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Assessment of the 8-points-programme for digital education, with emphasis on teacher education

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Digital education

A clear impact of Covid-19 was that digital education moved from the margin to the centre, from a longstanding sub-sector of specialist and interested people and activities to the mainstream. At the policy level the rather vague and general statements in the (third) attempt of the new government toward developing a digitalisation strategy (after efit21 in 2011, and School 4.0 in 2017) were concretised to the recent 8-point-plan.

In this paper the implementation of the 8-points-plan of digital schools is tackled in some detail. The questions addressed are quite broad and demanding, concerning aspects as the comprehensiveness and sustainability in the longer term, the provision of technical devices according to needs, the focus on the lower secondary level and the consideration of disadvantaged youth, and the degree of meeting the needs of CSRs.

Description of the 8-points-programme.¹

Measures:

1. Digital portal for schools, <https://www.pods.gv.at/willkommen/>, single signon access to a portal that includes class-registers, timetables, two learning platforms, content portals Eduthek and Edutube with search functions.²

¹ BMBWF (2021) Webpage 8-Punkte-Plan: 1.Portal Digitale Schule, 2.Einheitliche Kommunikationsprozesse, 3.Distance-Learning-MOOC, 4.Ausrichtung der Eduthek nach Lehrplänen, 5.Lern-Apps, 6.Ausbau der schulischen Basis-IT-Infrastruktur, 7.Digitale Endgeräte für Schülerinnen und Schüler, 8. Digitale Endgeräte für Lehrerinnen und Lehrer, <https://digitaleschule.gv.at/#8punkteplan>

² Portal <https://digitaleschule.gv.at/portal-digitale-schule/>

2. Common communication processes, <https://serviceportal.eeducation.at/>, the eEducation centre provides hints of how schools can decide about the choice of a common platform, clients can also access Microsoft teams if not platform is available at school.³
3. Distance-Learning-MOOC, <https://www.virtuelle-ph.at/dlm/> 15 hours CPD-(Continuing Professional Development) over one months, four units including 2 films each with additional material and questions for reflection, one unit must be completed to get to the next, in the end a certificate is issued.⁴
4. Linking Eduthek to curricula, <https://eduthek.at/schulmaterialien/>,⁵ the idea is to create a linkage between the digital curricula and digital material.⁶
5. Learning-Apps, <https://digitaleschule.gv.at/gutesiegel-lernapps/>, a quality label will be applied to learning apps based on evaluation according to pedagogic and a set of practical criteria, certified apps can be bought in the public budget for learning material; first certified apps are announced for Summer2021, from autumn the regular process will be set up.
6. Basic school IT-Infrastructure, <https://digitaleschule.gv.at/ausbau-der-schulischen-basis-it-infrastruktur/>, three goals till 2023 for all central government schools, broadband fibre-optics linkage, cables within schools, WLAN in classrooms, 7. Digital devices for pupils, 8. Digital devices for teachers.

The measures are devised to reach six goals:⁷ 1. Qualification offensive for all pedagogues; 2. harmonizing learning management and communication systems at school sites; 3. bundling of pedagogic and administrative applications, including parents; 4. broadening the supply of media; 5. optimization of IT-infrastructure by fibre-optics and WLAN among central government schools; 6. equality of opportunity and up-to-date instruction through the distribution of IT devices to all pupils at lower secondary schools.

A roadmap through to 2024 has been published at the ministry webpage:⁸

- 2020: harmonized platforms and digital portal, teachers participate in IT CPD, currently open for teachers and pupils at the upper-level central government schools, for parents some model schools are open, from autumn 2021 compulsory schools might be invited to participate.
- 2021: pupils learn with digital devices at grade 5 and 6, teachers and learners work with competence oriented digital material, quality learning apps support pupils' learning; 11,000 teachers have participated in the first MOOC August 2020; the link currently (<https://www.virtuelle-ph.at/dlm/>, April 2021) leads to the access-page in November 2020 (!), the announcement tells – against all available evidence (see section 3.2) -- that the course adds to the extensive supply of teacher education colleges,⁹ and will teachers well prepare for digital instruction.
- 2023: the IT infrastructure at central government schools (Bundesschulen, means overall the minority of about 600 upper level schools out of totally more than 5,200 public schools) is planned to be built up sufficiently, 2020 39 schools at 32 sites are announced to be connected (5% of

³ Communication <https://digitaleschule.gv.at/vereinheitlichung-der-plattformen/>

⁴ Distance learning MOOC <https://digitaleschule.gv.at/lehrenden-fortbildung/>

⁵ Example material for Digital Basic Education

https://eduthek.at/resource_details?full_data=0&resource_id=5950580&return_url=/resource_details

⁶ Eduthek <https://digitaleschule.gv.at/ausrichtung-der-eduthek-nach-lehrplanen/>

⁷ Goals <https://digitaleschule.gv.at/ziele/>

⁸ Roadmap <https://digitaleschule.gv.at/#8punkteplan>

⁹ „Der MOOC stellt als virtuelles Format eine Ergänzung und Erweiterung der umfangreichen Angebote an den Pädagogischen Hochschulen dar.“ <https://digitaleschule.gv.at/lehrenden-fortbildung/>

Bundesschulen); the compulsory schools must apply to another support programme <https://www.ffg.at/breitband/connect> that is open for public education institutions and SMEs, 90% of cost of schools can be financed up to 50,000 EURO. Given the implementation model described below, it seems that only some part of lower secondary schools that apply for the measure, will be definitely equipped with the standard IT infrastructure.

- 2024: digital education is well anchored at all schools, this statement seems much overstated, as only some difficult predictable part of lower secondary schools will receive some basic digitalization infrastructure and procedures.

250 million EURO are foreseen till 2024 (a bit more than 60 million per year) for this programme. If the amount is related to 600 central government schools, about 100,000 EURO per year and school are foreseen, if it is related to all schools, this amount goes down to a bit more than 10,000 EURO (well below the maximum support for IT infrastructure).¹⁰

Implementation. The implementation of the programme has been outsourced to an agency of the ministry (<https://oead.at/>), and streamlined in a manual towards a 12-steps application process by individual schools for the provision of devices to pupils (see Annex customer journey):¹¹ 1. Call to school principals (Oct 2020), 2. Discussion in school partnership, 3. Evaluation of school infrastructure, 4. Decision within school, 5. Accept pre-formulated letter-of-intent (extended end Jan 2021),¹² 6. Forming school steering group, 7. Provide necessary school infrastructure, 8. Public relations for next year's pupils, 9. Completing MOOCs, 10. Integrate digitalization concept into school development plan, 11. Receive devices, 12. Use devices.

The implementation is focused on the distribution of mobile devices to 5th and 6th graders at 220 lower secondary academic schools AHS (central government schools) and 1,000 lower secondary compulsory schools, dependent on application by their school. A law has been amended to use public money for pupils' devices (the shortcut for the programme is device initiative: Geräte Initiative). In addition, schools must secure their basic infrastructure requirements for digital learning, that is financed by the providers at central level for AHS and at regional/local level for compulsory schools; the latter cannot be controlled by the ministry.

Thus, the ministry can only control/secure the implementation at AHS, which are the minority of applicable schools (220 lower secondary AHS schools with about 50,000 5th and 6th graders and estimated 6,000 teachers involved, compared to 1,000 lower secondary compulsory schools with about 100,000 5th and 6th graders and estimated 14,000 teachers involved). The table shows, how the eligible schools and their pupils and teachers are positioned within the overall school structure.

¹⁰ Statistik Austria schools

http://pic.statistik.at/wcm/idc/idcplg?IdcService=GET_NATIVE_FILE&RevisionSelectionMethod=LatestReleased&dDocName=020953 pupils per grade

http://pic.statistik.at/wcm/idc/idcplg?IdcService=GET_NATIVE_FILE&RevisionSelectionMethod=LatestReleased&dDocName=029642 teachers

http://pic.statistik.at/wcm/idc/idcplg?IdcService=GET_NATIVE_FILE&RevisionSelectionMethod=LatestReleased&dDocName=125684

¹¹ Manual

https://digitaleslernen.oead.at/fileadmin/Dokumente/digitaleslernen.oead.at/Dokumente_fuer_News/8P_Manual_final_Fristverlaengerung.pdf

¹² Letter-of-intent

https://digitaleslernen.oead.at/fileadmin/Dokumente/digitaleslernen.oead.at/Dokumente_fuer_News/Letter_of_Intent.pdf

The lower secondary AHS that are clearly under the responsibility of the ministry comprise about 5% of all schools, and their 5th and 6th graders make around 5% of all pupils, and directly involved teachers also make about 5% of total teachers. The total of eligible schools, including the compulsory lower secondary schools comprise about one quarter of all schools, and 15%-to-17% of pupils and teachers (within the eligible schools the directly controlled AHS make 17% of schools and one third of pupils and teachers).

The primary schools, which are not affected at all by the measures, comprise half of all schools and one third of pupils and teachers, and the vocational schools that will be indirectly affected in the future from 2025, when the “digitalized” pupils from compulsory schools will attend them, make another 9% of schools and one quarter of pupils.

Numbers of schools, pupils, teachers, eligible vs. total

	Schools	5th+6th graders	teachers*
ABSOLUTE			
publ.AHS low sec	220	52,321	6,426
publ compuls low sec	1,054	96,486	14,331
sum eligible	1,274	148,807	20,757
% AHS	17%	35%	31%
Pupils			
publ.primary	2,897	326,670	33,336
publ.vocational	474	269,479	27,501
total public	5,207	1,014,344	121,947
% OF TOTAL			
publ.AHS low sec	4%	5%	5%
publ compuls low sec	20%	10%	12%
sum eligible	24%	15%	17%
Pupils			
publ.primary	56%	32%	27%
publ.vocational	9%	27%	23%
total public	5,207	1,014,344	121,947

*teachers: total number, no distinction between public and private, estimation: half of total number and AHS proportion of lower secondary pupils 0.57

Comprehensiveness and sustainability of the programme in the longer term

The programme in its main cornerstones provides and modifies different kinds of tools for digitalisation (common portal, communication platforms, eduthek, learning apps, IT infrastructure, mobile devices). In the course of provision of mobile devices some process related requirements for the organisation of schools are set by signing a letter of intent (decision by school partnership, evaluation and securing necessary infrastructure with school owner based on a checklist, establishment of a steering group, decision about a platform, internet and handy/smartphone policy,¹³ a digitalisation concept).

Teachers are invited to participate in the Distance Learning MOOC (see above), and to use the eBuddy¹⁴ principle for CPD. Pedagogy is addressed by the recommendation of using phases of self-directed

¹³ Blueprint <https://www.saferinternet.at/faq/lehrende/wie-kann-eine-internet-und-handy-policy-in-der-schule-aussehen/>

¹⁴ „Gegenseitige Unterstützung nach dem Prinzip „eBuddy“. Das Prinzip „eBuddy“-System des eEducation-Netzwerkes bringt jeweils eine Lehrkraft mit Erfahrung in digital-inkludierender Fachdidaktik mit einer Lehrkraft zusammen, die in dieser Hinsicht gerade ihre ersten Schritte unternimmt. Gemeinsam wird eine konkrete Unterrichtseinheit unter Nutzung digitaler Technologien geplant, im Teamteaching abgehalten und schließlich reflektiert: Was ist gut gelaufen, wo gibt es Verbesserungspotenzial?“ Explanation in Letter-of-Intent

learning¹⁵ and by intending the competences required in the curriculum of the Digital Basic Education Curriculum.

The comprehensiveness and impact of the programme can be heavily questioned. The points include a set of tools that obviously contribute to the requirements of digitalisation, they can be classified to some extent necessary, however, are they also sufficient to (most) effectively and efficiently increase digital practices? The NER-National Education Report 2018 has put teachers' motivation and competences at the centre of attention. The subject of Digital Basic Education should be further developed with greater transparency and commitment, clear qualification requirements for teachers should be set, and the networking practices of eEducation should be further developed towards structures of community of practice. So, the question is whether the appropriate *use of infrastructure* and tools will be substantially improved by gradually improving the infrastructure?

Several more general points are rather gradual, putting together several functions into a portal, linking the material to the curriculum, and evaluating apps (points 1,4,5) are helpful for users; however, will they increase digitalisation? Hardly. The streamlining of platforms within schools (point 2) is an important aspect for engaged schools, and it has already been addressed by the platform policy from June 2020,¹⁶ after the first lockdown and the shift to unprecedented emergency remote teaching.

The distance learning MOOC (point 3)¹⁷ is only a minimal provision for basic access to remote teaching, however, seems not being continuously provided, and according to the analyses of teacher CPD in IT in NER 2018 and in this report based on the EU 2nd survey and OECD TALIS this field is in strong need of further development.

The points 6-8 concern the IT-infrastructure and the provision of mobile devices to pupils and teachers, with the inbuilt bias towards the academic AHS vs. compulsory schools. These points are bundled in the initiative "Digital Learning",¹⁸ that is outsourced to an agency that has multiple purposes and is not specialised in IT provision or digitalisation. The eEducation competence center has only some ancillary functions. *The project looks like a streamlined business strategy rather than an educational development project.*

So the main impact for sure will be that successively pupils starting from grade 5 will receive mobile devices from public money if their schools apply for that. On the one hand resources are bound by this project, and schools will probably increasingly apply for the devices and related IT infrastructure and organisation.

¹⁵ „Digital-inkludierende Fachdidaktik. Das bedeutet, dass digitale Endgeräte bewusst und sinnvoll in zweierlei Hinsicht eingesetzt werden: -Sie unterstützen das Lehren und Lernen im Fach gezielt: zum Beispiel, indem sie Inhalte durch Simulationen oder Visualisierung leichter begreifbar machen. -Sie unterstützen den gezielten Aufbau von digitalen und medienbezogenen Kompetenzen bei Schüler/innen: etwa, indem Medieninhalte produziert werden.“
Explanation in Letter-of-Intent

¹⁶ Platform policy: eEducation (22.04.2021) Sinnvolle Kombination von Lern- und Kommunikationsplattformen am Standort <https://serviceportal.eeducation.at/index.php?id=840>, official Letter to school leaders BMBWF (n.d.)
Empfehlungen für die Vereinheitlichung der Lern- bzw. Kommunikationsplattform GZ: 2020-0.376.370
BMBWF/Abteilung Präs/15 – allgemein

https://serviceportal.eeducation.at/fileadmin/user_upload/Schreiben_an_Schulleitungen.pdf

¹⁷ BMBWF webpage (22.04.2021) Digi.konzept MOOC startet am 12. April 2021

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

¹⁸ OeAD-GmbH – Agentur für Bildung und Internationalisierung (22.04.2021) Über die Initiative Digitales Lernen, <https://digitaleslernen.oead.at/>

However, how this infrastructure will be used is widely left open, and the course of development will certainly need further effort.

Looking back, we can see already a long tradition of attempts towards “strategies” for digitalisation under certain priorities and labels, from the 1980s for informatics, followed in the 1990s by media education, in the early 2000s support of infrastructure was prioritised. Early policies were implemented by engaged people from bottom-up, without sufficient support from top-down, and did not develop a critical mass for broader adoption. *Since 2011 we find three “strategic” waves* that were more or less ad-hoc devised at high levels of politics. Examples are the efit21-strategy from 2011 that already included *the same elements that were “re-invented”* by schooling 4.0 in 2017, and the new “masterplan” 2018¹⁹ also gives very general phrases without analysis. The previous policy attempts are not definitely evaluated, and if research is done about that,²⁰ it is not really considered by policy makers.

An example is the establishment of an elective IT subject, that occurred already in the late 1980s and was shifted to the realm of curriculum autonomy. The new subject from 2017 was nominally transformed into a compulsory one, however established in a similar “elastic” and autonomous way that its time must be taken away from other subjects; thus, the critique from 2011 holds again.²¹

Provision of technical devices according to needs

The focus on the provision of technical devices and digital tools can be evaluated against the position of Austrian schools in Europe based on the wide range of indicators provided in the EU 2nd survey. The Annex provides an overview about the 145 indicators included in the survey report, and shows that Austrian position compared to the EU average and the minimum and maximum values in the range across EU member states. The overall position is slightly below average, and the thematically grouped variables show that Austria ranks best with the infrastructure variables, and worst with teacher CPD and school level policy variables. Students IT use and confidence shows a mixed position distributed to relatively low, medium and high positions. Teachers’ use and confidence variables are positioned around the average.

This positioning, that has to the knowledge of the author not been used so far in the Austrian discourse, would not support the high emphasis on technical devices. In particular, students are comparatively good provided with access to devices, so making this the main priority cannot be backed with the survey information.

Focus on the lower secondary level and the consideration of disadvantaged youth

The analysis of the EU 2nd survey in common with several other sources shows that compared to the practice in EU countries digitalisation is overall very much lower at the primary school level (ISCED 1) than at the secondary school levels (ISCED 2 and 3). *The programme leaves again primary schools, and thus a large part of the education structure, almost completely out of attention.*

¹⁹ BMBWF webpage (2021) Masterplan für die Digitalisierung im Bildungswesen <https://www.bmbwf.gv.at/Themen/schule/zrp/dibi/mp.html> document https://www.bmbwf.gv.at/dam/jcr:dbc3a630-8034-47aa-9e9d-4db35e58867c/masterplan_digitalisierung_pi.pdf

²⁰ NBB 2015, 2018

²¹ „In the age-group of 10-14 years, the Austrian curriculum only provides very vague guidelines for an elective subject informatics and to integrate IT in other subjects without any accountability.”p.6 Micheuz 2011

On the other hand, there is evidence that the use of digital devices among young people in Austria is quite high, and the EU kids-online-project conclusions propose stronger educational interventions.²²

Degree of meeting the needs of European country specific recommendations for Austria

The provision of mobile devices to *all* 5th and 6th graders is emphasised by the government as a measure to improve equality of opportunity. However, this must be questioned.

A school has to decide whether it steps into these processes and requirements of distribution of devices. This decision might depend on many factors, one is probably how much the school already fulfils the requirements and must only engage with a small additional effort. Thus, schools that are already engaged will get additional resources more easily than schools with less experience.

An additional barrier is that the ministry as provider of the programme will more easily support the infrastructure of its own schools (AHS), which are the privileged ones, and the compulsory schools must convince their decentral owners to provide the necessary infrastructure quite quickly (in the midst of the Covid-19 crisis).

Thus, with the overall structure of the measure, the danger of a “Mathew effect”, those who have will get more, those who don’t have, will get less, is strongly structurally included in the programme. Measures to reverse these structural tendencies must be considered, e.g., at least a 9th point to the 8-point programme, to provide massive support for schools with a low social index, that have a bad starting position for digitalisation.

Teaching profession and teacher education

In teachers’ professional development, the implementation of the reform of IPD initial professional development (PädagogInnenbildung NEU) is still ongoing.

In teacher continuing professional development (CPD) some analyses are available; however, policy is still weak in this respect. Main initiatives are MOOCs for basic distance learning and, more recently, basic programmes to support the 8-points-programme for digitalisation.

A more detailed analysis of the Austrian position in the EC (2019) 2nd Survey of Schools about ICT in Education shows clearly that Austria is situated at all teacher CPD indicators below EU-average (see documentation in the Annex). However, at the same time teachers are comparatively quite confident about their IT-related competences (see the documentation in the Annex); this may be due to a biased selection

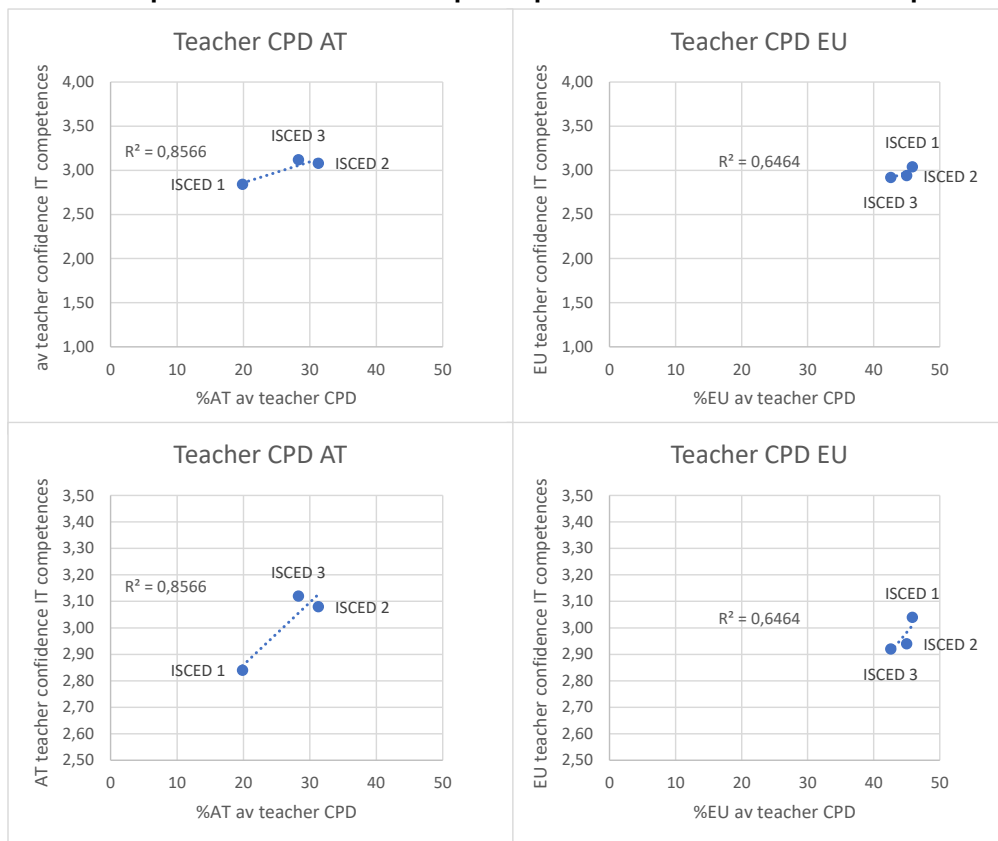
²² Haddon, Leslie, Livingstone, Sonia and the EU Kids Online network (2012) EU Kids Online: national perspectives. EU Kids Online, The London School of Economics and Political Science, London, UK. This version available at: <http://eprints.lse.ac.uk/46878/>, report http://eprints.lse.ac.uk/46878/1/_lse.ac.uk_storage_LIBRARY_Secondary_libfile_shared_repository_Content_EU%20Kids%20Online_EU%20Kids%20Online%20national%20perspectives_2014.pdf

in the survey of teachers more interested in digitalisation.²³ In the TALIS-study the Austrian teachers show a rather disappointing picture about their IT-competences.

Across all types of IT-related CPD the Austrian average of participation was 40% below the EU average; among teachers in primary school participation was 60% below average (in certain types even 70% to 85% below average). Among types the Austrian proportion is particularly low with longer CPD with 6 days or more during two years (60% below average). Austrian teachers' confidence in their IT competences is at average, however, primary teachers' confidence is in four of five competence categories below average, and in all categories below secondary and upper secondary teachers.

A look at the (slight) relations between CPD participation and confidence about competences along the ISCED levels shows different relationships at different types and categories. The total average relationship looks different in Austria than in EU, with lower participation and competence confidence among primary education teachers than among teachers at later stages, whereas participation and confidence is highest in primary education at EU level, with smaller differences between ISCED levels at both dimensions are at EU average than in Austria (range around 45% in EU and only 20%-to-30% in Austria. The CPD types do also include informal personal individual and collective learning activities in addition to more formal types.

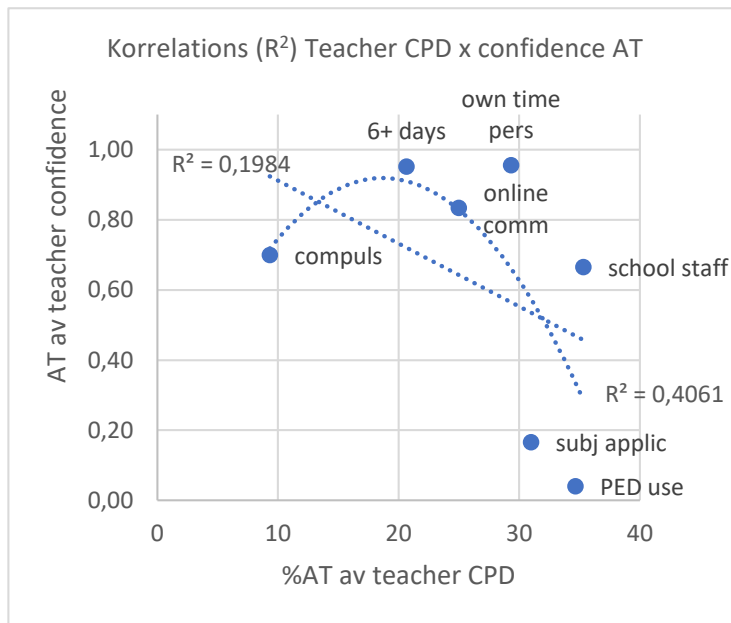
Relationship between teacher CPD participation and confidence in competence in AT and EU



The upper panel shows whole scale and lower panel shows partly increased scale for the competence dimension.

²³ The measurement of teachers' (and students' and parents') confidence is not directly comparable with most other indicators, because it is measured by a 1-4-points score, whereas most other indicators are measured by %-shares; to make the measurements comparable the score has been multiplied*10.

Correlations (R²) between teacher CPD types and confidence about competence in Austria



Legend: ownt time pers=personal learning in own time, school staff=ICT training by school staff, 6+days=6 days or more ICT professional development last two years, subj applic=subject-specific training on applications, PED use=courses on pedagogical use of ICT, online comm=online communities with teachers, compuls=compulsory ICT training

The (indirect) correlations between the amount of participation and the degree of confidence about competences show a negative linear relationship, with two types of CPD with highest participation (training on applications and courses on pedagogical use) more or less unrelated to competence, and – in a non-linear relationship – the informal types (own time personal learning and online communities) and more massive participation in CPD above 6 days are closely related to confidence about competences.

Compulsory training (with lowest participation) and training by school staff (with high participation) lie in between. Looking at the categories of competence in relation to training types (see Annex), the three categories of information/data literacy, communication/collaboration, and solve problems/innovate show similar degrees of confidence related to CPD types (high with personal learning and more massive CPD, low with application training and pedagogical use, the other types in-between).

Confidence with safety and content creation are lower related to most types, exceptions are the types of more massive participation with similar degrees of confidence for all types, and online communities with stronger relationships to these categories, personal learning is also strongly related to content creation.

A look at the emphasis on teachers' IT competences and CPD in Austrian research and policy discourses shows first that in the 2018 NER chapter about teacher CPD²⁴ the supply and demand was analysed by 17 topics-categories, however, IT or media were not considered as a topic-category. The authors explain this by the marginal role of digital provision. The virtual campus of teacher education colleges provides only 2% of courses (340 of ca. 17,000), and in total the provision of digital formats outside of the virtual campus is

²⁴ NER-NBB Nationaler Bildungsbericht (2018) Ch.3 Lehrerfortbildung und Lehrerweiterbildung, by Florian H. Müller, David Kemethofer, Irina Andreitz, Gertrud Nachbaur & Katharina Soukup-Altrichter doi:10.17888/nbb2018-2-3; https://www.iqs.gv.at/_Resources/Persistent/8b35c2997af6b81f1bda58a9be12f8543a6c0649/NBB_2018_Band2_Beitrag_3.pdf

estimated at less than 1%, so a total of 2.8% of digital formats is provided; other sources at regional level show proportions of 4%-to-6%. (NER 2018, p.118-119).

The authors also point to some trend towards increase, however, in their general assessment and conclusions digitalisation is not mentioned as an important topic or need. The chapter also shows that participation of Austrian teachers in CPD is overall rather high in international comparison. However, its duration is very low, and participation is also strongly related to individual preferences of teachers, and not to institutional or systemic development needs. The OECD TALIS study also shows comparatively low incidence of IT-related CPD among Austrian teachers (see Annex).²⁵

The NER 2015 and NER 2018 provide specific chapters about digital education, in 2015 the focus was on teachers' media competence, and in 2018 on competence models for pupils and broader implications of digitalisation.²⁶ The 2015 chapter (p.100-101) argues that recommendations of a strategy group from teacher education colleges²⁷ for the inclusion of digitalisation into new initial teacher education have not been considered, and that digitalisation depended completely on the individual initiative of teacher educators.²⁸

The establishment of comprehensive media competence was recommended as one of three main issues for development of digitalisation in Austria: this was beside the establishment of a common central educational cloud including technical-organisational minimum standards for schools and the overall system, and the development of a broad national research-strategy to counter the ongoing practice of blind flying and trial and error (NER 2015, 120-123).

The NER 2018 chapter gives a broad overview about digitalisation approaches and discusses the changes related to the "School 4.0" initiative from 2017, mainly the integration of many small networks and initiatives to the *eEducation* network and competence centre, and the establishment of the quasi-subject of "*Digital*

²⁵ OECD (2019), TALIS 2018 Results (Volume I): Teachers and School Leaders as Lifelong Learners, TALIS, OECD Publishing, Paris. <https://doi.org/10.1787/1d0bc92a-en>; see also <https://www.oecd.org/education/talis/talis-2018-results-volume-i-1d0bc92a-en.htm>

²⁶ NER-NBB-Nationaler Bildungsbericht (2015) Ch.3 Medienkompetenz fördern – Lehren und Lernen im digitalen Zeitalter, by Peter Baumgartner, Gerhard Brandhofer, Martin Ebner, Petra Gradinger & Martin Korte. doi:10.17888/nbb2015-2-3;

https://www.iqs.gv.at/Resources/Persistent/206aeba5d9c5b51ebd919ef522c074b478cff639/NBB_2015_Band2_Kapitel_3.pdf

NER-NBB-Nationaler Bildungsbericht (2018) Ch. 8 Bildung im Zeitalter der Digitalisierung, by Gerhard Brandhofer, Peter Baumgartner, Martin Ebner, Nina Köberer, Christine Trültzsch-Wijnen & Christian Wiesner doi:10.17888/nbb2018-2-8;

https://www.iqs.gv.at/Resources/Persistent/b8ae8c6c37b9a538ca4784d10862623c87ecdf84/NBB_2018_Band2_Beitrag_8.pdf

²⁷ Bachinger, Gerhard et al. (2013) Weißbuch zum Kompetenzaufbau von Pädagoginnen und Pädagogen für den Umgang mit digitalen Medien und Technologien. In Micheuz, Peter et al. (Eds.) Digitale Schule Österreich. Eine analoge Standortbestimmung anlässlich der eEducation Sommertagung 2013. Österreichische Computer Gesellschaft

²⁸ „Empfehlungen der Strategiegruppe wurden nicht eingehalten [...] Ob und in welcher Intensität sich angehende Lehrerinnen und Lehrer zurzeit mit neuen Technologien und deren effektivem und reflektiertem Einsatz im Unterricht auseinandersetzen, ist auf die Leidenschaft und das Durchsetzungsvermögen einzelner Lehrgangs- und Lehrveranstaltungsleiter/innen an den jeweiligen regionalen Standorten zurückzuführen. Es gibt derzeit kein systematisches und flächendeckendes Aus- und Weiterbildungsangebot im Bereich der digitalen Medienkompetenz für Lehrkräfte.“(NER 2015, 100-101)

Basic Education” (Digitale Grundbildung).²⁹ In relation to teachers and teacher education the autonomous solution meant that no clear and transparent responsibility was created, so in case of the integrated implementation many teachers must instruct pupils beside their subject; it also meant that no clear qualification criteria and no qualification pathway were established.

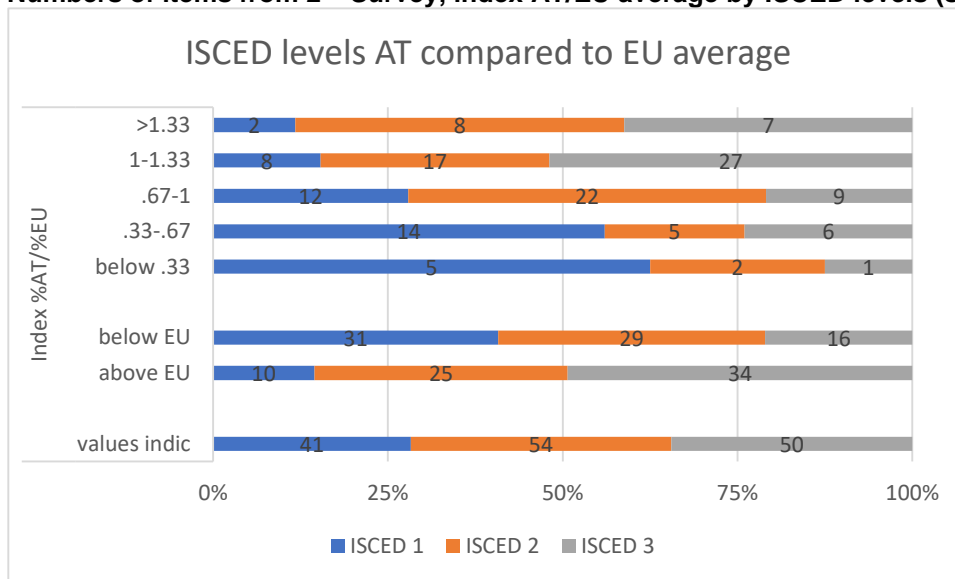
The recommendations of the NER 2018 (p.343-344) chapter include the demand of a clear formulation of necessary qualifications for the subject Digital Basic Education, the provision of media pedagogy as a common part, and formal specialisation of initial and continuing education for teachers, provided by all teacher education colleges (in parallel to inclusive pedagogy). In addition, the digi.comp competences should be made a qualification requirement for all teachers.

²⁹ The subject was established without additional curriculum hours for schools to provide the content autonomously on grades 4-8 with 2-4 hours to be allocated on choice to grades and to be provided separately as a course or integrated into other subjects.

ANNEX

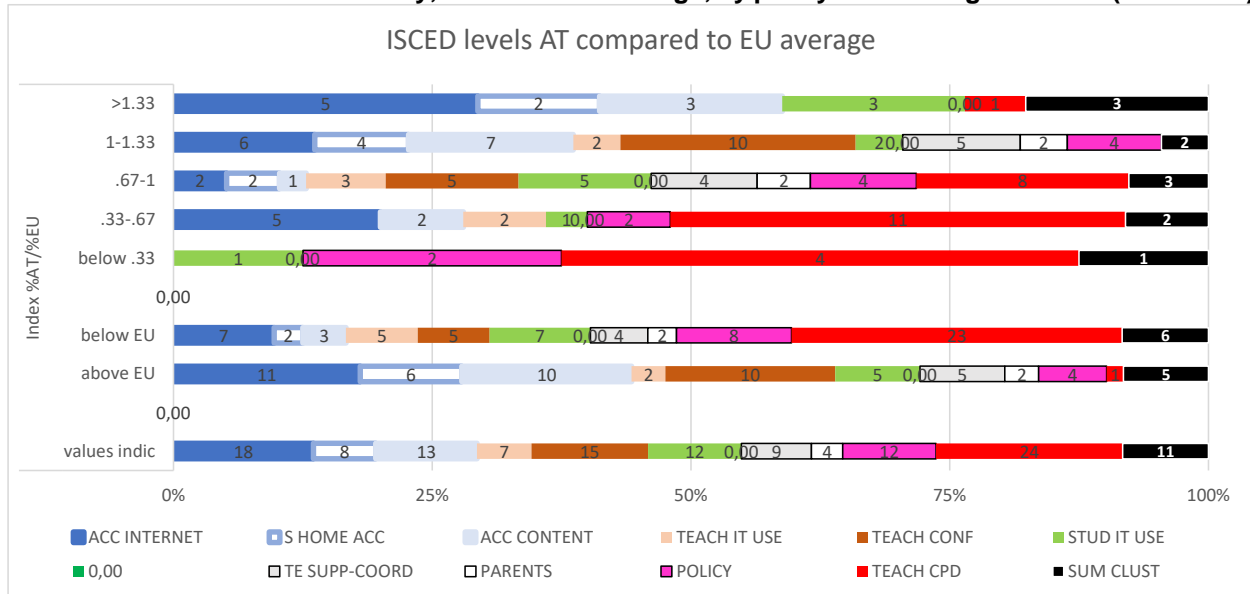
Austrian Position in EU 2nd Survey

Numbers of items from 2nd Survey, index AT/EU average by ISCED levels (see items below)



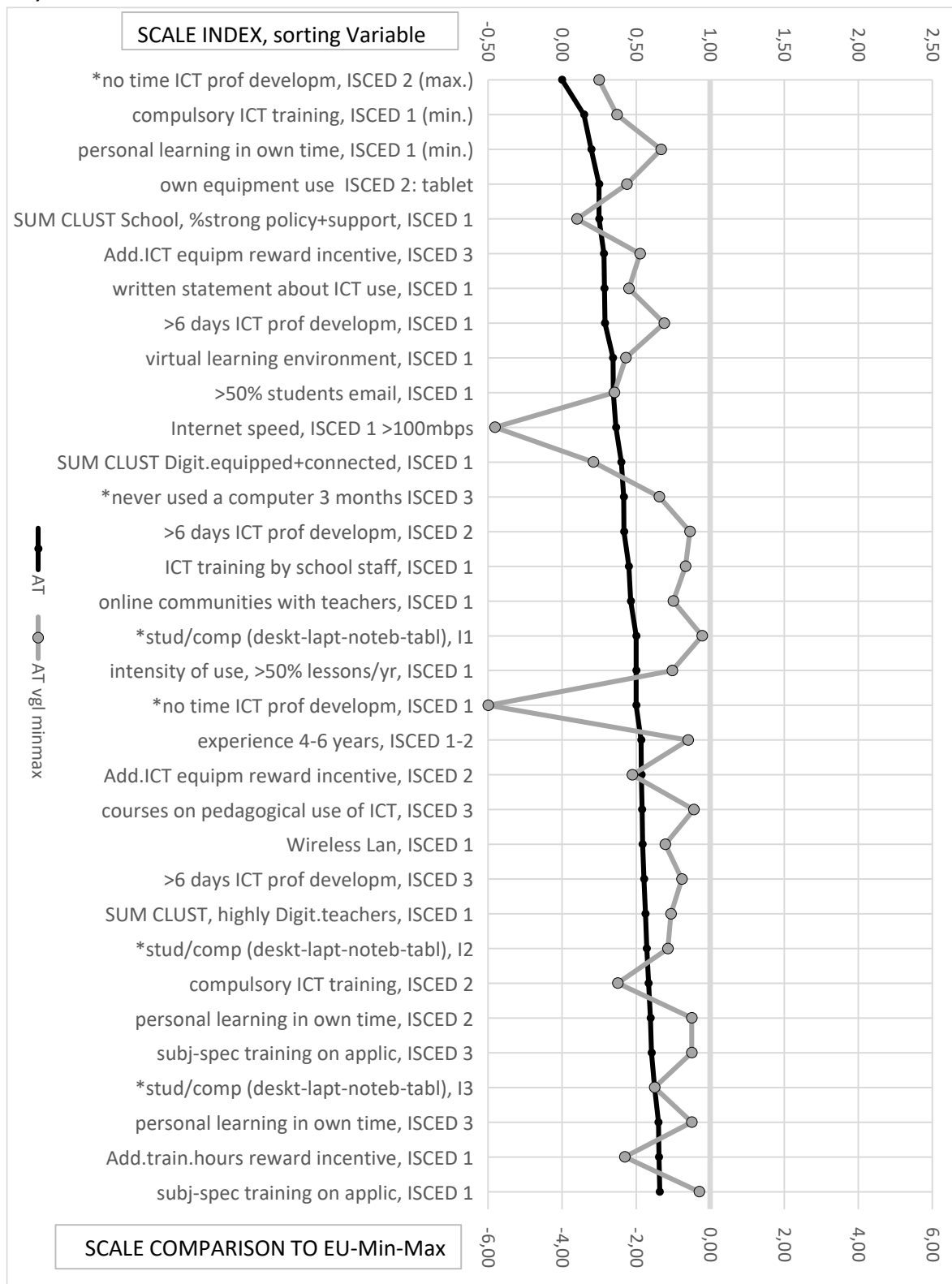
Legend: Index categorized by below .33 (one third of EU), .33-.66 (one third to two thirds of EU), .66-1.00 (two thirds of EU to EU level), 1.00-1.33 (EU level to one third above EU), above 1.33 (more than one third above EU).

Numbers of items from 2nd Survey, index AT/EU average, by policy fields in digitalisation (see below)



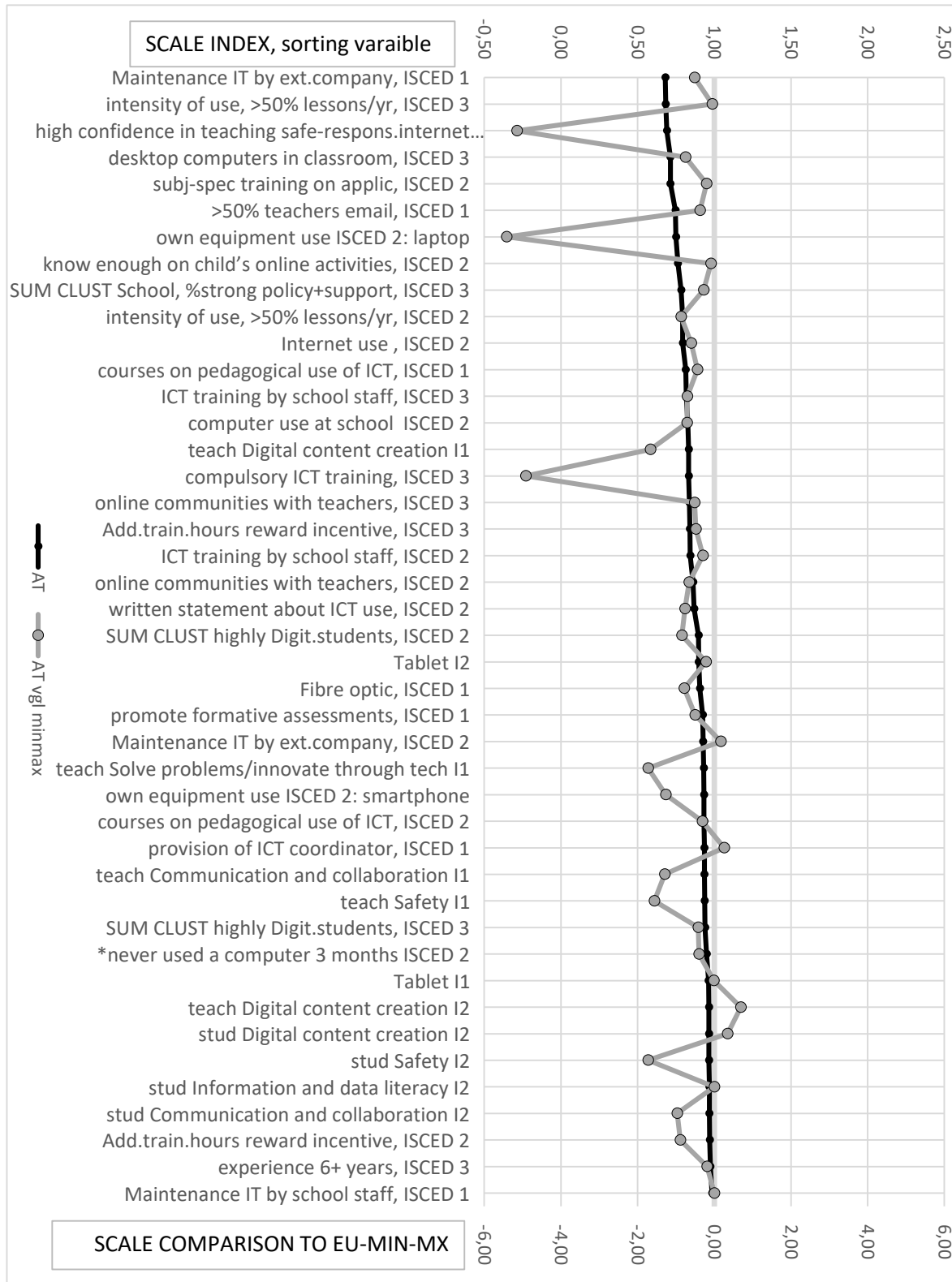
Legend: ACC INTERNET= school access to internet, S HOME ACC=students home access, ACC CONTENT=access to content, TEACH IT USE=teachers IT use, STUD IT USE=students IT use, TEACH CONF=teachers' confidence in IT competences, STUD CONF=students' confidence in IT competences, TE SUPP-COORD=technical support and coordination, PARENTS=parents view about their children IT use, POLICY=schools' IT policy; TEACH CPD=teachers' continuing professional development, SUM CLUST=summarizing cluster analysis

Items substantially below average (Index of Austrian percentages compared to EU-average 0.00-to-.66)



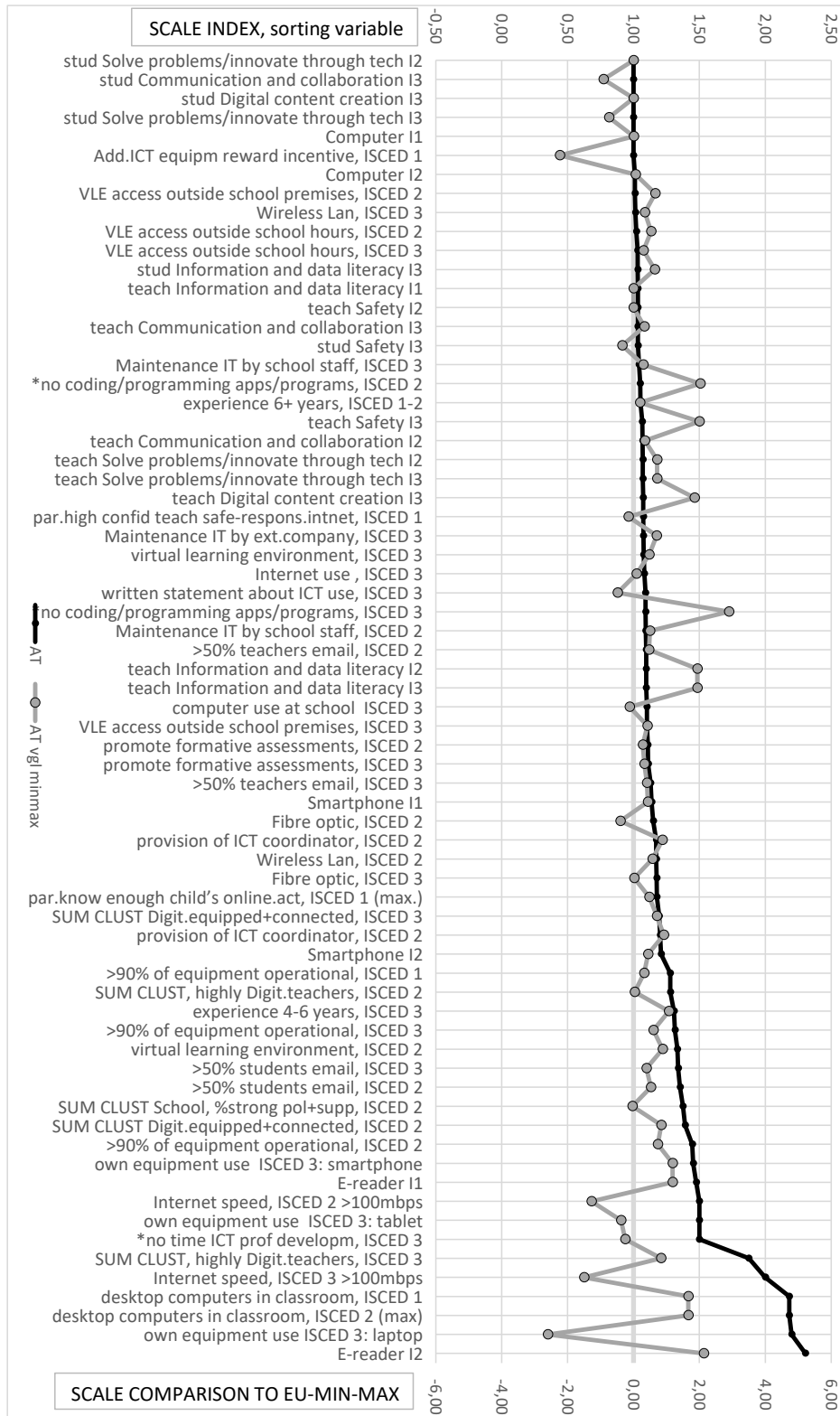
Legend: continuous line Index of Austria/EU-Average, second line/scale Difference to EU Minimum or Maximum country, negative nearer to Min, positive nearer to Maximum; *Variables reverse meaning

Items slightly below average (Index of Austrian percentages compared to EU-average 0.66-to-1.00)



Legend: continuous line Index of Austria/EU-Average, second line/scale Difference to EU Minimum or Maximum country, negative nearer to Min, positive nearer to Maximum; *Variables reverse meaning

Items above average (Index of Austrian percentages compared to EU-average above 1.00)



Legend: continuous line Index of Austria/EU-Average, second line/scale Difference to EU Minimum or Maximum country, negative nearer to Min, positive nearer to Maximum; *Variables reverse meaning

Items substantially below average (Index of Austrian percentages compared to EU-average 0.00-to-.66)

		ISCED 1	ISCED 2	ISCED 3	Min	AT	EU	Max	AT/EU
TEAC CPD	ISCED 2		*no time ICT prof developm, ISCED 2 (max.)		12	0	4	0	0,00
TEAC CPD	ISCED 1	compulsory ICT training, ISCED 1 (min.)			4	4	27	72	0,15
TEAC CPD	ISCED 1	personal learning in own time, ISCED 1 (min.)			12	12	61	93	0,20
STUD USE	ISCED 2		own equipment use ISCED 2: tablet		2	2	8	20	0,25
SUM SCHOOL	ISCED 1	SUM CLUST School, %strong policy+support, ISCED 1			0	5	20	82	0,25
SCHOOL POLI	ISCED 3		<i>Add.ICTequipm</i> reward incentive, ISCED 3		9	11	39	87	0,28
SCHOOL POLI	ISCED 1	written statement about ICT use, ISCED 1			3	10	35	94	0,29
TEAC CPD	ISCED 1	>6 days ICT prof developm, ISCED 1			5	13	45	77	0,29
ACCESS CONTI	ISCED 1	virtual learning environment, ISCED 1			6	11	32	89	0,34
ACCESS CONTI	ISCED 1	>50% <i>students</i> email, ISCED 1			5	10	29	90	0,34
ACCESS INTN-	ISCED 1	Internet speed, ISCED 1 >100mbps			1	4	11	71	0,36
SUM equip-cc	ISCED 1	SUM CLUST Digit.equipped+connected, ISCED 1			3	10	25	96	0,40
STUD USE	ISCED 3		*never used a computer 3 months ISCED 3		2	10	24	51	0,42
TEAC CPD	ISCED 2		>6 days ICT prof developm, ISCED 2		9	23	55	67	0,42
TEAC CPD	ISCED 1	ICT training by school staff, ISCED 1			10	27	60	84	0,45
TEAC CPD	ISCED 1	online communities with teachers, ISCED 1			9	19	41	70	0,46
ACCESS INTN-	ISCED 1	*stud/comp (deskt-lapt-noteb-tabl), I1			21	9	18	1	0,50
TEACH USE	ISCED 1	intensity of use, >50% lessons/yr, ISCED 1			2	21	42	83	0,50
TEAC CPD	ISCED 1	*no time ICT prof developm, ISCED 1			30	1	2	0	0,50
TEACH USE	ISCED 1	experience 4-6 years, ISCED 1-2			2	8	15	23	0,53
TEACH USE	ISCED 2		experience 4-6 years, ISCED 1-2		2	8	15	23	0,53
SCHOOL POLI	ISCED 2		<i>Add.ICTequipm</i> reward incentive, ISCED 2		6	15	28	83	0,54
TEAC CPD	ISCED 3		courses on pedagogical use of ICT, ISCED 3		10	27	50	66	0,54
ACCESS INTN-	ISCED 1	Wireless Lan, ISCED 1			25	25	46	81	0,54
TEAC CPD	ISCED 3		>6 days ICT prof developm, ISCED 3		16	26	47	72	0,55
SUM TEACH C	ISCED 1	SUM CLUST, highly Digit.teachers, ISCED 1			10	18	32	60	0,56
ACCESS INTN-	ISCED 2	*stud/comp (deskt-lapt-noteb-tabl), I2	*stud/comp (deskt-lapt-noteb-tabl), I2		14	4	7	2	0,57
TEAC CPD	ISCED 2		compulsory ICT training, ISCED 2		7	14	24	81	0,58
TEAC CPD	ISCED 2		personal learning in own time, ISCED 2		15	37	62	90	0,60
TEAC CPD	ISCED 3			subj-spec training on applic, ISCED 3	20	29	48	62	0,60
ACCESS INTN-	ISCED 3			*stud/comp (deskt-lapt-noteb-tabl), I3	19	5	8	3	0,63
TEAC CPD	ISCED 3			personal learning in own time, ISCED 3	20	39	60	88	0,65
SCHOOL POLI	ISCED 1	<i>Add.train.hours</i> reward incentive, ISCED 1			3	17	26	91	0,65

Items slightly below average (Index of Austrian percentages compared to EU-average 0.66-to-1.00)

		ISCED 1	ISCED 2	ISCED 3	Min	AT	EU	Max	AT/EU
TEAC CPD	ISCED 1	subj-spec training on applic, ISCED 1			4	29	44	67	0,66
TECH SUPPOR	ISCED 1	Maintenance IT by ext.company, ISCED 1			5	32	47	83	0,68
TEACH USE	ISCED 3	intensity of use, >50% lessons/yr, ISCED 3			19	41	60	66	0,68
PARENTS	ISCED 2	high confidence in teaching safe-respons.internet use, ISCED 2 (min.)			47	47	68	82	0,69
ACCESS INTN-I	ISCED 3	desktop computers in classroom, ISCED 3			10	20	28	51	0,71
TEAC CPD	ISCED 2	subj-spec training on applic, ISCED 2			12	35	49	68	0,71
ACCESS CONTI	ISCED 1	>50% teachers email, ISCED 1			40	56	75	100	0,75
STUD USE	ISCED 2	own equipment use ISCED 2: laptop			3	9	12	80	0,75
PARENTS	ISCED 2	know enough on child's online activities, ISCED 2			20	45	59	75	0,76
SUM SCHOOL!	ISCED 3	SUM CLUST School, %strong policy+support, IS			3	40	51	91	0,78
TEACH USE	ISCED 2	intensity of use, >50% lessons/yr, ISCED 2			12	23	29	59	0,79
STUD USE	ISCED 2	Internet use , ISCED 2			50	54	68	99	0,79
TEAC CPD	ISCED 1	courses on pedagogical use of ICT, ISCED 1			14	35	43	75	0,81
TEAC CPD	ISCED 3	ICT training by school staff, ISCED 3			28	36	44	75	0,82
STUD USE	ISCED 2	computer use at school ISCED 2			32	43	52	91	0,83
TEACH CONFII	ISCED 1	teach Digital content creation			2,4	2,5	3	3,1	0,83
TEAC CPD	ISCED 3	compulsory ICT training, ISCED 3			5	10	12	74	0,83
TEAC CPD	ISCED 3	online communities with teachers, ISCED 3			14	31	37	67	0,84
SCHOOL POLII	ISCED 3	Add.train.hours reward incentive, ISCED 3			3	37	44	92	0,84
TEAC CPD	ISCED 2	ICT training by school staff, ISCED 2			20	43	51	81	0,84
TEAC CPD	ISCED 2	online communities with teachers, ISCED 2			17	25	29	52	0,86
SCHOOL POLII	ISCED 2	written statement about ICT use, ISCED 2			10	33	38	85	0,87
SUM STUD CO	ISCED 2	SUM CLUST highly Digit.students, ISCED 2			19	35	39	84	0,90
STUD HOME A	ISCED 2	Tablet			51	62	69	88	0,90
ACCESS INTN-I	ISCED 1	Fibre optic, ISCED 1			0	29	32	83	0,91
SCHOOL POLII	ISCED 1	promote formative assessments, ISCED 1			11	37	40	83	0,93
TECH SUPPOR	ISCED 2	Maintenance IT by ext.company, ISCED 2			4	38	41	65	0,93
TEACH CONFII	ISCED 1	teach Solve problems/innovate through tech			2,6	2,7	2,9	3,3	0,93
STUD USE	ISCED 2	own equipment use ISCED 2: smartphone			17	28	30	77	0,93
TEAC CPD	ISCED 2	courses on pedagogical use of ICT, ISCED 2			28	42	45	70	0,93
TEACH CONFII	ISCED 1	teach Communication and collaboration			2,7	2,9	3,1	3,5	0,94
TECH COORD	ISCED 1	provision of ICT coordinator, ISCED 1			2	58	62	98	0,94
TEACH CONFII	ISCED 1	teach Safety			2,8	3	3,2	3,7	0,94
SUM STUD CO	ISCED 3	SUM CLUST highly Digit.students, ISCED 3			26	47	50	89	0,94
STUD USE	ISCED 2	*never used a computer 3 months ISCED 2			6	19	20	40	0,95
STUD HOME A	ISCED 1	Tablet			61	78	81	96	0,96
TEACH CONFII	ISCED 2	teach Digital content creation			2,4	2,8	2,9	3	0,97
STUD CONFID	ISCED 2	stud Digital content creation			2,5	2,8	2,9	3	0,97
STUD CONFID	ISCED 2	stud Safety			2,7	2,8	2,9	3,4	0,97
STUD CONFID	ISCED 2	stud Information and data literacy			2,8	3	3,1	3,2	0,97
STUD CONFID	ISCED 2	stud Communication and collaboration			2,9	3	3,1	3,4	0,97
SCHOOL POLII	ISCED 2	Add.train.hours reward incentive, ISCED 2			5	33	34	91	0,97
TEACH USE	ISCED 3	experience 6+ years, ISCED 3			73	78	80	98	0,98
TECH SUPPOR	ISCED 1	Maintenance IT by school staff, ISCED 1			41	70	71	99	0,99

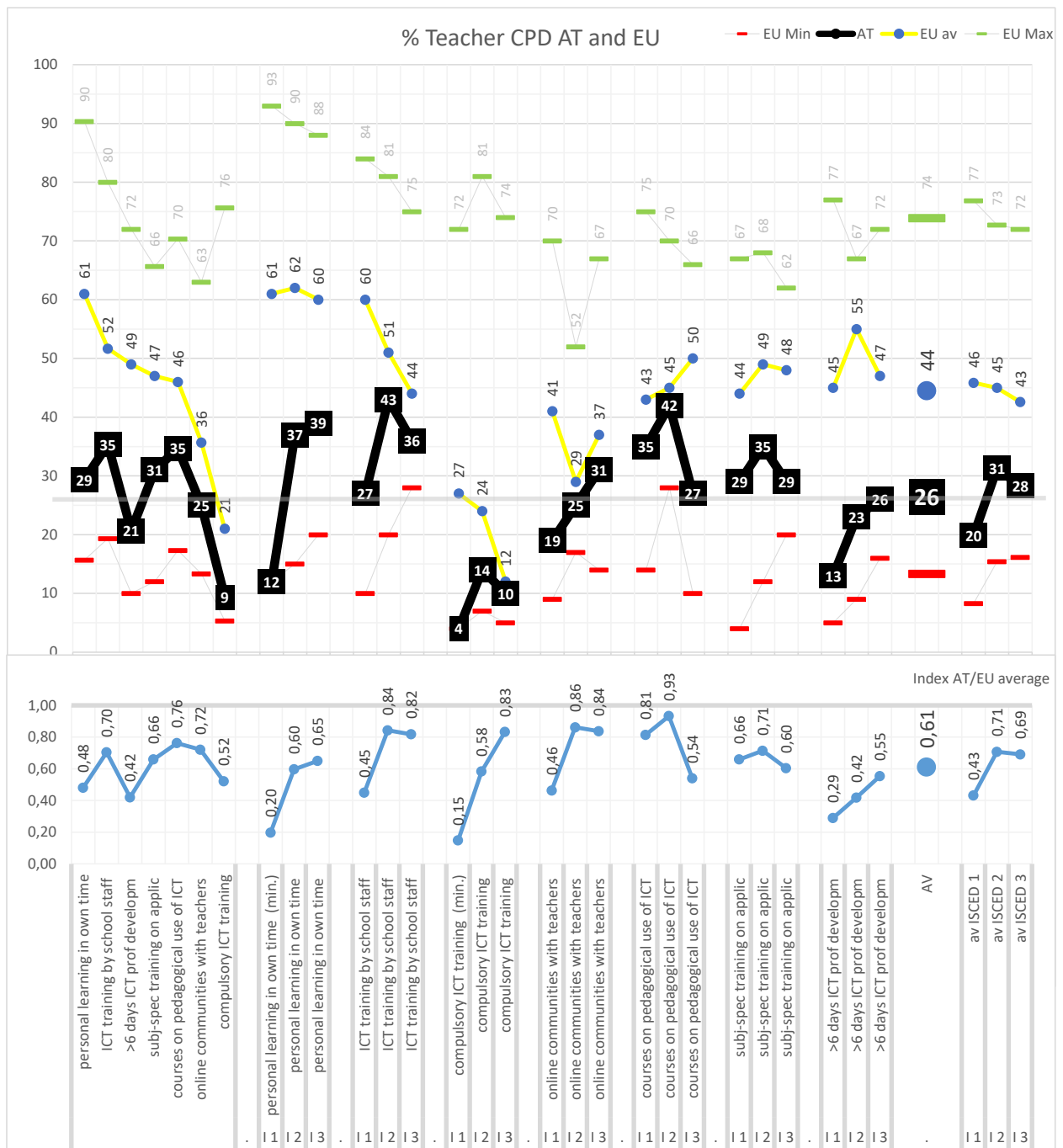
Items slightly above average (Index of Austrian percentages compared to EU-average 1.00-to-1.10)

	ISCED 1	ISCED 2	ISCED 3	Min	AT	EU	Max	AT/EU
STUD CONFID	ISCED 2	stud Solve problems/innovate through tech		2,4	2,7	2,7	3	1,00
STUD CONFID	ISCED 3		stud Communication and collaboration	3,2	3,3	3,3	3,7	1,00
STUD CONFID	ISCED 3		stud Digital content creation	2,3	2,8	2,8	3,3	1,00
STUD CONFID	ISCED 3		stud Solve problems/innovate through tech	2,3	2,7	2,7	3,3	1,00
STUD HOME A	ISCED 1	Computer		84	92	92	99	1,00
SCHOOL POLI	ISCED 1	Add.ICTequipm reward incentive, ISCED 1		5	21	21	84	1,00
STUD HOME A	ISCED 2	Computer		88	97	96	100	1,01
ACCESS CONTI	ISCED 2	VLE access <i>outside school premises</i> , ISCED 2		26	90	89	95	1,01
ACCESS INTN-	ISCED 3		Wireless Lan, ISCED 3	20	68	67	93	1,01
ACCESS CONTI	ISCED 2	VLE access <i>outside school hours</i> , ISCED 2		39	94	92	100	1,02
ACCESS CONTI	ISCED 3		VLE access <i>outside school hours</i> , ISCED 3	67	98	95	100	1,03
STUD CONFID	ISCED 3		stud Information and data literacy	2,7	3,2	3,1	3,5	1,03
TEACH CONFII	ISCED 1	teach Information and data literacy		2,6	3,1	3	3,6	1,03
TEACH CONFII	ISCED 2	teach Safety		2,7	3,1	3	3,5	1,03
TEACH CONFII	ISCED 3		teach Communication and collaboration	2,6	3,1	3	3,5	1,03
STUD CONFID	ISCED 3		stud Safety	2,7	3	2,9	3,4	1,03
TECH SUPPOR	ISCED 3		Maintenance IT by school staff, ISCED 3	68	98	94	100	1,04
STUD CONFID	ISCED 2	*no coding/programming apps/programs during lessons, ISCED 2		89	83	79	61	1,05
TEACH USE	ISCED 1	experience 6+ years, ISCED 1-2		52	79	75	91	1,05
TEACH USE	ISCED 2	experience 6+ years, ISCED 1-2		52	79	75	91	1,05
TEACH CONFII	ISCED 3		teach Safety	2,5	3,2	3	3,3	1,07
TEACH CONFII	ISCED 2	teach Communication and collaboration		2,7	3,1	2,9	3,4	1,07
TEACH CONFII	ISCED 2	teach Solve problems/innovate through tech		2,6	3	2,8	3,2	1,07
TEACH CONFII	ISCED 3		teach Solve problems/innovate through tech	2,4	3	2,8	3,4	1,07
TEACH CONFII	ISCED 3		teach Digital content creation	2,3	2,9	2,7	3	1,07
PARENTS	ISECD 1	high confidence in teaching safe-respons.internet use, ISCED 1		60	72	67	85	1,07
TECH SUPPOR	ISCED 3		Maintenance IT by ext.company, ISCED 3	3	43	40	55	1,08
ACCESS CONTI	ISCED 3		virtual learning environment, ISCED 3	9	70	65	100	1,08
STUD USE	ISCED 3		Internet use , ISCED 3	51	79	73	100	1,08
SCHOOL POLI	ISCED 3		written statement about ICT use, ISCED 3	3	36	33	85	1,09
STUD CONFID	ISCED 3		*no coding/programming apps/programs duri	94	83	76	50	1,09
TECH SUPPOR	ISCED 2	Maintenance IT by school staff, ISCED 2		46	94	86	99	1,09

Items above average (Index of Austrian percentages compared to EU-average above 1.10)

	ISCED 1	ISCED 2	ISCED 3	Min	AT	EU	Max	AT/EU
ACCESS CONTI	ISCED 2	>50% teachers email, ISCED 2		43	91	83	100	1,10
TEACH CONFII	ISCED 2	teach information and data literacy		2,6	3,4	3,1	3,6	1,10
TEACH CONFII	ISCED 3		teach information and data literacy	2,6	3,4	3,1	3,6	1,10
STUD USE	ISCED 3		computer use at school ISCED 3	37	65	59	100	1,10
ACCESS CONTI	ISCED 3		VLE access outside school premises , ISCED 3	57	97	88	100	1,10
SCHOOL POLII	ISCED 2	promote formative assessments, ISCED 2		12	51	46	77	1,11
SCHOOL POLII	ISCED 3		promote formative assessments, ISCED 3	6	50	45	79	1,11
ACCESS CONTI	ISCED 3		>50% teachers email, ISCED 3	57	96	85	100	1,13
STUD HOME A	ISCED 1	Smartphone		49	91	80	98	1,14
ACCESS INTN-I	ISCED 2	Fibre optic, ISCED 2		23	46	40	85	1,15
TECH COORD	ISCED 2	provision of ICT coordinator, ISCED 2		21	95	81	98	1,17
ACCESS INTN-I	ISCED 2	Wireless Lan, ISCED 2		9	61	52	83	1,17
ACCESS INTN-I	ISCED 3		Fibre optic, ISCED 3	19	60	51	100	1,18
PARENTS	ISECD 1	know enough on child's online activities, ISCED 1 (max.)		55	93	79	93	1,18
SUM equip-cc	ISCED 3		SUM CLUST Digit.equipped+connected, ISCED 3	21	86	72	100	1,19
TECH COORD	ISCED 3		provision of ICT coordinator, ISCED 2	18	95	79	99	1,20
STUD HOME A	ISCED 2	Smartphone		60	98	81	100	1,21
ACCESS INTN-I	ISECD 1	>90% of equipment operational, ISCED 1		40	78	61	96	1,28
SUM TEACH C	ISCED 2	SUM CLUST, highly Digit.teachers, ISCED 2		0	32	25	63	1,28
TEACH USE	ISCED 3		experience 4-6 years, ISCED 3	1	17	13	19	1,31
ACCESS INTN-I	ISCED 3		>90% of equipment operational, ISCED 3	51	96	73	97	1,32
ACCESS CONTI	ISCED 2	virtual learning environment, ISCED 2		3	72	54	93	1,33
ACCESS CONTI	ISCED 3		>50% students email, ISCED 3	32	75	56	96	1,34
ACCESS CONTI	ISCED 2	>50% students email, ISCED 2		14	69	51	97	1,35
SUM SCHOOL!	ISCED 2	SUM CLUST School, %strong policy+support, ISCED 2		6	44	32	83	1,38
SUM equip-cc	ISCED 2	SUM CLUST Digit.equipped+connected, ISCED 2		0	71	51	99	1,39
ACCESS INTN-I	ISCED 2	>90% of equipment operational, ISCED 2		40	94	65	100	1,45
STUD USE	ISCED 3		own equipment use ISCED 3: smartphone	4	77	53	87	1,45
STUD HOME A	ISCED 1	E-reader		4	31	21	33	1,48
ACCESS INTN-I	ISCED 2	Internet speed, ISCED 2 >100mbps		2	27	18	75	1,50
STUD USE	ISCED 3		own equipment use ISCED 3: tablet	3	12	8	24	1,50
TEAC CPD	ISCED 3		*no time ICT prof developm, ISCED 3	13	6	4	0	1,50
SUM TEACH C	ISCED 3	SUM CLUST, highly Digit.teachers, ISCED 3		5	45	24	65	1,88
ACCESS INTN-I	ISCED 3		Internet speed, ISCED 3 >100mbps	9	36	18	90	2,00
ACCESS INTN-I	ISECD 1	desktop computers in classroom, ISCED 1		17	72	33	72	2,18
ACCESS INTN-I	ISCED 2	desktop computers in classroom, ISCED 2 (max)		17	72	33	72	2,18
STUD USE	ISCED 3		own equipment use ISCED 3: laptop	8	33	15	97	2,20
STUD HOME A	ISCED 2	E-reader		4	53	23	53	2,30

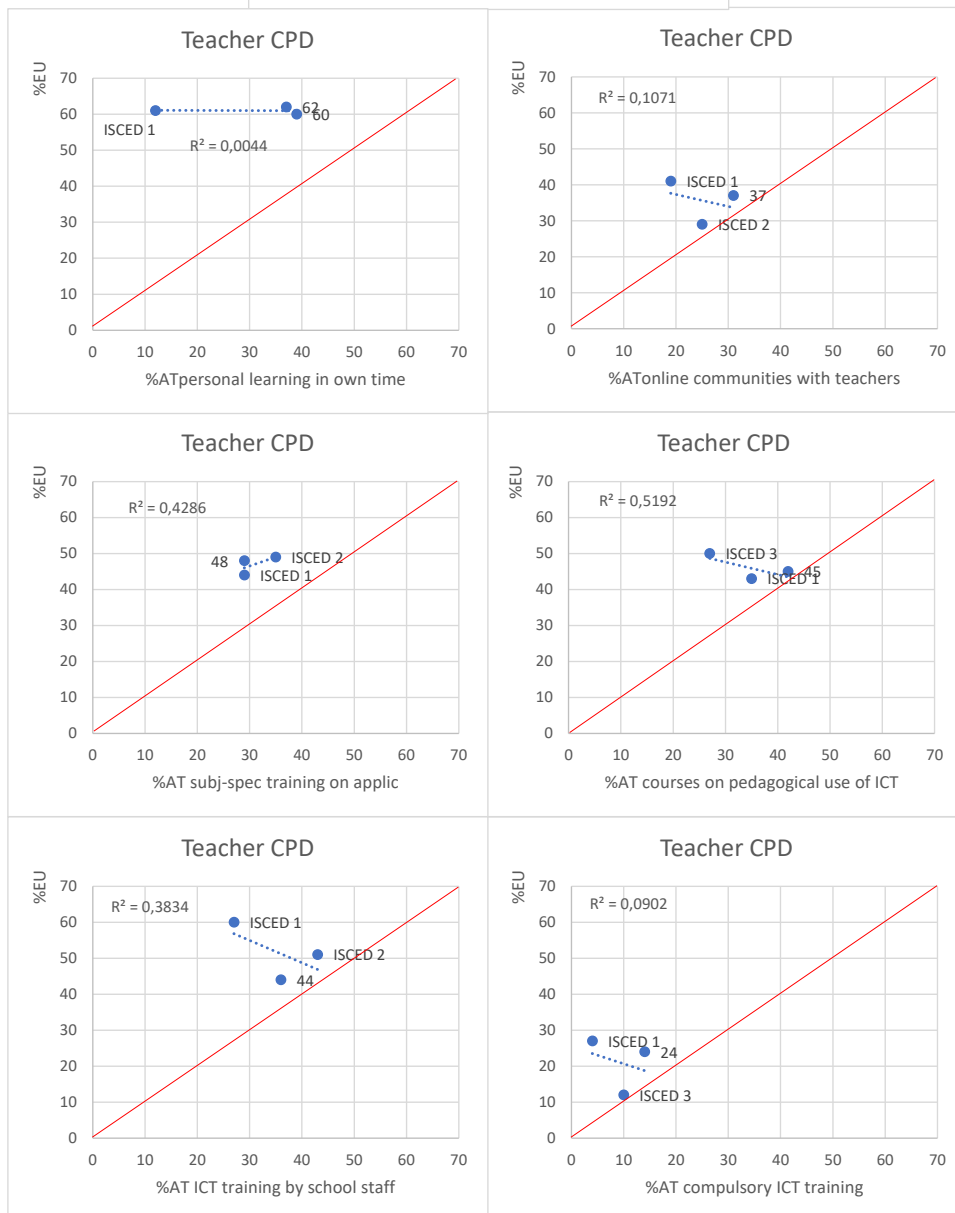
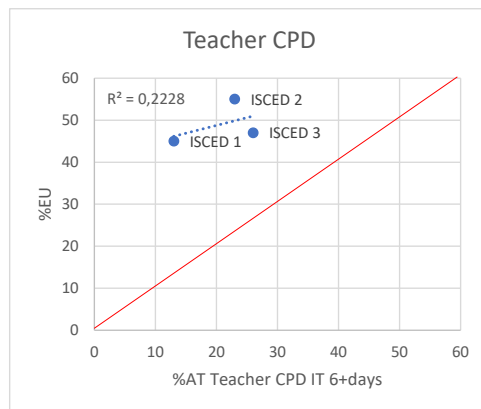
Teacher CPD continuing professional development by ISCED levels



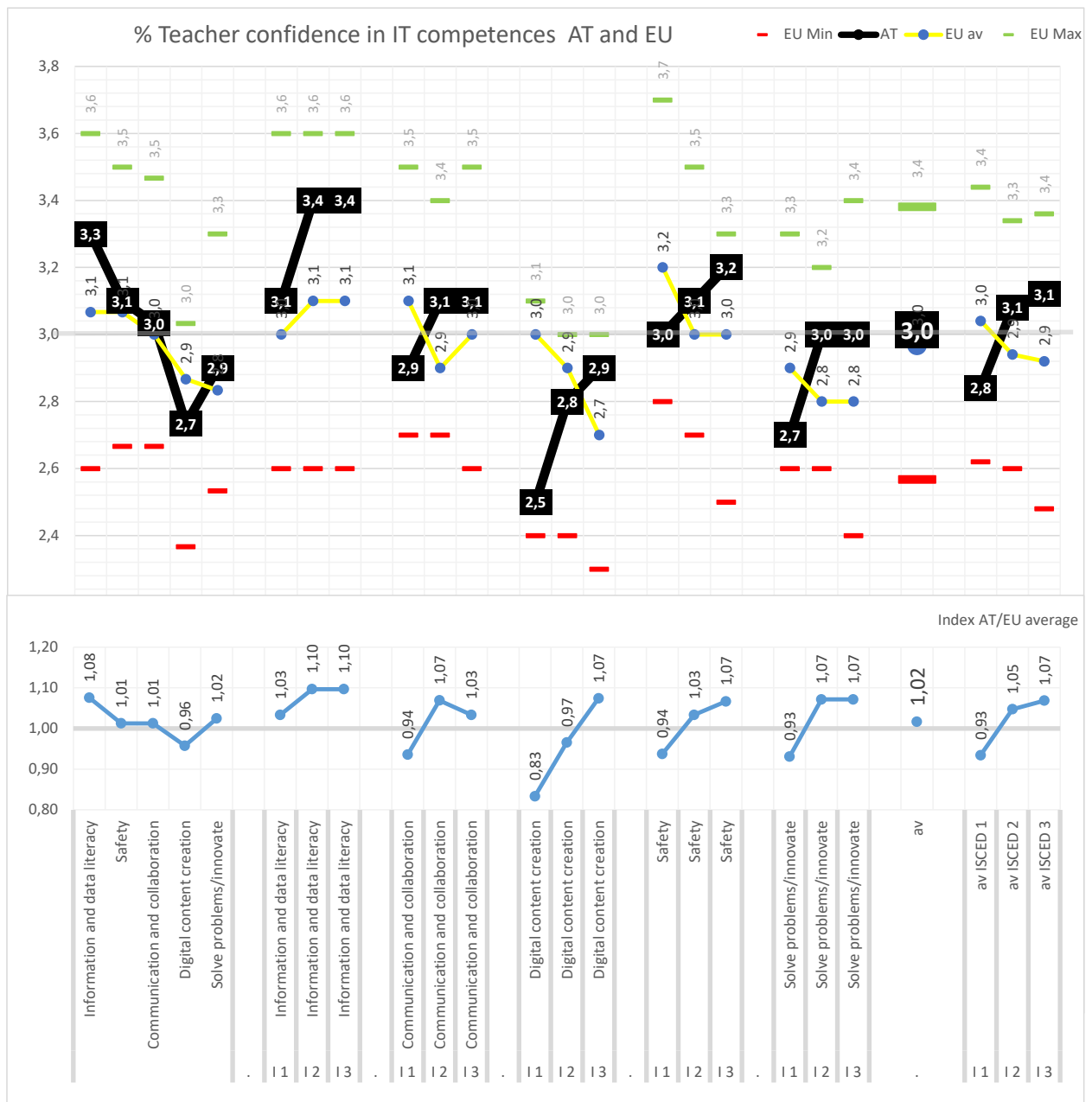
Legend: Comparison of Austrian proportions (AT) to EU average, EU maximum and EU minimum, averages of CPD types across ISCED levels ordered by EU average, index AT/EU average (lower panel)

Source: own analysis of EU 2nd survey

Correlations AT x EU by teacher CPD types



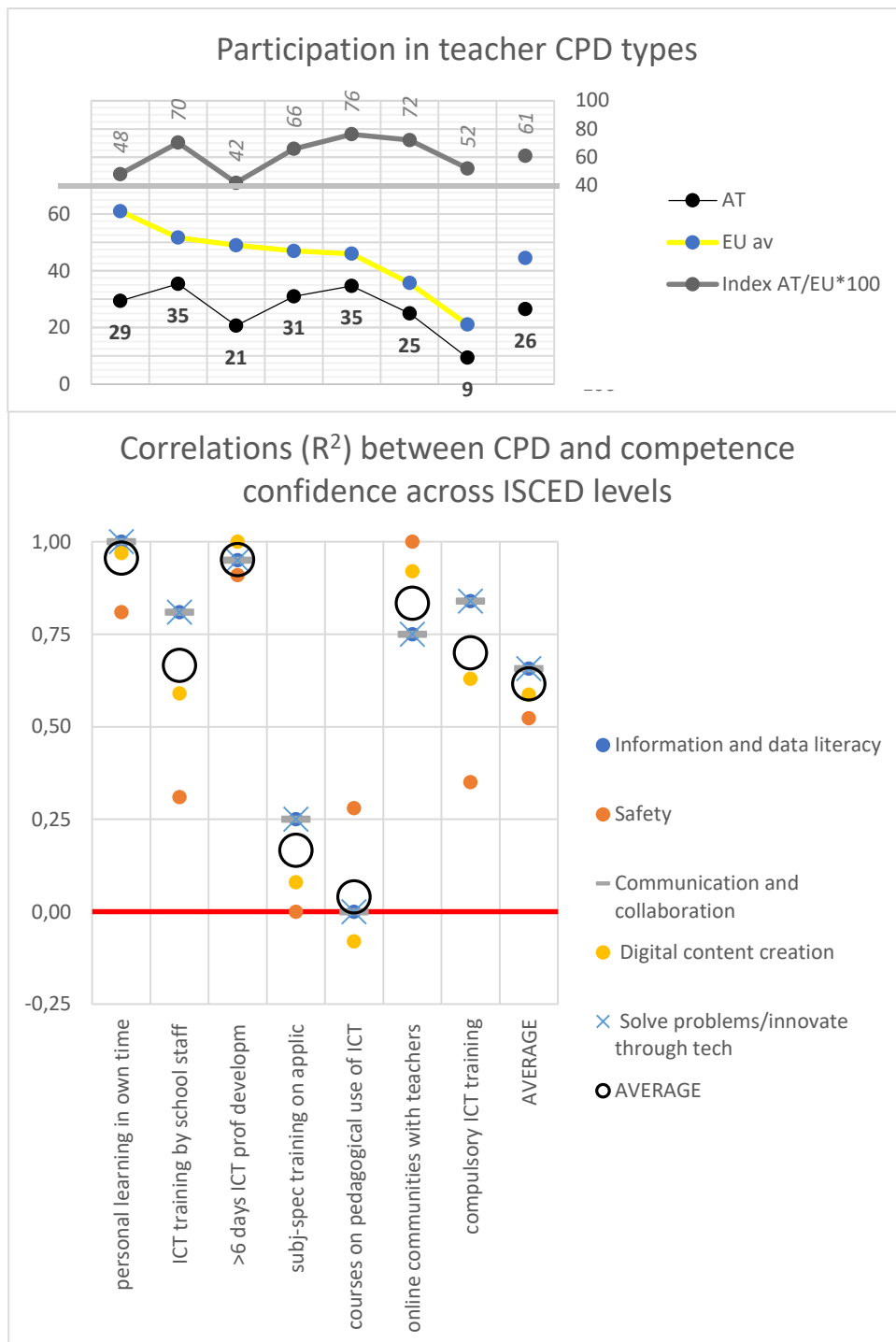
Teacher confidence in IT competences



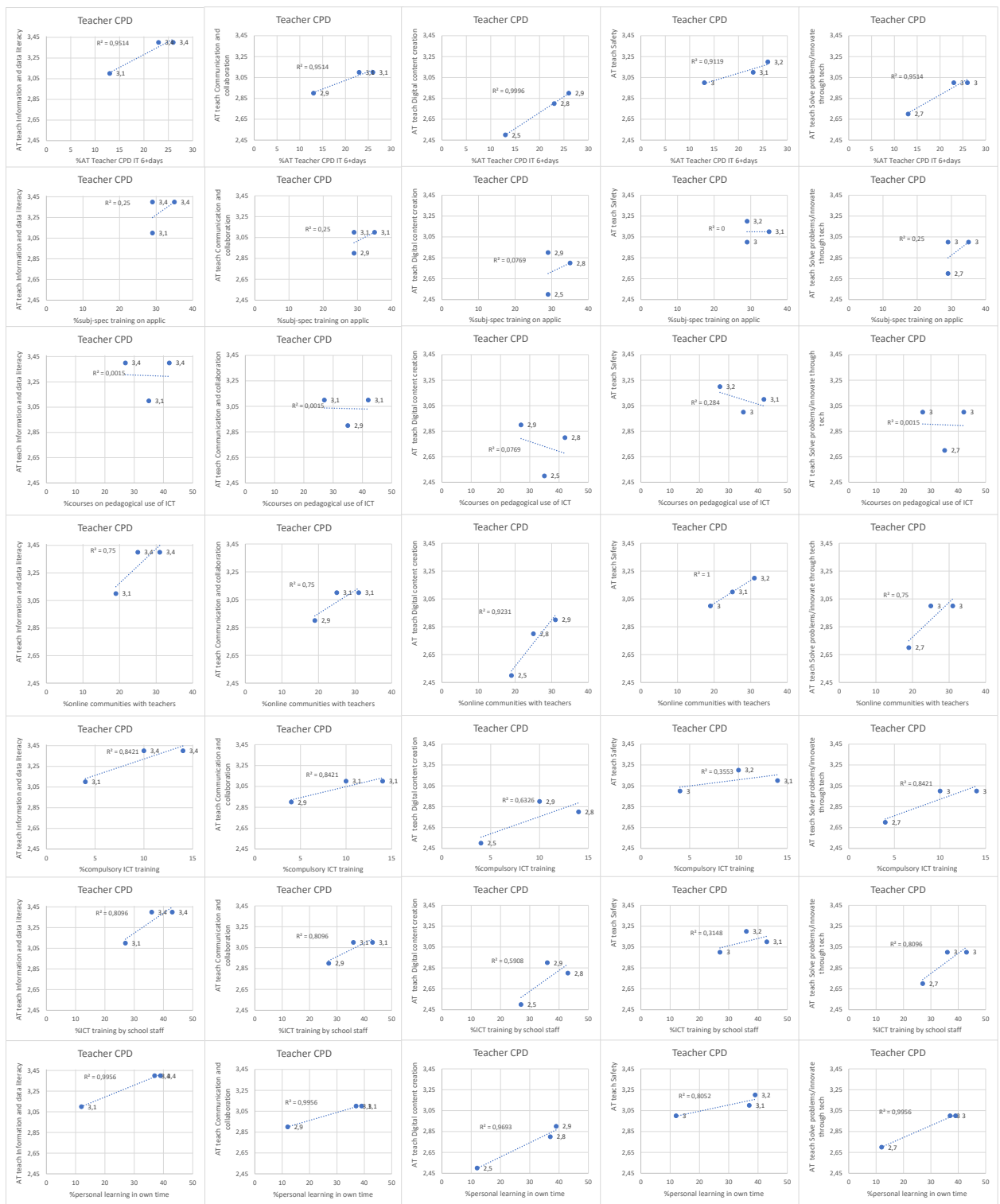
Legend: Score=average of (1)-(4) low to high confidence categories; comparison of Austrian scores (AT) to EU average, EU maximum and EU minimum, averages of competency scores across ISCED levels ordered by EU average index AT/EU average (lower panel)

Source: own analysis of EU 2nd survey

Correlations between CPD and confidence with competences



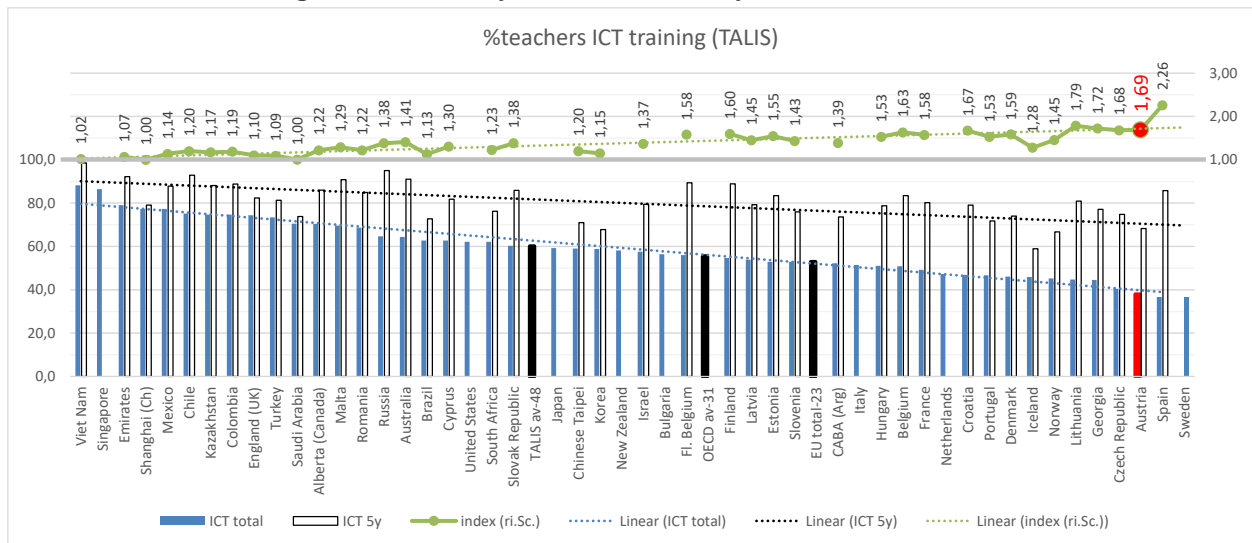
Correlations teacher CPD types and confidence by ISCED levels, Austria



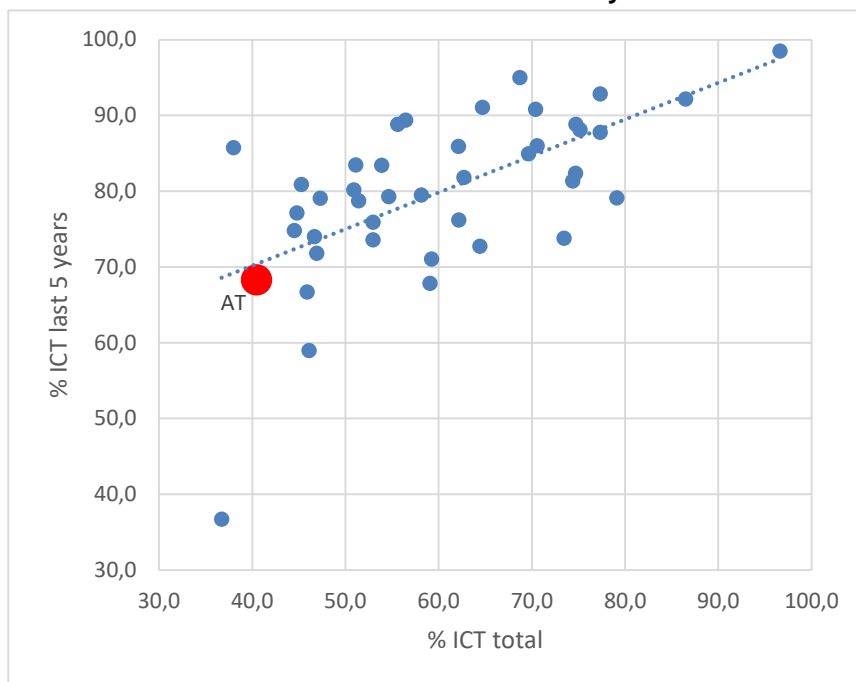
Basis for correlations table in text

Some TALIS results about Austria in perspective

Teachers in ICT training, overall and 5-years before survey

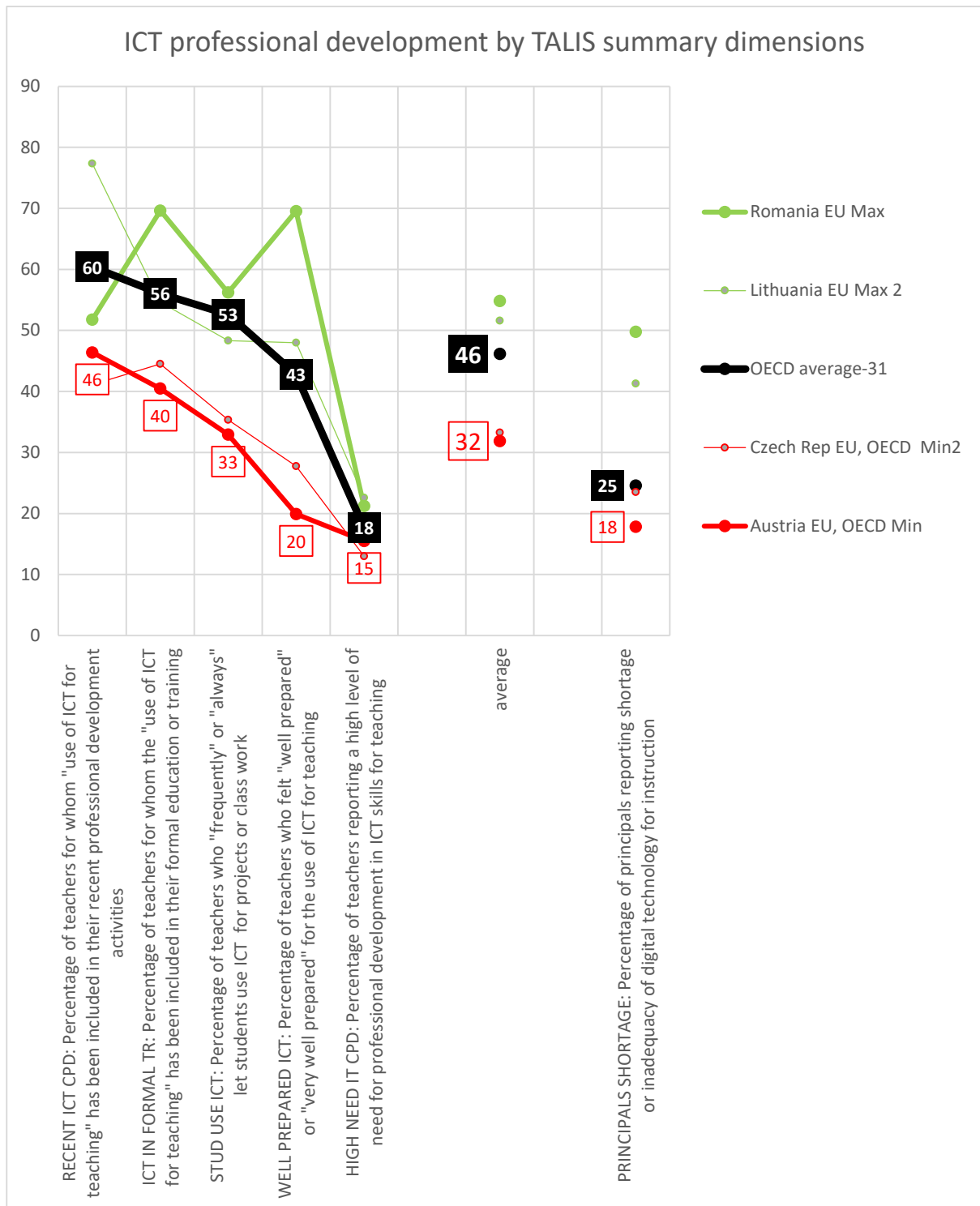


Cross-classification between overall and last 5-years



Source: own analysis of OECD-TALIS Webtable ch.4 <https://doi.org/10.1787/888933933083>

Summary results from TALIS chapters, Austria compared to OECD-average and EU maximum and minimum countries



Source: Statlink to Figure I.1.1 ICT for teaching in OECD TALIS report Vol.1, p.30, <http://dx.doi.org/10.1787/888933931791>