

Analysis 2 – Curriculum readiness for teacher training

Upper Austria



„Virtual Reality for Education Network" (VReduNet) is a project of the INTERREG VA Austria-Czech Republic program (Interreg ATCZ256).



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Introductory background information about the analysis

This analysis is part of the work mapping package (T2) according to the project plan:

The goal of the job mapping package is to create detailed analyzes that reflect the current situation regarding the use and readiness of people or institutions in the field of augmented and virtual reality. These are educational institutions and further education institutions, as well as institutions that train future teachers and small and medium-sized enterprises. A total of six regional analyzes are prepared on the Austrian and Czech sides, which are then compared with each other in three further comparative analyses.

These analyzes are carried out as part of activity T2.1, with the second analysis, according to the project plan, focusing on:

T2.1 Regional analyzes

3 regional analyzes will be developed:

2. Analysis of the current readiness of (further) education plans, programs for the introduction of new technologies with a focus on VR at the level of universities that train future or existing pedagogues.

For this analysis, the partners agreed on the chapters to be processed.



Description of the functioning of the pedagogical education system. How to become a teacher?

In Austria, teacher training takes place at public universities and pedagogical colleges. Until a few years ago, these institutions were subordinated to various ministries. Pedagogical higher schools were subordinated to the Ministry of Education, which is also responsible for schools, while universities were subordinated to the Ministry of Science.

Teacher training has been fundamentally reformed in recent years since 2009 as part of the "new teacher training" process (PädagogInnenbildung NEU ¹).

The " PädagogInnenbildung NEU" initiative was also important because there is an acute need for more teaching staff in Austria. Another goal was to standardize and unify the education of all pedagogues based on the Bologna structure. In addition, the process should ensure that the new system offers a high degree of permeability for new teachers and offers the possibility of combined higher education, especially master's. Thanks to this initiative, the cooperation between pedagogical colleges and universities, which did not take place until now, was also accelerated, and thus the alignment of courses, teaching, centers of interest and study plans was made possible.

Education was centrally reorganized and education that previously took place separately in universities or pedagogical colleges was standardized and merged into clusters.

There are a total of four different networks for teacher education (Entwicklungsverbünde) (West, Central, Southeast, Northeast). Within these collaborative networks (also called clusters), university teaching schools and universities offer new teacher training programs at tertiary level in close cooperation with each other ².

Institution for teacher education in Upper Austria

Relevant for Upper Austria is the Network Center for Teacher Training (see also here <https://www.lehrerin-werden.at/>), which consists of the following institutions:

- Private Anton Bruckner University
- Johannes Kepler University in Linz
- Private university of pedagogy, Diocese of Linz
- Private Catholic University, Linz
- Edith Stein Church Pedagogical University
- University of Pedagogy in Upper Austria
- Zweig College of Education , Salzburg
- Paris Lodron University in Salzburg
- University of Art and Industrial Design, Linz
- Mozarteum University , Salzburg

In this cluster, the main providers of teacher education and further education are the following institutions:

- Private university of pedagogy, Diocese of Linz
- University of Pedagogy in Upper Austria
- Zweig College of Education , Salzburg

¹ <https://www.bmbwf.gv.at/Themen/schule/fpp/aJCU/pbneu.html>

² <https://studyinaustria.at/en/study/institutions/university-colleges-of-teacher-education>



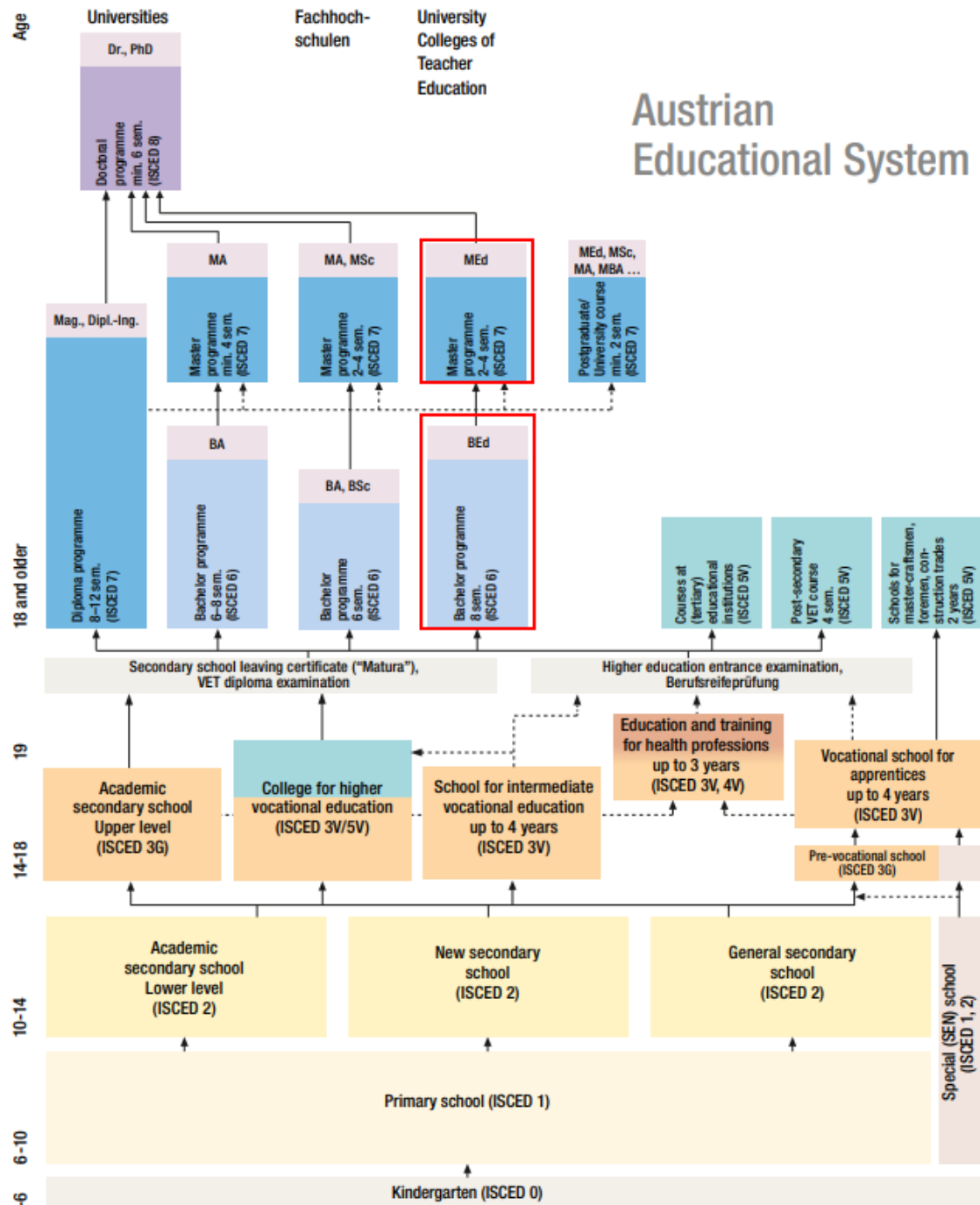
Teachers of general education subjects at the 2nd level of elementary schools are now being educated in teacher's courses at universities and higher education schools.

Teacher courses for both primary and secondary levels of vocational schools take place exclusively at higher pedagogic schools.

In addition, the structure of teacher education has changed and now consists of a four-year bachelor's degree, which can be followed by a master's degree of at least one or two years ³:

³Image source and further information: https://www.bmbwf.gv.at/dam/jcr:652bbca0-b5a9-4bd8-a283-f969149d2486/bildungssystemgrafik_2018e.pdf

Federal Ministry
Republic of Austria
Education, Science
and Research



How are study plans and accreditations created?

Curriculum for the Bachelor of Secondary Education (General Education) and Curriculum for the Master of Secondary Education (General Education)

The curricula of bachelor's and master's programs are developed, coordinated and implemented in the relevant cluster of universities or educational institutions. This process takes several years because the curricula of all subjects and all studies must be coordinated centrally within these institutions.

The legal basis of the curriculum is the federal laws, which determine the scope and scope, as well as the implementation and implementation of the study.

Specifically, the legal basis for the bachelor's degree in teaching for secondary schools (general education)⁴ and for the master's degree in teaching for secondary schools (general education)⁵ are the following laws and study regulations of decrees based on these laws in the currently valid wording:

- Bundesgesetz über die Organisation of Universities and ihre Studien (Federal Act on the Organization of Universities and Their Studies) (UG 2002)
- Hochschulgesetz (Higher Education Act) (HG 2005)
- Privatuniversitätengesetz (Private Universities Act) (PUG)
- Hochschul-Qualitätssicherungsgesetz (Higher Education Quality Assurance Act) (HS-QSG)
- Dienstrechts-Novelle 2013 – Pädagogischer Dienst (Amendment to the Service Act 2013 – Teaching Service)

The implementation is also regulated by law: The study is established and implemented jointly in the development association "Network Center for Teacher Education" with all participating institutions in accordance with § 54e UG and § 39b HG.

How can they be modified, who can do so?

Therefore, changes in the curriculum can only be made in accordance with the relevant applicable legislation and in coordination with all institutions represented in the cluster(s) and approved by the relevant ministry.

⁴ https://www.lehrerin-werden.at/fileadmin/user_upload/pdf/Bachelorstudium_Lehramt_Allgemeinbildung.pdf

⁵ https://www.lehrerin-werden.at/fileadmin/user_upload/pdf/Masterstudium_Lehramt_Allgemeinbildung.pdf



Do the current curricula of future educators already contain some elements of virtual and augmented reality?

These curricula describe very precisely the relevant subjects, the relevant modules, the objectives, the subjects and examinations they contain, as well as the prerequisites for participation in all subjects taught during the course of study.

The undergraduate curriculum ⁶ does not yet contain any reference to virtual or augmented reality.

description of the subject media design (Mediengestaltung ; p. 380 ff.) in which "virtuality and immersion" are mentioned. However, media design is offered in special types of schools with a focus on media in the curriculum.

The terms virtual reality or augmented reality do not even appear in the Master's curriculum ⁷. Virtual spaces (... "presentation in real and virtual spaces", p. 170) can again be found as a term in the subject of media design.

In general, it should be noted that the names of technologies are rarely found in the curriculum. Taking the bachelor's curriculum as an example, the word "tablet" or "notebook" does not appear in it at all, the word "computer" is mentioned 28 times and the name "new media" occurs 24 times, the term "new technologies" occurs twice.

More specifically, these concepts are mentioned in the descriptions of the following curricula:

- History and social sciences / Political education
- Design/Industrial Art
- IT and IT management
- Music
- Instrumental music education
- Mathematics
- Media design
- Inclusive education/focus on the disadvantaged
- English
- Nutrition and household

Now it may seem surprising why there are so few technological or technological terms in teacher education curricula.

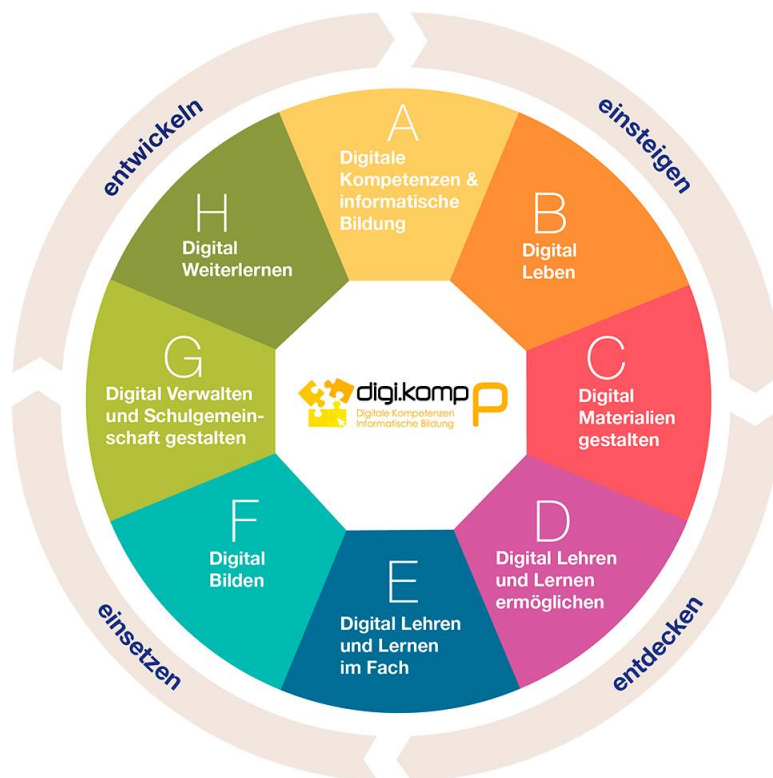
⁶ https://www.lehrerin-werden.at/fileadmin/user_upload/pdf/Bachelorstudium_Lehramt_Allgemeinbildung.pdf

⁷ https://www.lehrerin-werden.at/fileadmin/user_upload/pdf/Masterstudium_Lehramt_Allgemeinbildung.pdf

Competence model digi.kompP

It is necessary to know that in Austria there is a separate concept of digital competences for educators, namely "digi.kompP⁸⁹". This digital competence model was developed in the first version in 2016 and the second version was further developed in 2019.

digi.kompP – DIGITALE KOMPETENZEN FÜR PÄDAGOG:INNEN



A
Digitale Kompetenz
und informatische
Bildung (digi.komp12)

B
Leben, Lehren und
Lernen im Zeichen der
Digitalität; Fragen der
Technik-Ethik; Medien-
bildung und -biografie;
Barrierefreiheit

C
Gestalten, Verändern
und Veröffentlichen
von Materialien für den
Unterricht; Werk-
nutzungs- und
Urheberrecht

D
Planen, Durchführen
und Evaluieren von
Lehr- und Lernprozessen
mit digitalen Medien und
Lernumgebungen;
Formative und
Summative Beurteilung

E
Fachspezifische
Nutzung von digitalen
Medien, Software und
digitalem Content

F
Förderung der digitalen
Kompetenzen von
Lernenden

G
Effiziente und
verantwortungsbewusste
digitale Klassen- und
Schulverwaltung;
Kommunikation und
Kollaboration in der
Schulgemeinschaft

H
Lebenslanges Lernen
(LLL): Fort- und Wei-
terbildung mit bzw. zu
digitalen Medien

Tabelle 1: Übersicht digi.kompP



Lizenz Inhalt: CC BY-SA 4.0 | Lizenz Grafik und Illustrationen: confici CC BY-NC-ND
Version 1.0, Stand: November 2019
Onlinecampus Virtuelle PH, Thomas Alva Edison-Straße 1, 7000 Eisenstadt, www.virtuelle-ph.at

Image source: https://www.virtuelle-ph.at/wp-content/uploads/2020/02/Grafik_Gesamt-web.png

⁸ <https://www.virtuelle-ph.at/digikomp/>

⁹ https://www.virtuelle-ph.at/wp-content/uploads/2021/04/Grafik-und-Deskriptoren_Langfassung_adapt-2021.pdf



This competency model for educators is based on national and international models. It is a system for the self-evaluation of the continuous professional development of pedagogues and is also used to categorize further education events in the field of digital competences at teacher training universities.

This competency model "digi.kompP" is mentioned 143 times in the curriculum for undergraduate students, which means that this competency model is already used in a wide range of professional education courses.

In addition, the digi.kompP competency model is mentioned 54 times in the master's curriculum.

The competence model "digi.kompP" for educators consists of 8 sub-areas:

- **Category A (= digi.komp 12) – Digital skills and education in the field of IT**
This subfield is the basis for starting education at a university of education, specifically the digi.komp 12 competency model (see <https://digikomp.at/?id=585>), which must be mastered at universities.
- **Category B – Digital life**
Life, teaching and learning in the sign of digitality ; Technical ethics issues; Media education and biography; Accessibility
- **Category C - Creation of digital materials**
Creation, editing and publishing of teaching materials; Right of Use and Copyright
- **Category D - Enabling digital teaching and learning**
Planning, implementation and evaluation of teaching and learning processes using digital media and learning environments; formative and summative assessment
- **Category E - Digital teaching and learning in specialist areas**
Specific use of digital media, software and digital content
- **Category F – Digital education**
Promoting students' digital skills
- **Category G – Digital management and formation of the school community**
Effective and responsible digital classroom and school management; communication and cooperation in the school community
- **Category H - Further digital learning**
Lifelong learning (LLL): Further and advanced learning with or on digital media

If we now look more closely at the model of digital competences for teachers (see https://www.virtuelle-ph.at/wp-content/uploads/2021/04/Grafik-und-Deskriptoren_Langfassung_adapt-2021.pdf), however, again does not use many technical terms: virtual and augmented reality, as well as tablet and laptop, we would search in vain, computers are mentioned three times.

Here too, neutral formulations such as digital media, digital tools, software, etc. were chosen, which describe the competences in such a way that they can be used independently of technology.

Virtual or augmented reality can be interpreted in this model in several categories ¹⁰:

Taking category D "Enabling digital teaching and learning" as an example, item D.13 (page 14) ("I can search for or select new applications and software for teaching" or "use them in teaching" and "think critically") can clearly be used when working with virtual or augmented reality:

Kategorie D - Digital Lehren und Lernen Ermöglichen

Planen, Durchführen und Evaluieren von Lehr- und Lernprozessen mit digitalen Medien und Lernumgebungen;
Formative und Summative Beurteilung




Einsteigen	Entdecken	Einsetzen	Entwickeln
...			
Ich kann neue Applikationen und Software für den Unterricht suchen.	Ich kann neue Applikationen und Software für Unterricht auswählen.	Ich kann neue Applikationen und Software im Unterricht einsetzen.	Ich kann neue Applikationen und Software im Unterricht kritisch reflektieren.
D.13.1.	D.13.2.	D.13.3.	D.13.4.

Category E "Digital teaching and learning in professional areas" also fits very well here, for example competences E.7 and E.9 (p. 17) with basic skills such as "I can find/select new applications for teaching and learning", which extend to "I can try/use new teaching and learning applications" or "I can learn to use/implement new teaching and learning applications" and finally end with the competency "I can use/adapt new teaching and learning applications and evaluate their strengths and weaknesses":

Kategorie E - Digital Lehren und Lernen im Fachbereich

Fachspezifische Nutzung von digitalen Medien, Software und digitalem Content




Einsteigen	Entdecken	Einsetzen	Entwickeln
...			
Ich kann für mein Unterrichtsfach passende Applikationen auswählen.	Ich kann für mein Unterrichtsfach passende Applikationen nutzen.	Ich kann Applikationen zielorientiert in meinem Unterrichtsfach implementieren.	Ich kann Applikationen zielorientiert für mein Unterrichtsfach anpassen, bewerten und Empfehlungen abgeben.
E.7.1.	E.7.2.	E.7.3.	E.7.4.
...			
Ich kann neue Applikationen zum Lehren und Lernen finden.	Ich kann neue Applikationen zum Lehren und Lernen ausprobieren.	Ich kann neue Applikationen zum Lehren und Lernen erlernen.	Ich kann neue Applikationen zum Lehren und Lernen in ihren Stärken und Schwächen bewerten.
E.9.1.	E.9.2.	E.9.3.	E.9.4.

¹⁰ https://www.virtuelle-ph.at/wp-content/uploads/2021/04/Grafik-und-Deskriptoren_Langfassung_adapt-2021.pdf

In addition, AR/VR fits very well into Section D.12 (page 18), where current trends and developments in media-based teaching and learning for self-directed learning are identified, described, adapted and evaluated:

Ich kann aktuelle Trends und Entwicklungen zum mediengestützten Lehren und Lernen identifizieren. E.12.1.	Ich kann aktuelle Trends und Entwicklungen zum mediengestützten Lehren und Lernen im eigenen Unterrichtsfach beschreiben. E.12.2.	Ich kann aktuelle Trends und Entwicklungen zum mediengestützten Lehren und Lernen für meine Lehrtätigkeit anpassen. E.12.3.	Ich kann aktuelle Trends und Entwicklungen zum mediengestützten Lehren und Lernen evaluieren. E.12.4.
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Furthermore, in category H "Further digital education" you will find corresponding formulations of competences, e.g. in point H.11 "I can search for and find meaningful and beneficial content of software and media for educational or didactic purposes or evaluate or reflect on it independently and in accordance with the law or use".

Kategorie H - Digital Weiterlernen

Lebenslanges Lernen (LLL): Fort- und Weiterbildung mit bzw. zu digitalen Medien



Ich kann für pädagogische bzw. didaktische Zwecke sinnvollen und förderlichen Content, Software und Medien suchen, und finden. H.11.1.	Ich kann für pädagogische bzw. didaktische Zwecke sinnvollen und förderlichen Content, Software und Medien suchen, finden und bewerten. H.11.2.	Ich kann für pädagogische bzw. didaktische Zwecke sinnvollen und förderlichen Content, Software und Medien suchen, finden, bewerten und reflektieren. H.11.3.	Ich kann für pädagogische bzw. didaktische Zwecke sinnvollen und förderlichen Content, Software und Medien suchen, finden, bewerten, reflektieren, (rechtskonform) verwenden bzw. selbständig verwenden lernen. H.11.4.
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What would be a possible procedure for the eventual implementation of VR/AR technology into the curriculum?

Currently, the terms virtual reality or augmented reality are not used in the curriculum. At most, approaches can be noted in the special subject of media design, which is, however, implemented only in special types of schools. As the technologies are described very vaguely and openly in the documents above, VR and AR technologies could in principle be used and delivered in any course already.

Is there a possibility of more systematic training of current teachers in the field of VR/AR? (DVPP)

Given that the current curriculum and the closely related competence model "digi.kompP" already allow the use of all kinds of technologies - and thus the doors are open to VR or AR from the curriculum side - there is no need to make corresponding adjustments to the curriculum.

For this reason, it was investigated whether there are specific courses with information on the use and use of VR/AR as teaching or study content:

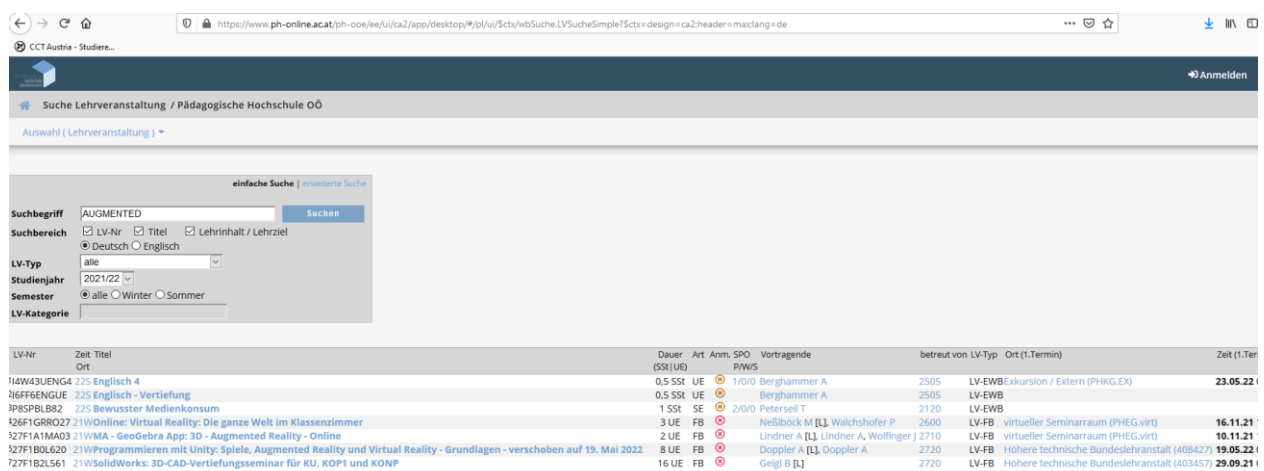
A survey of VR/AR teacher education courses at universities

The curriculum is the framework for the courses in which future teachers will be educated.

The exact courses and their content are stored in the online database "PH online" (<https://www.ph-online.ac.at/>), which is used by every college of education.

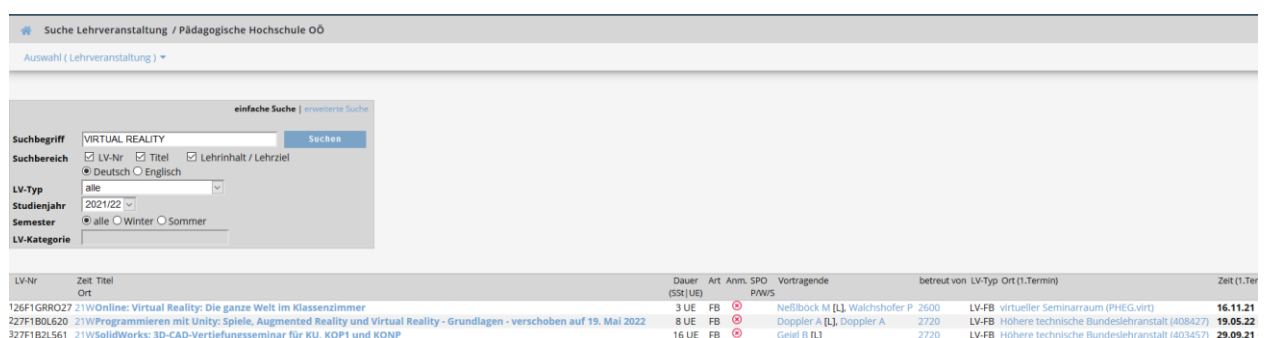
We searched this database to see if the terms "virtual reality" or "augmented reality" currently appear in the courses.

In the current academic year 2021/2022, three introductory education events and four advanced teacher education events containing the word "extended" were found at the University of Education in Upper Austria (<https://www.ph-online.ac.at/ph-ooe/>):



LV-Nr	Zeit	Titel	Ort	Dauer (SS/UE)	Art	Anm.	SPO	Vortragende	betreut von	LV-Typ	Ort (1.Termin)	Zeit (1.Termin)
11W43UENG4	225	Englisch 4		0,5 SS/1 UE	UE		1/0/0	Berghammer A	2505	LV-EWB	Exkursion / Extern (PHKG. EX)	23.05.22
16FF6ENGUE	225	Englisch - Vertiefung		0,5 SS/1 UE	UE			Berghammer A	2505	LV-EWB		
1P8PBLB82	225	Bewusster Medienkonsum		1 SS/1 SE	SE		2/0/0	Petersell T	2120	LV-EWB		
126F1GR027	21W	Online: Virtual Reality: Die ganze Welt im Klassenzimmer		3 UE	FB			Neßböck M [L], Walchshofer P	2600	LV-FB	virtueller Seminarraum (PHEG.virt)	16.11.21
327F1A1MA03	21W	MA - GeoGebra App: 3D - Augmented Reality - Online		2 UE	FB			Lindner A [L], Lindner A, Wolfinger J	2710	LV-FB	virtueller Seminarraum (PHEG.virt)	10.11.21
327F1B0L620	21W	Programmieren mit Unity: Spiele, Augmented Reality und Virtual Reality - Grundlagen - verschoben auf 19. Mai 2022		8 UE	FB			Doppler A [L], Doppler A	2720	LV-FB	Höhere technische Bundeslehranstalt (408427)	19.05.22
327F1B2L561	21W	SolidWorks: 3D-CAD-Vertiefungsseminar für KU, KOP1 und KONP		16 UE	FB			Geigl B [L]	2720	LV-FB	Höhere technische Bundeslehranstalt (403457)	29.09.21

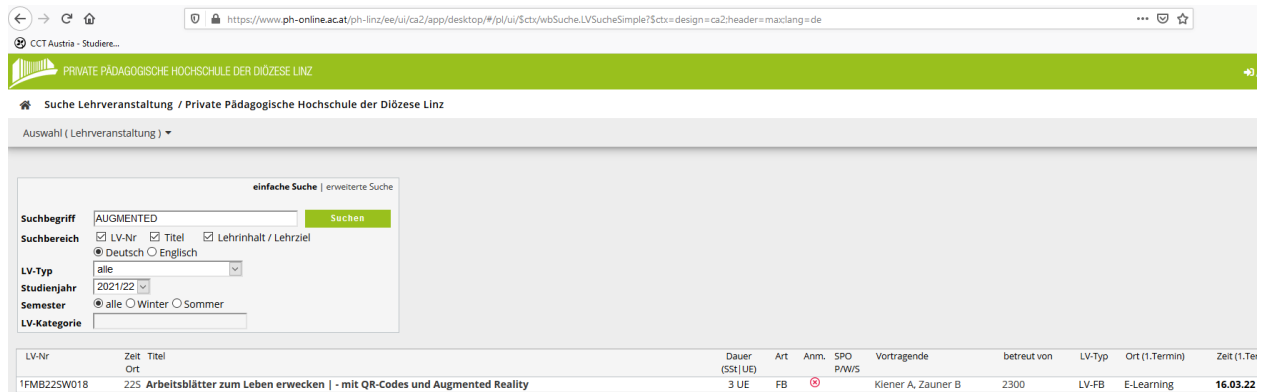
All three introductory trainings were intended for future English teachers. Four in-service teacher training courses were intended for teachers of higher vocational schools (2), focused on mathematics (1), or did not concern any specific subject at all (1).



LV-Nr	Zeit	Titel	Ort	Dauer (SS/UE)	Art	Anm.	SPO	Vortragende	betreut von	LV-Typ	Ort (1.Termin)	Zeit (1.Termin)
126F1GR027	21W	Online: Virtual Reality: Die ganze Welt im Klassenzimmer		3 UE	FB			Neßböck M [L], Walchshofer P	2600	LV-FB	virtueller Seminarraum (PHEG.virt)	16.11.21
327F1B0L620	21W	Programmieren mit Unity: Spiele, Augmented Reality und Virtual Reality - Grundlagen - verschoben auf 19. Mai 2022		8 UE	FB			Doppler A [L], Doppler A	2720	LV-FB	Höhere technische Bundeslehranstalt (408427)	19.05.22
327F1B2L561	21W	SolidWorks: 3D-CAD-Vertiefungsseminar für KU, KOP1 und KONP		16 UE	FB			Geigl B [L]	2720	LV-FB	Höhere technische Bundeslehranstalt (403457)	29.09.21

Searching for "virtual reality" will show three advanced teacher courses that were already part of the search results for "advanced".

When searching the database of the courses of the Private University of Pedagogy, Diocese of Linz (<https://www.ph-online.ac.at/ph-linz>), only one advanced teacher education course containing the word "advanced" was found for the current academic year:



Suche Lehrveranstaltung / Private Pädagogische Hochschule der Diözese Linz

Auswahl (Lehrveranstaltung) ▾

Suchbegriff: AUGMENTED

Suchbereich: ☒ LV-Nr ☒ Titel ☒ Lehrinhalt / Lehrziel

☒ Deutsch ☐ Englisch

LV-Typ: alle

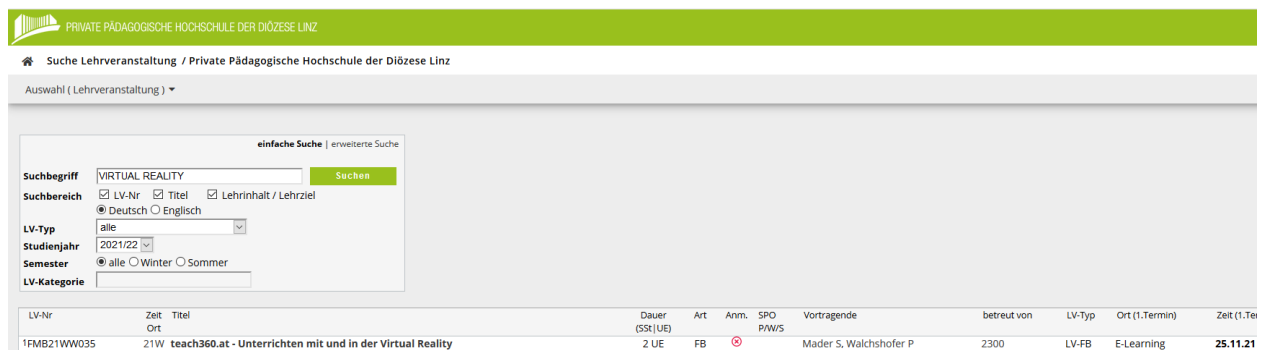
Studienjahr: 2021/22

Semester: ☒ alle ☐ Winter ☐ Sommer

LV-Kategorie:

LV-Nr	Zeit Ort	Titel	Dauer (SS/UE)	Art	Anm.	SPO P/W/S	Vortragende	betreut von	LV-Typ	Ort (1.Termin)	Zeit (1.Termin)
1FMB22SW018	225	Arbeitsblätter zum Leben erwecken - mit QR-Codes und Augmented Reality	3 UE	FB			Kiener A, Zauner B	2300	LV-FB	E-Learning	16.03.22

A search for the term "virtual reality" found another continuing education course:



Suche Lehrveranstaltung / Private Pädagogische Hochschule der Diözese Linz

Auswahl (Lehrveranstaltung) ▾

Suchbegriff: VIRTUAL REALITY

Suchbereich: ☒ LV-Nr ☒ Titel ☒ Lehrinhalt / Lehrziel

☒ Deutsch ☐ Englisch

LV-Typ: alle

Studienjahr: 2021/22

Semester: ☒ alle ☐ Winter ☐ Sommer

LV-Kategorie:

LV-Nr	Zeit Ort	Titel	Dauer (SS/UE)	Art	Anm.	SPO P/W/S	Vortragende	betreut von	LV-Typ	Ort (1.Termin)	Zeit (1.Termin)
1FMB21WW035	21W	teach360.at - Unterrichten mit und in der Virtual Reality	2 UE	FB			Mader S, Walchshofer P	2300	LV-FB	E-Learning	25.11.21

Virtual reality and augmented reality appear very sporadically as concepts in initial or further education at teacher training colleges in Upper Austria.



Media laboratories at universities of pedagogy

It is worth mentioning that in the bachelor's curriculum ¹¹there are two hours of media laboratory in the first introductory module (see MG B 1.5 Medienlabor p. 382) and the other three hours of media laboratory (see MG B 4.2 Medienlabor II p. 383) are the subject of another specialized module. In addition, the New Media – Technology, Art, Culture module can be used for VR or AR (see MG B 5.3 New Media – Technik, Kunst, Kultur p. 383), which is intended as a pedagogical practical module.

The term media lab (medialab) indicates that innovation laboratories for greater use of digital media are offered at universities.

These labs are called educational innovation studios (see also <https://eis.eeducation.at>) and are learning labs that aim to encourage pupils, students and educators to use new media. Hardware and software are available in these labs to work on topics like Robotics, Design Thinking and Programming. The overall aim is to promote competences and skills for the 21st century.

In Upper Austria, there is a Studio for Innovation in Education (=EIS) at the University of Education in Upper Austria (see <https://ph-ooe.at/eis>). However, the topics addressed there do not include virtual and augmented reality (see <https://ph-ooe.at/eis/themen>).

<https://www.phdl.at/service/medien/medienwerkstatt/>) at the Private College of Pedagogical Diocese of Linz , which is already equipped with an Oculus Rift device that students can use (see section " Geräte serviceen " at <https://www.phdl.at/service/medien/medienwerkstatt/>).

This media workshop and the equipment available in it, including the Oculus Rift, may be used by students outside of the course after consultation with the course instructor or in agreement with the media coaches.

At the University of Pedagogy in Upper Austria, students can already gain experience with VR equipment in the media workshop.

¹¹ https://www.lehrerin-werden.at/fileadmin/user_upload/pdf/Bachelorstudium_Lehramt_Allgemeinbildung.pdf



Conclusion

The preparation and further education of teachers in Austria is organized through clusters of teacher education colleges or universities. The preparation was converted to a two-level system: first a bachelor's degree and then a master's degree. The curricula for these studies are developed by the relevant institutions that cooperate within the clusters. This curriculum development process takes several years, so changes to this curriculum are only possible through the relevant institutions and take a longer time.

In the curriculum itself, the professional terms are generally very vague and rarely mentioned, however very often reference is made to the competency model "digi.kompP", which describes the competencies that teachers should have for their profession in schools.

The digi.kompP model also mentions technologies as such - however, as the terms used are very vague, VR and AR can be interpreted in certain categories just like other technologies.

The terms augmented and virtual reality appear very rarely in the title or description of teacher training and continuing education seminars.

In addition, laboratories are available at both Upper Austrian universities where students can try out hardware and software. At the Private College of Pedagogical Diocese of Linz, this laboratory is already equipped with VR glasses that can be tried out practically - even outside of classes.