Inclusive Digital Education – The Case of Austria

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Abstract

As part of the Erasmus+ project DigIn, the Austrian project team collected five lesson examples from teachers teaching in inclusive settings to gain insights into the current state of inclusive digital education (European Agency for Special Needs and Inclusive Education, 2022) in practice. In the Austrian school system, around 60 % of all students with special education needs (SEN) attend mainstream schools. Despite that number and different digital education measures implemented by the government, inclusive digital education is still not a government priority.

To gain a better insight into inclusive digital education in Austria, this chapter first presents a general overview of the Austrian school system and the development of inclusive education. This is followed by an overview of what digital education entails in Austria as well as a discussion as to if and how students with SEN are considered within it. Then, the chapter presents findings from an analysis of lesson plans, in which teachers used digital technologies in an inclusive setting.

The results indicate that teachers are aware of the possibilities that digital technologies offer for students with SEN, specifically in catering to their needs by integrating digital technologies in the classroom. But digital technology is mainly used for differentiation in the classroom. Teachers still lack knowledge on how to integrate digital technologies to change the lesson's design and its learning outcome. This is connected to teachers' lack of awareness of the full potential of digital technologies, which are then only partially being used.

The chapter concludes by arguing that raising awareness and offering further training in the field of inclusive digital education is necessary. Moreover, it asserts that government measures should also explicitly address the needs of students with SEN, and the foundations for inclusive digital education must be laid in initial teacher training and professional development programs.

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The Austrian school system and inclusive education

The Austrian school system has nine compulsory school years, which begin at age six in primary school (VS). Children usually finish primary school by age ten. Once primary school is completed, the first "transition" in lower secondary education occurs. When compared with other OECD (Organization for Economic Cooperation and Development) countries, this transition from primary to secondary school at age ten forces children to decide their future educational path at an early age (Nusche et al., 2009). "Tracking" coincides with this first transition, as children either attend the first stage of Academic Secondary School (AHS-U) or the general school type (Secondary School – MS) (BMB, 2017).

The transition to one of these school types depends on teachers' recommendations and students' grades (Luciak & Biewer, 2011). Due to this, these two school types differ in their student composition, with a greater concentration of "A-students" and students from higher socio-economic backgrounds in AHS-U (Bruneforth et al., 2015). Students attending the AHS-U are much more likely to advance to Academic Secondary Schools-Upper Level (AHS-O), colleges, and universities, while students in MS frequently advance to vocational schools and finish school much earlier (Bruneforth et al., 2016). After finishing four years of lower secondary-level education – and to complete the nine compulsory years of education – children must finish one more year of education at the upper-secondary level. In the case of the AHS-U, students usually continue to the AHS-O. Students who attended the MS may finish their compulsory schooling either with a pre-vocational year (PTS) or continue to intermediate- or upper-secondary schools. Intermediate-secondary schools are vocationally oriented and do not qualify for university entry. Upper-secondary schools can be either academically (five-year program) or vocationally (three-year program) oriented and provide access to university education (after a matriculation examination) (Luciak, 2008; Bruneforth et al., 2015). Once compulsory schooling has been completed, Austrian children are usually 15 or 16 years old.

Students with special education needs (SEN) can either attend special needs schools or "receive" inclusive education in kindergarten, primary school, secondary education, and pre-vocational schools. Special needs schools encompass nine school years, where the final year is spent as a pre-vocational year at the PTS. With special permission from the school authorities and school operator, students can attend special needs school for a maximum of 12 years (Bruneforth et al., 2015).

Until the mid-1980s – when the demand for integrative education began – students with disabilities could not be educated in mainstream classrooms but instead received special education at special needs schools. In 1984, due to concerted action by parents and reform-orientated teachers, the first "integration class" for children with and without disabilities was established in the country (Specht et al., 2007). Over the following years, integration

classes expanded across Austria. This led to the amendment of the School Organization Act in 1993, which grounded the right of children with disabilities to attend mainstream primary schools in law. This was an important milestone towards the development of inclusive education in Austria and established parents' right to choose between their child being educated in special schools or (back then) integrative schooling (today's inclusive education). This option for parents was extended to lower-secondary education (children 10 to 14 years old) in 1996 (Specht et al., 2007).

Since these shifts, students with disabilities have mainly been focused on as "students with SEN." Students with SEN are students that are diagnosed by experts as not being able to follow instruction without special support due to physical and/or mental disabilities (§ 8 SchPflG 1985: Bundeskanzleramt, 2016). Students with disabilities are only granted special education support (i.e., material and personnel resources) if they are recognized as having SEN (Specht et al., 2007). Children with SEN are primarily educated in MS (4.5 %) at the lower-secondary level and in PTS (6.8 %) at the upper-secondary level (Statistik Austria, 2022). Since children are separated based on academic achievement at an early age, inclusion at the academic secondary level has been rare.

Now that we have introduced the educational system, we turn to recent developments in the Austrian school system regarding digital education. We introduce Austria's plans for digital education and explore whether students with disabilities/SEN are being considered within these measures.

Digital education in Austria: Specific focus on students with SEN

Austria views digital education through the European Digital Competence Framework (DigComp) (Punie et al., 2013) and the European "Key Competences" definition (Council of the European Union, 2018). Digital education is defined as:

> Basic digital education encompasses digital literacy, media literacy and political literacy. Teaching digital competences enables pupils to select, reflect upon and apply suitable tools and methods for specific scenarios in an academic, professional and private context based on a broad overview of current digital tools. The acquisition of competences in the field of digital technologies is always done in a reflective way and bears in mind the prerequisites and consequences, advantages and disadvantages and social effects of the use of technology (European Commission/EACEA/Eurydice, 2019, p. 26).

This understanding of digital education is reflected in a specific national strategy, the "Masterplan for digitalisation in education." Austria's Federal Ministry of Education, Science and Research (BMBWF) issued this strategy in 2018, aiming to gradually incorporate technological achievements from different society sectors into the educational system. This plan includes five objectives: 1) Innovation in methodology and didactics through pedagogically adept use of digital possibilities; 2) age-appropriate promotion of digital

skills and knowledge as well as critical awareness; 3) increasing interest in technology and technology development; 4) teaching digital skills, competencies, and knowledge needed for a successful transition to the job market; and 5) promoting the creative potential of digitalization among students (BMBWF, 2023a). Although the masterplan refers to all students in all school types, students with disabilities/SEN are not explicitly mentioned.

Intricately connected to the masterplan is the so-called "8-point plan." This strategy was initiated in fall 2020 after Austria's schools struggled for one semester with Covid-19. With the outbreak of the pandemic, having adequate technical equipment in schools and incorporating digital teaching skills suddenly gained importance. The 8-point plan, along with a 250-million-euro budget, was supposed to help schools get out of the "chalk era." The plan set out to equip all federal schools with a fiber-optic-based broadband connection and high-performing WLAN coverage by 2023 (Digitale Schule, 2020a). By the 2021/22 school year, moreover, students and teachers at the lower secondary level (5th to 8th grade) should be equipped with digital devices (Digitale Schule, 2020b). There is also a "seal of approval" initiative for learning apps that meet criteria such as being platform-independent, compliant with general data protection regulation, and ad-free (Austrian Agency for International Cooperation in Education and Research [OeAD], 2022). Lack of accessibility or usability, however, does not disqualify the app for the seal, perhaps unintentionally revealing that students with SEN are not a priority within this initiative. Other measures, such as the "digi.komp initiative" have been promoted in the Austrian educational sector for over 10 years. This initiative encompasses four competence models for digital competencies and implementation (BMDW, 2021, p. 18). For each model, an equivalent evaluation tool called digi.check exists, which helps students and educators get an overview of their digital competencies (BMBWF, 2019).

While engaging with the topic of digital competences was initially voluntary in the educational system, it is nowadays integrated step by step in lessons plans and curricula (BMDW, 2021). As a result, as of the 2022/23 school year, the new compulsory subject "Digital Literacy" has been introduced in lower secondary schools with at least one fixed hour in the timetable, resulting in a total of at least four hours per week (BMBWF, n.d.). In primary schools, the newly published curriculum (BMBWF, 2023b) contains new digital education features. In it, informatics and media education are implemented as cross-curricular topics. The focus is on media education and reflective use of the internet as well as a playful approach to technology and problem solving. The curriculum explicitly also points out the benefits of digital media in working with students with disabilities/SEN (e.g., increase of method variety, promotion of different students', etc.) (BMBWF, 2023b, p. 5). Explicit measures for students with disabilities/SEN, however, are not mentioned.

In the 2016/17 school year, the Ministry of Education initiated the eEducation Austria network (Riepl & Steinkogler, 2021; Brandhofer et al., 2019). The creation of an Austria-wide community for building digital literacy in the education sector was the underlying

idea (Brandhofer et al., 2019). The fundamental goal of the eEducation initiative is to bring digital competences into all Austrian classrooms. This vision is based on three pillars: 1) digital competencies development; 2) lesson development; and 3) organizational development (eEducation Austria, n.d.). The concept envisages schools joining the network on a voluntary basis but with the goal of embarking "on the digital journey" (Riepl & Steinkogler, 2021, p. 190). On a platform, schools document activities that they have carried out in the digital field. Forty activities across eight categories are available. For each activity, schools collect badges or points. Although the badges include the category "Use of innovative and inclusive teaching methods," they only refer to gender-sensitive didactics and reflexive co-education (eEducation Austria, n.d.). A focus on aspects that might be specifically relevant for students with disabilities/SEN (i.e., accessibility, usability, or assistive technologies) are not mentioned. As of December 2022, the network consists of 3,940 schools (eEducation Austria, n.d.), of which 132 are special needs schools.

Inclusive digital education in Austria's classrooms: Analysis of lessons

Although Austria has started various initiatives to support the use of digital technology in the educational sector, most of these are not targeting students with disabilities/SEN. Neither inclusive education with digital technologies nor supporting students through assistive technologies are promoted by these measures, although the use of digital technologies offers great opportunities for the further development of inclusive education (Bosse & Eggert, 2019; Bešić & Holzinger, 2020). To explore teachers' use of digital technology in inclusive settings (where students with and without disabilities/SEN are taught in the same classroom), we collected lesson examples from teachers within the DigIn project from the four participating countries. The next section analyzes those examples from Austria and also describes the analysis process for all of the case studies that are included in this book.

Method

The lesson setting

All lessons used took place in a face-to-face inclusive classroom setting in primary schools (2nd and 4th grades). At least one student with disabilities was enrolled in each class. The disability type referred to various expressions of autism spectrum disorder, attention deficit disorder, learning disabilities, cognitive disabilities, and epilepsy with severe intermittent mental absences. Three of the seven students had a school assistant. The lessons were in mathematics (practicing multiplication, perimeter, and area), German (spelling, reading), and general science (animal protection day). An overview of the lessons (context, teaching method, digital tools used) is shown in Table 2.

Participants

The lessons were collected from five female primary school teachers teaching in inclusive settings in five primary schools. We have used purposive sampling and selected participants according to three criteria: 1) at least one year of experience in teaching students with disabilities/SEN in an inclusive setting; 2) experience in using digital technology; 3) and the lesson was held in an inclusive setting.

Data collection procedure and instrument

To collect at least five examples in Austria, we contacted 30 teachers between March and May 2022 via email who were known to the authors from previous projects, teacher trainings, or university courses. Participation was voluntary. Six responded positively and were asked to provide an example. By April 2022, the participating teachers received guidelines within a template for describing their lesson example, ensuring comparability between the examples. They were asked to comment on 13 areas within the template, such as lesson objectives, the method or approach used, classroom setting, digital technology used, and challenges and opportunities in using digital technologies. Teachers had one month to complete the template. The examples were then reviewed by the project members for compliance and five were chosen for this analysis. In case of open questions, teachers were asked to revise their example.

Data analysis

All lesson examples were coded and analyzed through directed qualitative content analysis (Flick, 2014). The analysis-criteria included the educational goals for the 21st century and the frameworks for using technology in classrooms. In this way, it was ensured that both aspects – inclusive education and digital education – were considered when analyzing the lesson examples.

The first category, "Learning Objectives in the Competence Areas," refers to the five pillars of education and the competence areas important for educational quality. The second, "Didactic Adaptivity," focuses on differentiation in the classroom. The third, "Tool Accessibility," describes whether teachers are aware of the accessibility features of the digital technology used. The fourth, "SAMR-Model," describes different degrees of classroom technology integration. The fifth category, "4 Cs," analyzes whether teachers are considering 21st century learning skills within their lesson plan, and whether they are using digital technologies to incorporate them into their lessons.

We used deductive coding and created a coding list with code explanations before the analysis began. This was used by all DigIn project partners to analyze the lesson examples from their country. The authors of the respective chapter coded the data. Coding conflicts

were resolved in a feedback loop between the whole DigIn research team after all examples had been coded. The codebook can be seen in Table 1.

Table 1: The Codebook

Category	Description	Coding guideline
Learning Objectives in the Competence Areas Delors (1996); Schratz & Weiser (2002)	• Learning to know • Learning to understand • learning to do • Learning to work together • Learning to be	Analyze and describe the text related to learning objectives. How are the learning objectives described? Do the teachers consider the description ("learning to know," etc.)?
Didactic Adaptivity König, Buchholtz & Dohmen (2015)	• Differences of the learning group regarding their learning requirements • Differentiation of the task regarding differences of the students with disability • Previous specific learning level of the students with disabilities regarding the lesson task • Linking of grouping students and differentiation	Analyze and describe the text related to didactic adaptivity – individualization and differentiation of the lesson/parts of the lesson. How is this described.
Tool Accessibility Freed & Rothberg (2006)	Independent of the disability • Voice over • Dictation • Alternative text • Zoom function • Contrast of color • Font enlargement • Easy-to-read text • Difficult version for choice	Analyze and describe the text related to describing accessibility aspects of the used digital technology – is it described? How?
SAMR-Model Puentedura (2006)	• Substitution • Augmentation • Modification • Redefinition	At which level do teachers integrate technology into the classroom? Identify the degree for each lesson example, and write a summary about that.
4 Cs P21 (2002)	• Creativity • Communication • Critical thinking • Collaboration	Are the teachers referring to the 4Cs? Are they referring to one or more of these competences?

Findings

Learning objectives in the competence areas

Within the objective description, teachers mainly focused on the "learning to know" (learning to learn) and "learning to do" pillar of education for the 21st century (Delores, 1996). It was important for them that students learn how to gain (in-depth) knowledge, and work independently at their own pace and according to their individual performance level. One teacher described this as follows: *"The lesson goals are working independently as well as teaching simple working and learning techniques that will increasingly enable independent acquisition of knowledge"* (teacher, example 2). In addition, whenever possible, students had the chance to choose the content themselves. In three examples, "learning to work together" was defined as an objective. It is important to note that acquiring digital competences were not mentioned as lesson objectives although they were described within the lesson approach (and hence included in Table 2 during the analysis). The reason for this might be that the teachers formulated the learning objectives according to the primary school curriculum, which at that time did not address digital education features. Nevertheless, teachers did stress the importance of students' familiarity with digital technologies, which is, according to Autenrieth and Nickel (2020), an important basis for knowledge acquisition.

Didactic Adaptivity

Teachers stated that differentiation is needed in inclusive settings (Kurth et al., 2015). Teachers' competence in creating lesson plans that meet students' needs are therefore important (König et al., 2015) as the following statement illustrates:

> One student has an autism spectrum disorder. He is very interested in technical work and is very skilled with his hands. However, he has great difficulties in German and math. Reading comprehension is especially a problem. The "Anton app" helps him solve mathematical tasks because he can hear the task description. There is also a "hint" button providing useful information for solving the task. This way the student does not have to constantly rely on support from his classmates or me (teachers, example 5).

The lesson description also showed that by including differentiation within the lesson plan creation, no adjustments needed to be made while conducting the lesson. Teachers differentiated their lesson by adjusting the content (i. e., adjusting the complexity level, providing materials at varying reading levels) and the process (i. e., presenting text through both auditory and visual means, providing different levels of support and complexity of activities, working in pairs or small groups, media use). The methods of differentiation were mainly related to the students' individual education plan. Only one teacher did not link the differentiation method to a specific student with SEN but to the whole class. In all lessons, all students were able to choose the content, material, and the product of the lesson.

According to the teachers, differentiation, specifically by using digital media, had a positive effect on students' learning motivation and concentration. In all examples, it was pointed out that using digital technology was enjoyable for the students and had a motivating effect on their learning behavior: *"The students especially enjoyed teamwork, working with a laptop, and answering questions using 'LearningApps.' More than half of the students enjoyed creating the mini-presentation and presenting it to their classmates"* (teacher, example 4), and *"Their motivation to learn and enthusiasm were clearly perceptible"* (teacher, example 2). One teacher also mentioned the increase in concentration for a longer period of time as a positive effect of learning with digital technologies.

Tool Accessibility

Using digital technologies helps teachers achieve differentiation. As one teacher stated: *"The app covers different learning types, such as auditory and visual, and can be used in a very differentiated and individual way"* (teacher, example 2). Differentiation through digital technologies can also mean taking accessibility into account. Two teachers stressed that they use a platform that lets them respond more to student needs since they can adjust the text and associated questions within the tool. They could reduce text length, increase font size, and simplify the text and questions as needed to make the content accessibly to students.

Teachers chose digital technologies to provide students a meaningful learning experience. This meant that they considered the needs of students with SEN but also kept in mind the inclusive setting (i. e., the app or platform was usable for all students). They chose only digital technologies that included specific accessibility (i. e., text-to-speech software, screen magnifier, voice output) and usability features (i. e., adjustable color coding and contrast). They also justified the digital technology choice by students' familiarity with it. Hence, they mainly used digital technologies that students had worked with before (e. g., PowerPoint and Word, children's search engine, Word Pro, Anton App).

SAMR-Modell & 4Cs

Regarding the classification levels proposed in the SAMR model (Puentedura, 2006), teachers stayed at the enhancement step and the lessons were at the substitution (level 1) and augmentation (level 2) levels. At the substitution level, tasks do not differ functionally from analogue materials and present a digital substitute for them. For example, students type on a digital device instead of writing in a notebook. On the augmentation level, digital technologies offer additional possibilities or specific improvements (e. g., automatic spell check, assistance in the form of hints, or accessibility improvement).

When asked to evaluate how they use digital technology to respond to the 4Cs (P21, 2022), teachers struggled to link them to their lesson plan (i. e., learning objectives). Overall, all 4Cs were mentioned but not by all teachers: communication (n = 2), critical think-

ing (n = 3), collaboration (n = 3), and creativity (n = 3). Developing "communication" and "critical thinking" competencies was seen as a result of the methodical design of the lessons, "collaboration" was encouraged through working in small groups, and "creativity" was supported by the possibility to discover learning and create products with digital technologies.

Table 2: Lesson Overview – Analysis

N	Context	Subject and Objectives	Teaching method	Digital tool(s)	4 Cs of 21st Century Education (P21, 2002)	SAMR-Model (Puentedura, 2006)
1	2nd grade primary school – 14 students, included 1 with intellectual disability and 1 with attention deficit disorder (ADD) Face-to-face class	Math (1) Multiplication training (2) Learning at students' own pace and according to their skill level.	(1) Independent learning according to a weekly plan	Learning-Apps	Creativity	Augmentation
2	2nd grade primary school – 13 students, included 1 with learning disability Face-to-face class	German (1) Improving reading and spelling skills (2) Expanding students' vocabulary (3) Learning according to students' skill level.	(1) Individual work – Running dictation, working with an App, Worksheet	Wörter-Profi	Critical thinking	Augmentation
3	4th grade primary school – 24 students, included 1 with autism spectrum disorder	General Sciences (1) Fostering students' digital literacy skills – finding information (2) Strengthening students' relationships and collaborative skills (3) Improving students' presentation skills	(1) Frontal lesson (2) Group Work – students joined a group according to similar interest	(1) Search engine "Frag-Finn" (2) Text editor (3) Power Point	Creativity Communication Critical thinking Collaboration	Substitution

4	2nd grade primary school – 13 students, included 1 with attention deficit disorder and learning disability and 1 with epilepsy	General Sciences (1) Enhancing students' reading skills (2) Strengthening students' relationships and collaborative skills (3) Fostering students' digital skills – using a touchpad and keyboard (moving the cursor, typing, selecting, etc.).	(1) Frontal lesson (2) Individual work (2) Group work	Learning-Apps	Collaboration Creativity Communication	Augmentation
5	4th grade primary school – multilevel class – 7 students, including 1 with autism spectrum disorder	Math (1) Enhancing students' mathematical skills	(1) Frontal lesson (2) Group work – with text book (3) Individual work with an App	Anton app	Collaboration Critical thinking	Augmentation

Conclusion

Teachers still struggle to provide a lesson plan for inclusive digital education. This was shown specifically in the description of the lesson objectives. These mainly referred to the competence of "learning to do" (Delors, 1996) but did not consider digital competences that students should acquire. Furthermore, teachers mainly described digital technologies as useful for differentiation.

Although the analysis presented in this chapter is only based on a small data sample, it indicates that measures at different levels will be necessary to exploit the full potential of integrating digital technologies in inclusive teaching and learning.

When considering the SAMR model – a practical guide for classroom technology integration – it was noted that teachers remained at the enhancement steps (substitution level and augmentation level). Although functional improvements can be achieved on these two levels, digital technologies only unfold their full potential when transformation (modification level or redefinition level) of teaching takes place with the aim of enabling students to perform tasks that would not be possible without digital technology integration (Puentedura, 2013). The Austrian eEducation approach seems well suited to supporting this transformation by helping teachers gain digital competences and promoting (digital) classroom and school development (Riepl & Steinkogler, 2021). However, this approach needs to be explicitly extended to the needs of students with SEN.

Accessible digital technologies and learning materials must also be provided. Accessibility should be a criterion for the seal of approval for learning apps and anchored in the government's 8-point plan. In addition, primary schools and special needs schools should also be equipped with digital devices so that students with disabilities are well-equipped throughout all levels of the education system (Digitale Schule, 2020a).

As the European Agency for Special Needs and Inclusive Education (2022, p. 8) states, it is also important to include inclusive digital education within the education system:

> In inclusive education systems, this entails addressing inclusion, exclusion, digitalisation and the digital divide as interconnected and inter-dependent cross-cutting issues. This is vital if digital education is not just to be implemented for some, but is to be permanently anchored in the education system's structures to foster resilient educations systems that provide equitable education opportunities for all learners.

In particular, inclusive digital education should be seen as a central task of teacher training institutions, colleges, and universities.

References

Austrian Agency for International Cooperation in Education and Research (OeAD) (2022). *Lern-Apps*. OeAD. https://lernapps.oead.at

Autenrieth, D. & Nickel, S. (2020). Kultur der Digitalität = Kultur der Partizipation: Herausforderungen für Gesellschaft, Schule und Unterricht des 21. Jahrhunderts. *Medienimpulse, 58(4),* 1–32. https://doi.org/10.21243/mi-04-20-13

Bešić, E. & Holzinger, A. (2020). Fernunterricht für Schüler*innen mit Behinderungen: Perspektiven von Lehrpersonen. *Zeitschrift für Inklusion, 3.* www.inklusion-online.net/index.php/inklusion-online/article/view/580

Bosse, I. & Eggert, S. (2019). Digitale Bildung inklusiv: Konzepte und Qualifizierung. *Zeitschrift für Medienpädagogik,* 5, 1–4.

Bundesministerium für Bildung (BMB) (2017). *Bildungswege in Österreich 2016/17. [Educational Paths in Austria 2016/17].* BMB. https://www.bmb.gv.at/schulen/bw/ueberblick/bildungswege2016.pdf?61ec1o

Bundesministerium für Bildung, Wissenschaft und Forschung (BMBWF) (2019). *Digi.check: Nachweis digitaler Kompetenzen*. BMBWF. https://www.bmbwf.gv.at/Themen/schule/zrp/dibi/dgb/digicheck.html

Bundesministerium für Bildung, Wissenschaft und Forschung (BMBWF) (n. d.). *Digitale Grundbildung. Pflichtgegenstand im Schuljahr 2022/23 in der Sekundarstufe I – Lehrplan verordnet*. BMBWF. https://www.bmbwf.gv.at/Themen/schule/zrp/dibi/dgb.html

Bundesministerium für Bildung, Wissenschaft und Forschung (BMBWF) (2023a). *Masterplan für die Digitalisierung im Bildungswesen*. BMBWF. https://www.bmbwf.gv.at/Themen/schule/zrp/dibi/mp.html

Bundesministerium für Bildung, Wissenschaft und Forschung (BMBWF) (2023b). *Lehrplan der Volksschule*. Rechtsinformationssystem des Bundes (RIS). https://www.ris.bka.gv.at/Dokumente/BgblAuth/BGBLA_2023_II_1/Anlagen_0001_CE7F0AA2_A925_4A4D_8C3C_355D12BD22D1.pdfsig

Bundesministerium für Digitalisierung und Wirtschaftsstandort (BMDW) (2021). *Digitales Kompetenzmodell für Österreich: DigComp 2.2 AT*. Bundesministerium für Digitalisierung und Wirtschaftsstandort.

Brandhofer, G., Baumgartner, P., Ebner, M., Köberer, N., Trültzsch-Wijnen, C. & Wiesner, C. (2019). Bildung im Zeitalter der Digitalisierung. In S. Breit, F. Eder, K. Krainer, C. Schreiner, A. Seel & C. Spiel (Eds.), *Nationaler Bildungsbericht Österreich 2018. Band 2. Fokussierte Analysen und Zukunftsperspektiven für das Bildungswesen* (S. 307–362). Leykam.

Bruneforth, M., Chabera, B., Vogtenhuber, S. & Lassnigg, L. (2015). *OECD Review of Policies to Improve the Effectiveness of Resource Use in Schools: Country Background Report for Austria*. OECD Education.

Bruneforth, M., Lassnig, L., Vogtenhuber, S., Schreiner, C. & Breit, S. (eds.) (2016). *Nationaler Bildungsbericht Österreich 2015, Band 1. Das Schulsystem im Spiegel von Daten und Indikatoren [National Education Report Austria 2015. The School System Mirrored in Data and Indicators].* Leykam.

Council of the European Union (2018). *Council Recommendation on key competences for lifelong learning. Official Journal of the European Union*. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018H0604(01)&from=EN

Delors, J. (1996). *Learning: The treasure within*. UNESCO Publishing.

Digitale Schule (2020a). *8-Punkte-Plan. Ausbau der schulischen Basis-IT-Infrastruktur.* Digitale Schule. https://digitaleschule.gv.at/ausbau-der-schulischen-basis-it-infrastruktur/

Digitale Schule. (2020b). *8-Punkte-Plan. Ziele.* Digitale Schule. https://digitaleschule.gv.at/ziele/

eEducation Austria (n. d.). *eEducation Austria – Digitale Bildung für alle*. eEducation. https://eeducation.at/

eEducation Austria. (n. d.). *eEducation Badges. Qualifizierung: Badges für alle Schultypen*. eEducation. https://eeducation.at/community/eeducation-badges

European Agency for Special Needs and Inclusive Education. (2022). *Inclusive Digital Education* (H. Weber, A. Elsner, D. Wolf, M. Rohs and M. Turner-Cmuchal, eds.). https://www.european-agency.org/sites/default/files/Inclusive_Digital_Education.pdf

European Commission/EACEA/Eurydice (2019). *Digital Education at School in Europe. Eurydice Report*. Publications Office of the European Union.

Flick, U. (2014). *An introduction to qualitative research*. Oaks: Sage.

Freed, G. & Rothberg, M. (2006). *Accessible Digital Media Guidelines: Disabilities, Functional Limitations and Accessibility Tips.* WGBH Educational Foundation. https://www.wgbh.org/foundation/ncam/guidelines/accessible-digital-media-guidelines

König, J., Buchholtz, C. & Dohmen, D. (2015). Analyse von schriftlichen Unterrichtsplanungen: Empirische Befunde zur didaktischen Adaptivität als Aspekt der Planungskompetenz angehender Lehrkräfte. An analysis of written lesson plans to examine pedagogical adaptivity in the planning competences of trainee teachers. *Zeitschrift für Erziehungswissenschaft*, 18, 375–404. https://doi.org/10.1007/s11618-015-0625-7

Kurth, J. A., Lyon, K. J. & Shogren, K. A. (2015). Supporting Students With Severe Disabilities in Inclusive Schools: A Descriptive Account From Schools Implementing Inclusive Practices. *Research and Practice for Persons with Severe Disabilities*, 40(4), 261–274. https://doi.org/10.1177/1540796915594160

Luciak, M. (2008). Education of Ethnic Minorities and Migrants in Austria. In G. Wan (Eds.), *The Education of Diverse Student Population: A Global Perspective* (pp. 45–64). Springer.

Luciak, M. & Biewer, G. (2011). Equity and Inclusive Education in Austria: A Comparative Analysis. In A. Artiles, E. Kozleski & F. Waitoller (Eds.), *Inclusive Education: Examining Equity of Five Continents* (pp. 17–44). Harvard Education Press.

Nusche, D., Shewbridge, C. & Lamhauge Rasmussen, C. (2009). *OECD-Länderprüfungen Migration und Bildung. Österreich [OECD Reviews of Migrant Education. Austria].* OECD.

Partnership for 21st Century Skills (P21). (2002). *Connecting the 4 Cs of 21st Century Education (With a 5th C!).* Power School. https://www.powerschool.com/blog/connecting-the-4-c-s-of-21st-century-education-with-a-5th-c/

Puentedura, R. R. (2006). *Transformation, technology, and education in the state of Maine.* Hippasus. http://www.hippasus.com/rrpweblog/archives/2006_11.html

Puentedura, R. R. (2013). *SAMR: Moving from enhancement to transformation*. Hippasus. http://www.hippasus.com/rrpweblog/archives/000095.html

Punie, Y. & Brecko, B. (Eds.), Ferrari, A. (2013). *DIGCOMP: A Framework for Developing and Understanding Digital Competence in Europe*. Publications Office of the European Union.

Riepl, A. & Steinkogler, W. (2021). Schulen im digitalen Wandel begleiten – am Beispiel von eEducation Austria. In G. Brägger & H. G. Rolff (Eds.), *Handbuch. Lernen mit digitalen Medien* (S. 189–206). Beltz.

Schratz, M. & Weiser, B. (2002). Dimensionen für die Entwicklung der Qualität von Unterricht. *Journal für Schulentwicklung,* 4, 36–47.

Specht, W., Seel, A., Stanzel-Tischler, E. & Wohlhart, D. (2007). *Individual Support within the Austrian Education System. Strategies for the Development of Quality in Special Needs Education.* Bundesinstitut für Bildungsforschung, Innovation und Entwicklung des Bildungswesens.

Statistik Austria. (2022). *Schülerinnen und Schüler mit sonderpädagogischen Förderbedarf an allgemein bildende Pflichtschulen 2020/21.* Statistik Austria. https://www.statistik.at/statistiken/bevoelkerung-und-soziales/bildung/schulbesuch/schuelerinnen