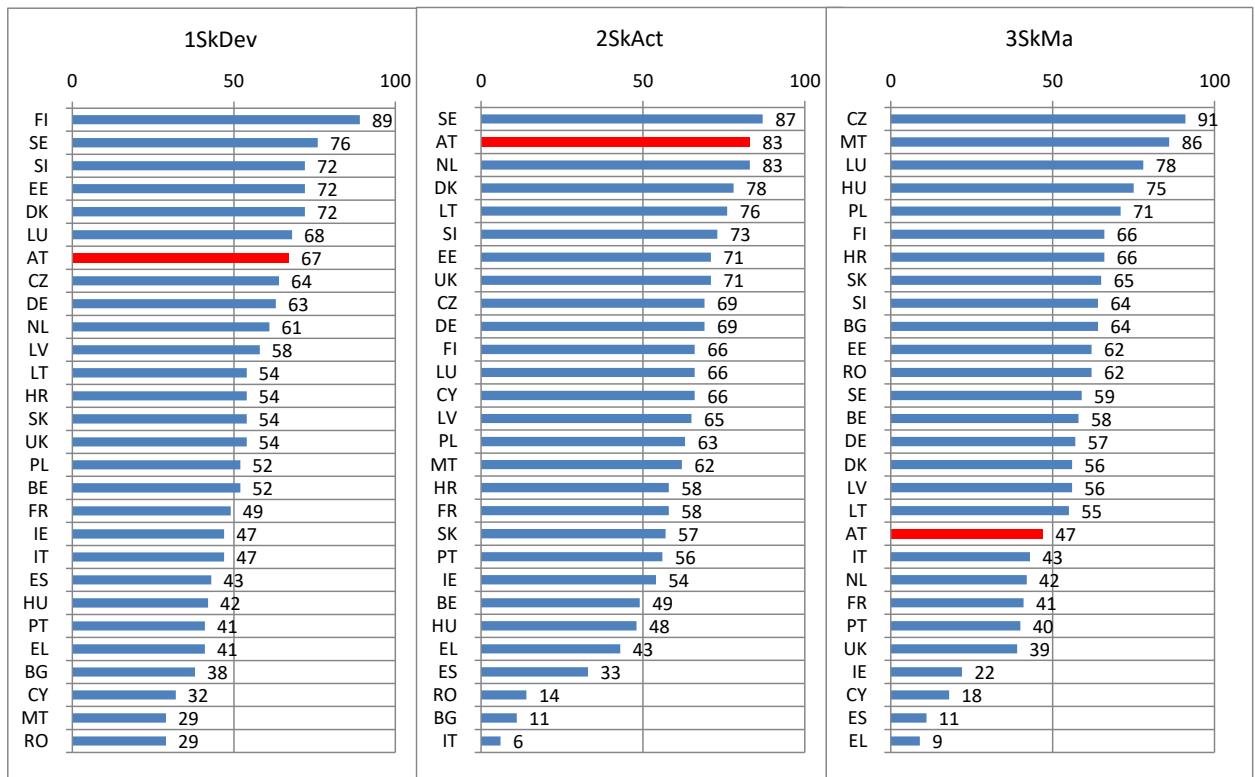


Fig.4b: 2nd level Sub-indices of Skills Development

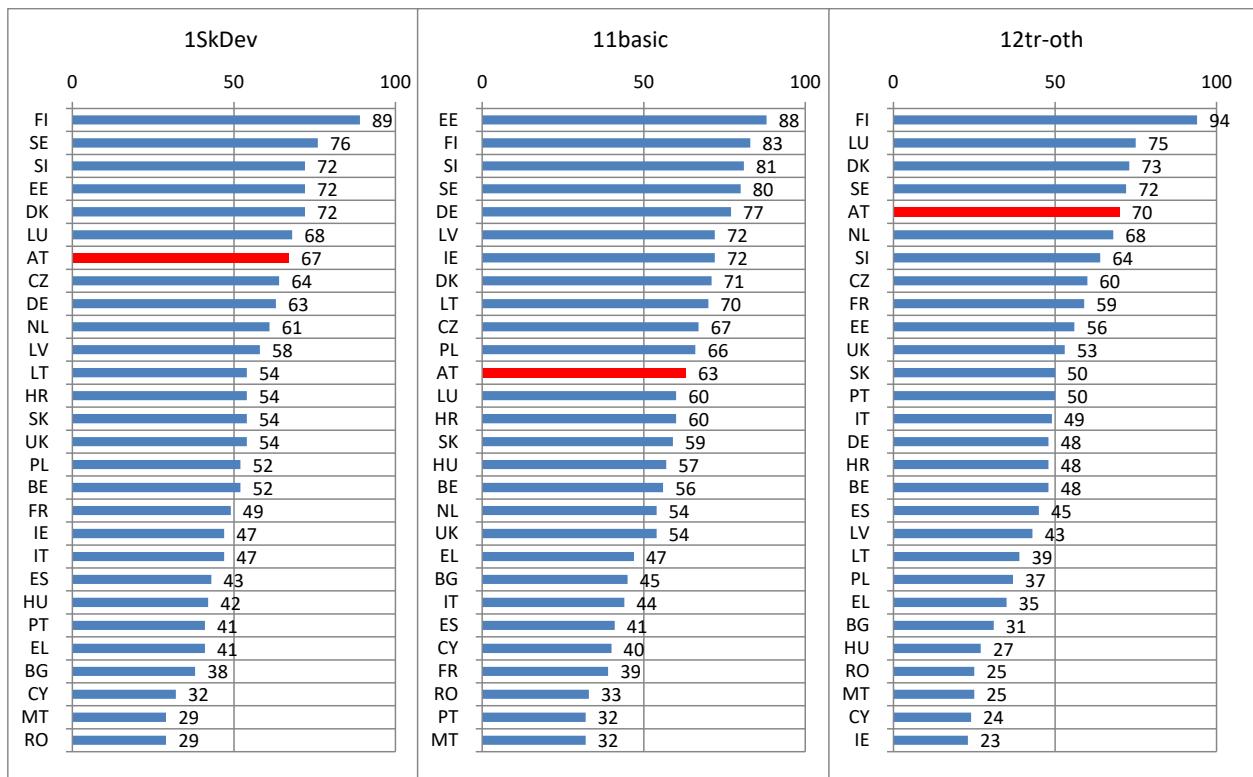


Fig.4c: 3rd level Sub-indices of training and other education

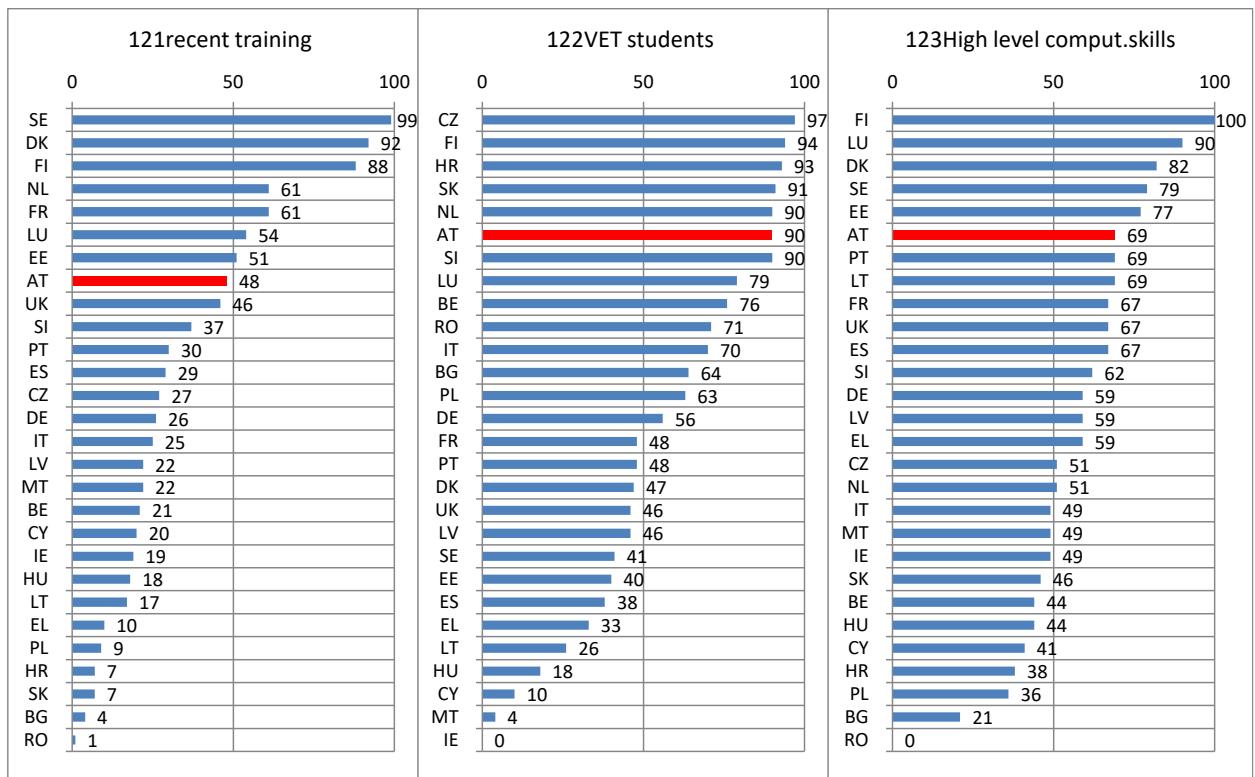


Fig.A5a: Scattergrams of Skills-Index and 1st level sub-indices (1,2,3) and 12 training & other education

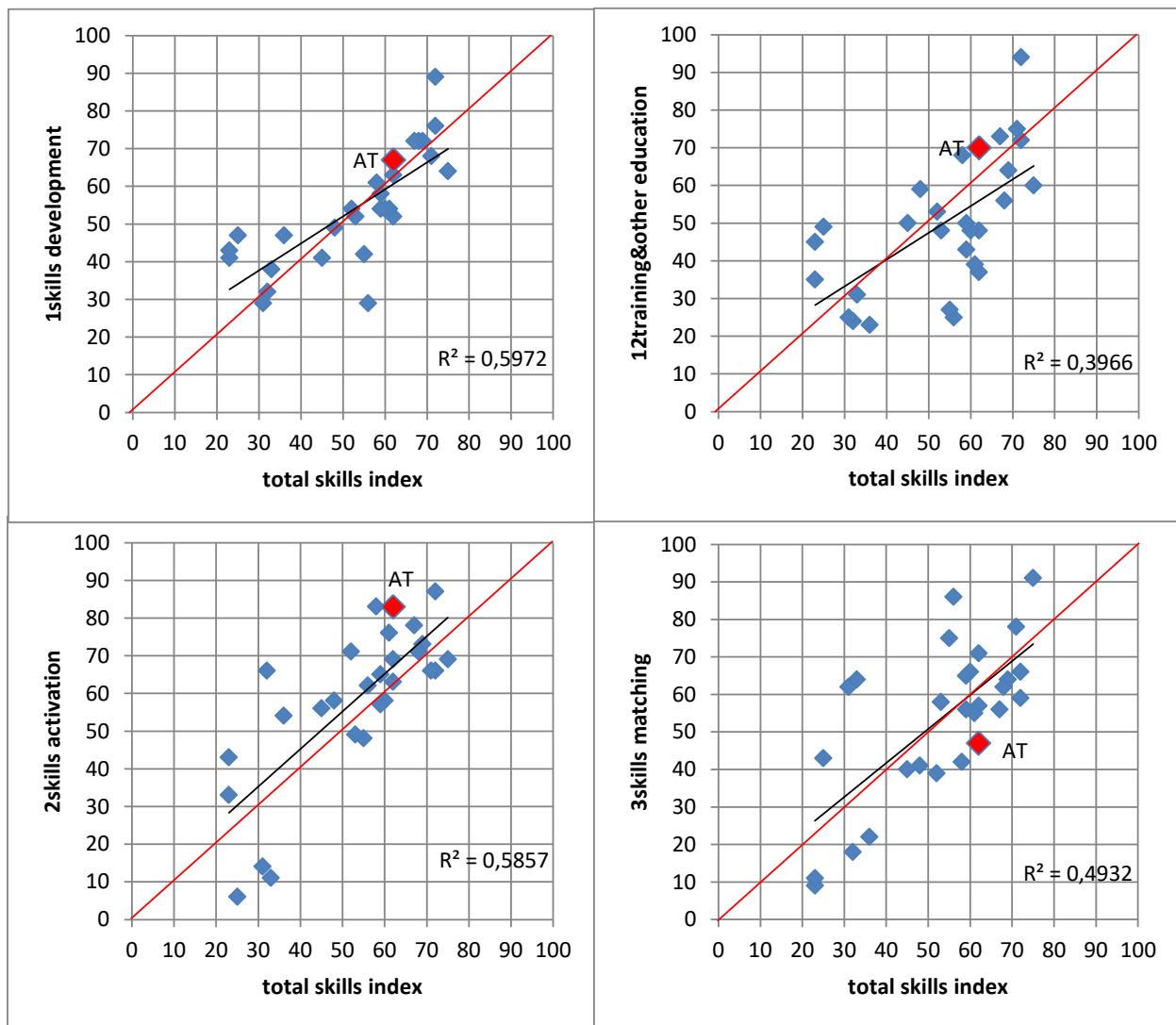


Fig.A5b: Scattergrams of 1st level sub-indices (1,2,3) and 12 training & other education

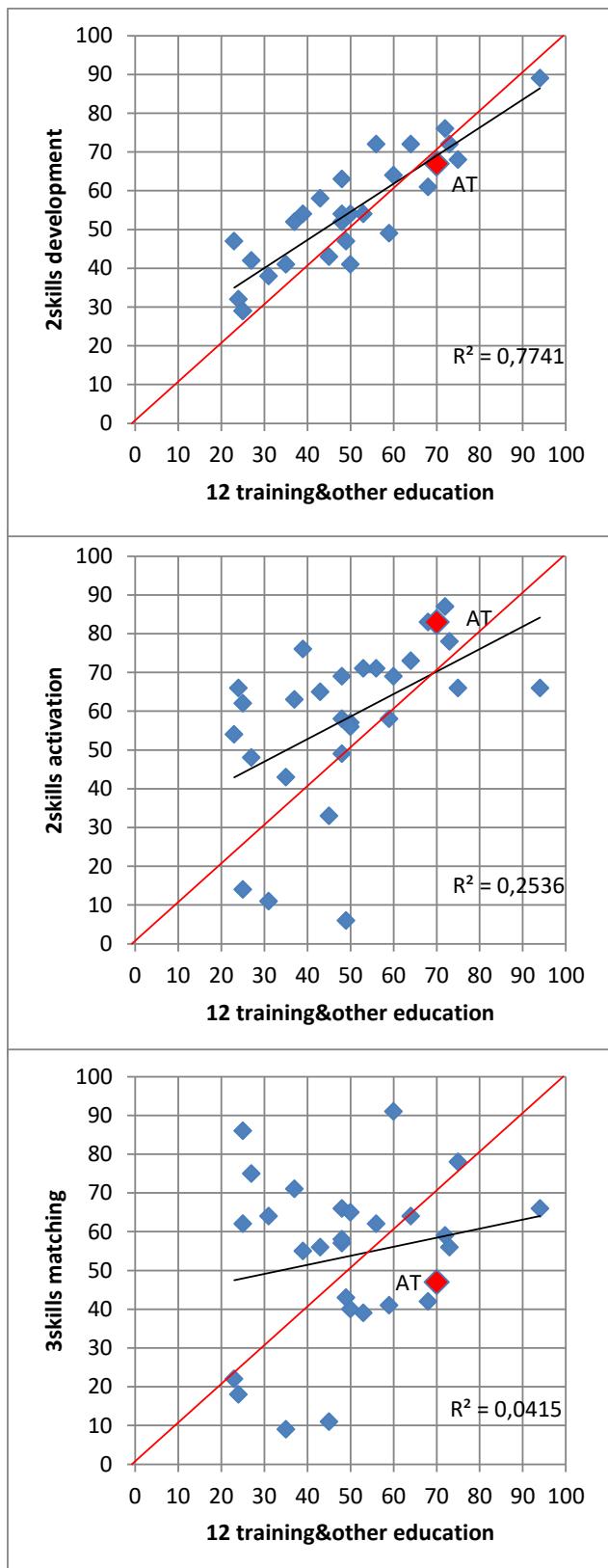


Fig.A5c: Scattergrams of 12 training & other education and 3rd level sub-indices

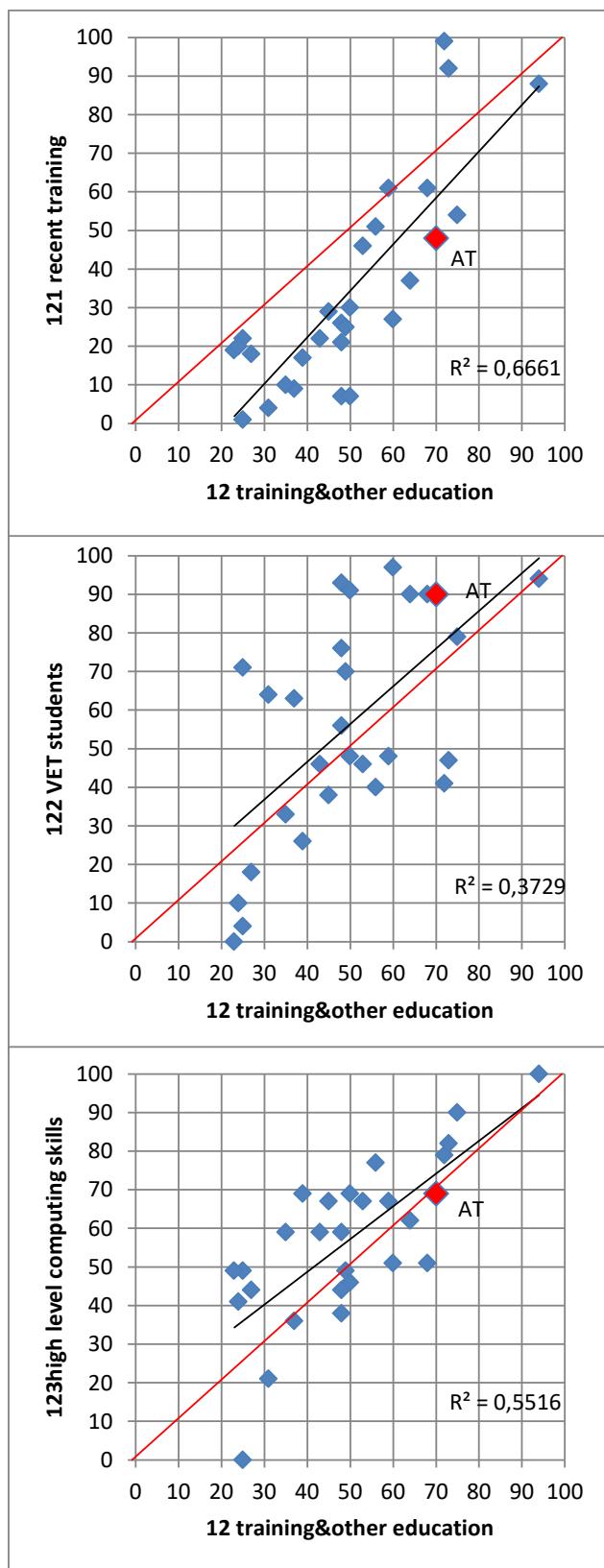
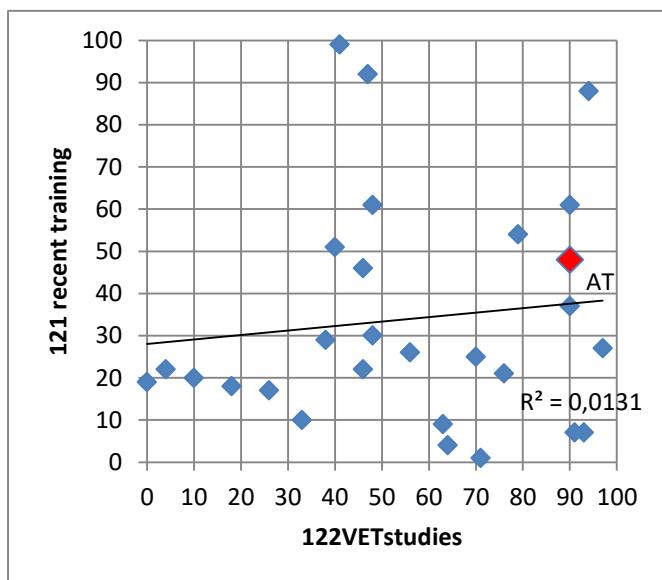


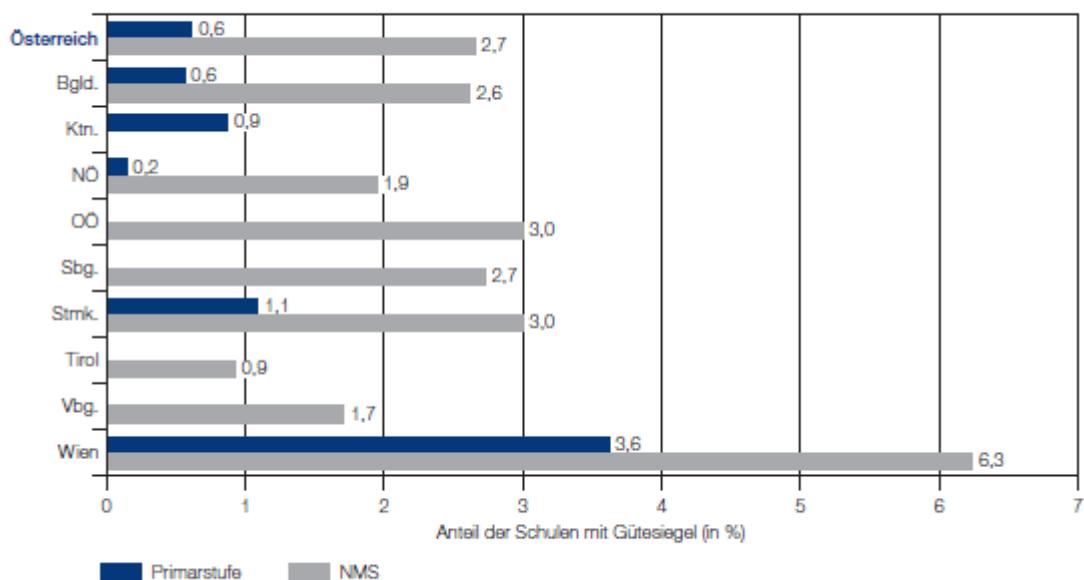
Fig.A5d: Scattergrams of 122 Vet studies and 121 recent training



15.13 Austrian NBB indicators

Schools with IT quality label, compulsory schools, primary and lower secondary (% of all schools)

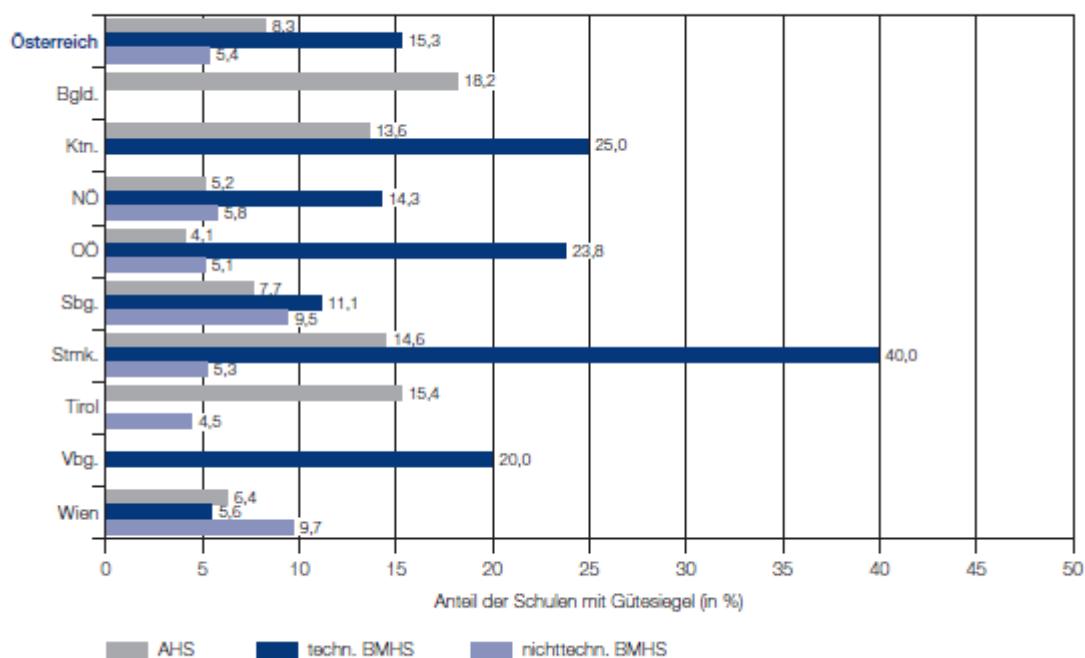
Abb. B6.f: Schulen mit Gütesiegel für digitale Kompetenzen in den Primar- und Neuen Mittelschulen (2018)



Quelle: Berechnung und Darstellung: IHS (Auswertung der Gütesiegel-Website, April 2018).

Schools with IT quality label, post-compulsory schools, general, vocational (% of all schools)

Abb. B6.g: Schulen mit Gütesiegel für digitale Kompetenzen in AHS und berufsbildenden Schulen (2018)



Quelle: Berechnung und Darstellung: IHS (Auswertung der Gütesiegel-Website, April 2018).

15.14 Schule 4.0 strategy by the ministry for education (2017)

Based on the new roadmap of the government 2017 the education ministry has streamlined the policies in this area into a new strategy in February 2017.¹³³ The step-wise implementation started in 2017/18 with pilots at innovative schools of the eEducation-network. Overall a quite extensive infrastructure for reform and innovation has already emerged during the last decade. The number of schools registered in the network (<https://eeducation.at/>) was about 1.300, around one fifth of Austrian schools. This line of development might be an important lever of innovation. Measures in Schule 4.0 were organized through four pillars and should be started in 2017/18:

- Pillar 1: **Digital basics in primary and lower secondary education.** Digital education should be included into the curricula, innovative schools¹³⁴ start immediately and distribute their experience. At grades 5-8 a compulsory programme 'digital basics' should be provided in the school autonomous realm (either as a separate subject, or integrated in other subjects).¹³⁵ At the end of primary school basic digital competences should be available; at the end of lower secondary education basic skills in informatics and using standard software should be available, and measures according to a competence framework;¹³⁶ were included in the second legal school reform package. Priorities were media education, and critical attitudes in using information, media, and social networks. Digital basic competences are described in primary school, mainly in grades 3 and 4, by 'digi.comp4'¹³⁷ and include media education. Competencies are included in curricula, and pilot schools start with implementation. The experience will be communicated, and pupils get a credential (Sammelpass). In lower secondary school, 'digi.komp8' measured by 'digi.check' describes the competences for grade 8, including basic competences, standard programmes, critical use of social networks, information and media; 'digi.check' measures the competences at grade 8; this activity started in 2017/18 with 169 NMS and AHS, and will be extended to all schools next year.¹³⁸
- Pillar 2: **Competent pedagogues.** Provision and assessment of digital competences for all new teachers should start from autumn 2017. Standardised digital competences (model 'digikompP') measured by 'digi.check' at start of induction into school are provided in continuing teacher education.¹³⁹ A compulsory portfolio includes besides the competence check a continuing education modular course of 6 ECTS for digital subject oriented didactics within three years or during initial education, and reflection of teaching, virtual programmes will be developed also. From February 2017 a federal centre for digital competences has been established at the PH Upper Austria,¹⁴⁰ and other infrastructure include Education Innovation Studios¹⁴¹ at teacher education institutions, and a future lab was established at the PH Vienna.¹⁴²
- Pillar 3: **Infrastructure and IT-provision.** During 2017 negotiations started about various assets of a full provision of broadband and WLAN, at mid-term all pupils should receive tablets at grade 4 and laptops at grade 8. Provisions for compulsory schools were included in the Finanzausgleich. In addition to WLAN and internet access in classes the initiatives under preparation are a broadband offensive for compulsory schools, a development plan of a

¹³³ Unfortunately, the information about this strategy has been removed from the ministry's webpage. BMB, Schule 4.0. – jetzt wird's digital (24.1.2017) <https://www.bmb.gv.at/schulen/schule40/index.html> (source changed)

¹³⁴ Various pioneering networks of schools have been combined in e-education: <https://eeducation.at/>; a framework and tools for the certification of innovative schools is included.

¹³⁵ See Infos zu "Digitale Grundbildung" <https://www.informatische-grundbildung.com/sekundarstufe-i/>; also Informationen zu(m Fach) Digitale Grundbildung <https://www.ahs-informatik.com/digitale-grundbildung/>

¹³⁶ See competence models and assessment tools <https://digikomp.at/>; see also Education group GmbH <https://www.edugroup.at>

¹³⁷ Digitale Kompetenzen in der Volksschule <https://digikomp.at/index.php?id=555&L=0>

¹³⁸ Futurezone, 31.8.2017 Pilotphase von Schulfach "Digitale Grundbildung" startet <https://futurezone.at/netzpolitik/pilotphase-von-schulfach-digitale-grundbildung-startet/283.627.456>

¹³⁹ See the competence model and tools: <https://digikomp.at/index.php?id=588&L=0>

¹⁴⁰ See Bundes- und Koordinationszentrum eEducation Austria <https://eeducation.at/index.php?id=159&L=0>;

¹⁴¹ Example Education Innovation Studio (EIS) <http://zli.phwien.ac.at/lernraum/eis/>

¹⁴² Example Future Learning Lab (FLL) <http://zli.phwien.ac.at/lernraum/fll/>; see also <https://www.phwien.ac.at/86-paedagogische-hochschule-wien/nachlese/2269-ph-wien-baut-schwerpunkt-zur-digitalisierung-aus>

standard IT-infrastructure at schools, framework contracts with providers, and a technical support structure for schools. Pupils should currently 'bring their own device'.

- Pillar 4: **Digital learning tools**. Provision of digital teaching material should be further developed. Materials and content will be provided through OER (Open Educational Resources), Eduthek portal (<https://eduthek.at>), including teaching and learning material, recommended Apps and instruction tools. Potential implementation scenarios for the material should be provided.

Content measures in the Schule 4.0 strategy

In the strategy Schule 4.0 a new subject was implemented in the curricula of the lower secondary school as part of the legal reform 2017, starting in 2018/19. In primary school a project "Denken lernen – Probleme lösen (DLPL)" has also been piloted since 2017, with the establishment of mobile Education Innovation Studios (EIS) at the teacher education colleges PHs that can be used by primary schools, 20 mobile EIS environments are available for around 3,000 primary schools.¹⁴³

New Subject: Verbindliche Übung digitale Grundbildung¹⁴⁴

The new subject (verbindliche Übung) includes two to four hours through four years, can be delivered as separate subject, or integrated in other subjects, core topics are use of operations systems, communication and social media, secure and critical handling of the internet, media change and problem solving.¹⁴⁵ A set of accompanying measures for schools (eEducation Austria, www.digicomp.at) and teachers (digi.folio) to support the new subject was provided in parallel:

- A self-diagnosis instrument for teachers' competences (digi.checkP)
- Further education courses with 6 ECTS workload (www.virtuelle-ph.at/digifolio)
- A platform with the results of self-diagnosis and a virtual portfolio documenting the further education and the digital practices.

The new flexible subject has been originally piloted at 178 schools at lower secondary level (out of about 1.400 schools, a bit more than 10%).¹⁴⁶ A small guide for the use of smartphones and tablets at school has been published in September 2018.¹⁴⁷

¹⁴³ The EIS are based on the Future Classroom Lab (<http://fcl.eun.org/>) of the European Schoolnet (EUN), the didactic concept includes six topics (<http://fcl.eun.org/learning-zones>).

¹⁴⁴ <https://www.bmbwf.gv.at/Themen/schule/zrp/dibi/dgb.html>

¹⁴⁵ Competences: „die digitalen Anwenderkenntnisse von Betriebssystemen, digitale Kommunikation und soziale Medien, der sichere und kritische Umgang mit dem Internet, Aspekte des Medienwandels sowie Problemlösefähigkeiten“

¹⁴⁶ <https://bildung.bmbwf.gv.at/schulen/schule40/dgb/index.html> > orig.link changed
<https://www.bmbwf.gv.at/Themen/schule/zrp/dibi/dgb.html> ;

¹⁴⁷ <http://pubshop.bmb.gv.at/detail.aspx?id=671> (source removed)

15.15 Masterplan for digitalization announced 2019-23

A new masterplan for digitalization was originally announced for the summer term 2019;¹⁴⁸ however, the work on the master plan is still going on, the BMBWF website still provides only quite general announcements in mid-June 2020.¹⁴⁹ The plan was announced by the beginning of the summer term in 2019. The response to a parliamentary inquiry 29.1.19 gives some more information about the process.¹⁵⁰

The master plan is a new initiative that succeeds the “Schule 4.0” of the previous government, the changes are motivated with synergies through the amalgamation of the ministries (e.g., in teacher education) and some additional topics (industry 4.0 and extension to occupational qualifications).

The structure follows three basic topics, content, teachers, infrastructure and governance. According to these topics **three working groups** (about 10 persons each) were established, comprising researchers, teacher education institutions, school practice and supervision (leaders), and four involved ministries. A “**sounding board**” (17 persons) of experts from research, commerce, and school practice (leaders) supports and guides the process. **Consultations** with stakeholders (not specified), school partnership (parents) and social partners are foreseen. The process is supported by **external counseling**, and an 8-persons **steering group** from the high ranks of the ministry, the ministers office and the office of the chancellor.

The process involves design thinking methods and feedback between the working groups and the sounding board. The latter seems to have a key gate keeping position by formulating the visions and giving tasks to the working groups.¹⁵¹ In the initial phase 16 working meetings on 10 days in October and November 2018 are reported before the end of January 2019.

The budget for this work is foreseen to be around EURO 340.000 maximum. The master plan should be prepared as a document including a concrete timeline and financing plan during the first quarter of 2019.

¹⁴⁸ Government proposal https://www.bmbwf.gv.at/dam/jcr:775c5fc4-6dad-41b7-bb91-bb0f8a215a43/masterplan_digitalisierung_mrv.pdf

¹⁴⁹ Website access <https://www.bmbwf.gv.at/Themen/schule/zrp/dibi/mp.html>; download document https://www.bmbwf.gv.at/dam/jcr:dbc3a630-8034-47aa-9e9d-4db35e58867c/masterplan_digitalisierung_pi.pdf

¹⁵⁰ https://www.parlament.gv.at/PAKT/VHG/XXVI/AB/AB_02241/imfname_729627.pdf

¹⁵¹ The process is described as follows: “Wie wird der Erstellungsprozess aussehen? Der Masterplan soll gemäß dem derzeitigen Planungsstand im ersten Quartal 2019 vorliegen. Die Arbeit der Arbeitsgruppen implementiert Design-Thinking-Methoden sowie Feedbackschleifen mit dem Sounding Board. Dabei werden mehrere Workshops abgehalten und die Ergebnisse mit dem Sounding Board gespiegelt. Das Sounding Board hat die Aufgabe, in mehreren Sitzungen die Ergebnisse der Arbeitsgruppen zu reflektieren, eine Vision sowie Ziele zu entwickeln und an die Arbeitsgruppen zur Bearbeitung zu übergeben. Das Ergebnis des Gesamtprozesses ist ein gemeinsames Dokument in Form des Masterplans.“(p.3)